FINANCING THE PHYSICAL MARKETING ACTIVITIES OF SELECTED AGRICULTURAL COMMODITIES IN GHANA

BY

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D E C L A R A T I O N

I, Ernest Mintah, author of this thesis do hereby declare that the work presented in this thesis

"FINANCING THE PHYSICAL MARKETING ACTIVITIES OF SELECTED AGRICULTURAL COMMODITIES IN GHANA"

was done entirely by me in the Department of Agricultural Economy and Farm Management, University of Ghana, Legon, from November,1993 to February, 1997.

This work has never been presented either in whole or in part for any other degree of this University or elsewhere.

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D E D I C A T I O N

Dedicated
to
my mother
and all who cherish the word of
God.

A C K N O W L E D G E M E N T

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ABSTRACT

The mode of performance and financing of the physical activities of agricultural marketing in Ghana are examined, by studying the transportation, storage and processing of two major food-crops (maize and yam) by market operators in Accra, Kumasi and Techiman markets. The food marketing channels studied, involved intermediaries such as, farmers, village based wholesalers, itinerant and sedentary wholesalers, processors and retailers. Physical market infrastructure, and transport and storage infrastructure were inadequate or in very poor condition. Estimated transport costs, ranged between 24.0 and 83.2 percent of marketing costs, and were found to be higher for headloading and commodity haulage on poor condition roads. Storage costs also accounted for between 2.2 and 17.2 percent of marketing costs. Credit needs of yam and maize wholesalers, engaged in transportation, storage and processing, ranged between ¢707,940 and ¢746,304 per round trip or between ¢117,990 and ¢220,793 per tonne of produce.

Credit needs are higher for the wholesaler who decides to vertically integrate her marketing activities, by operating a transport facility or constructing a storage facility, though substantial gains can be obtained. Sources of finance were informal (family and friends, moneylenders, farmers, other market operators) and formal (the banks).

The inability of market operators to adequately finance their credit needs for the physical activities can be attributed in part to agricultural credit shortage. This is evident from the high interest rates charged by the highly patronized informal financial sector. The formal financial institutions, expected to provide adequate financing for market operators, are unable to do so due to: weak legal and regulatory framework; poor banking supervision and administration mechanisms; high tax regime; and low recovery performance rate, among others. Improving the mode of performance and financing of the physical activities will depend on, *Inter alia*, improvement of credit delivery mechanisms, provision of enabling environment for financial institutions, development of transport, storage and physical market infrastructure, and market information collection and dissemination.

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CHAPTER ONE

1. INTRODUCTION

1.1 An Overview of the Agricultural sector

Agriculture, including forestry, constitutes the largest sector of Ghana's economy, representing 43 percent of Gross Domestic Product (GDP), 50 percent of export earnings and about 70 percent of employment (World Bank,1993). Between 1970 and 1982 there was a persistent decline in the economy characterised primarily by declining output in all sectors of the economy, high and accelerating inflation and growing macroeconomic imbalances (ISSER,1992). This led the government of the Provisional National Defence Council (PNDC) to implement the International Monetary Fund (IMF) -World Bank adjustment programme, the Economic Recovery Programme (ERP), in April, 1983, and the Structural Adjustment Programme (SAP) in 1986 to reverse the decline and restore economic growth. The resultant effect was a real GDP annual growth rate of 7.6 percent and 5.7 percent in 1984 and 1985, respectively, and 5.3 percent in 1986 (Ewusi, 1987). Agriculture also grew a little under 4 percent in 1986 and accounted for about 60 percent of GDP (MOA,1990).

However, the performance of the agricultural sector since 1986, has been very dismal. The sector recorded a growth rate of 1.0 percent and 3.6 percent in 1987 and 1988 respectively, and a further growth of 4.2 percent was recorded in 1989. The sector, experienced a major decline in growth rate of about -2.0 percent in 1990 before rising to 4.8 percent in 1991 (ISSER,1992). During the period 1987 to 1991, the proportion of economically active population of Ghana absorbed by the Agricultural sector also declined from 51.7 percent in 1987 to 49.3 percent in 1991

(FAO,1991). Agriculture's contribution to Government earnings also declined from 26 percent to 10 percent between 1987 and 1992 (Ghana Statistical Service,1992).

In order to consolidate the gains made by the agricultural sector under the ERP and SAP, as well as reverse the poor agricultural sector performance, the Ghana Medium Term Agricultural Development Programme (MTADP,1991-2000) was developed by the Ghana Government in collaboration with the World Bank.

In the MTADP, the importance of efficiency in agricultural marketing to lower food costs is emphasised. Improving marketing efficiency, under the MTADP, is to be achieved through the provision of good roads to facilitate commodity transportation; improved handling and storage facilities; and the strengthening of the small scale agro-processing subsector to achieve economies of scale, and secure group credit, among others. In recognition of the role of finance in facilitating agricultural marketing, the programme also sought to provide an enabling environment for the efficient operation of institutions at the interphase of the formal and informal financial sectors for the purchase of productivity enhancing inputs and machinery.

In examining the prospects for efficiency in agricultural marketing and finance, then, we need to seek answers to the following major questions:(a) How are the physical activities (viz., transportation, storage and processing) of maize and yam marketing performed in Ghana? ;(b) Who performs these activities?; (c) What costs are incurred in the performance of these agricultural marketing activities? ; and (d) How are the costs financed by market operators in Ghana.?. To address the questions raised above, the present study therefore undertakes a review of food production, marketing and financing problems in Ghana, and puts into perspective the transportation, storage and processing of selected food commodities, in relation to how these activities are financed in Ghana.

The justification for the present study lies in the importance of agricultural marketing and finance, for the rapid growth of the agricultural sector, and the economy as a whole. With the exception of maize which is exported in small quantities, most of the agricultural commodities produced in Ghana are consumed domestically. In the case of plantain, there has been substantial imports from La Cote D'Ivoire to meet domestic consumption since 1995. Substantial quantities of rice are also imported annually to meet domestic consumption. Agricultural commodities surpluses, that enter the marketing system are estimated at about 60 percent for yam, and about 50 percent in the case of maize, with over 80 percent of average wage incomes being spent on food (MOA,1990). This, though not conclusive, indicates, *inter alia*, that a substantial amount of agricultural produce is available for transporting, processing, and possibly storage. In Ghana, transport cost are estimated to cover over 70 percent of the marketing margin (MOA,1990 and Ghanexim,1991). Studies into how market operators finance this activity are also, of much relevance in providing policy options for the reduction of commodity transport costs, and invariably the price of food commodities.

The Ghana Living Standard Survey (GLSS) data for 1991/92 indicates that two-thirds of Ghanaian households (average size of nine) buy some form of maize products such as "banku" and kenkey".

Studies by Nyanteng (1969 and 1972) revealed that about 62 percent of food storage is mainly at the farm level. However, the GLSS data shows that, in months preceding the maize harvest, about a third of rural households, who produced some maize in the previous season, also purchase maize. Alderman (1991) also indicates that while some seasonality exists in the sales of grain by farmers, there is less agreement on whether households with larger surpluses are more or less likely to store marketable grains for an appreciable length of time. Jones (1972) also provides evidence from studies of African markets which imply that traders do not

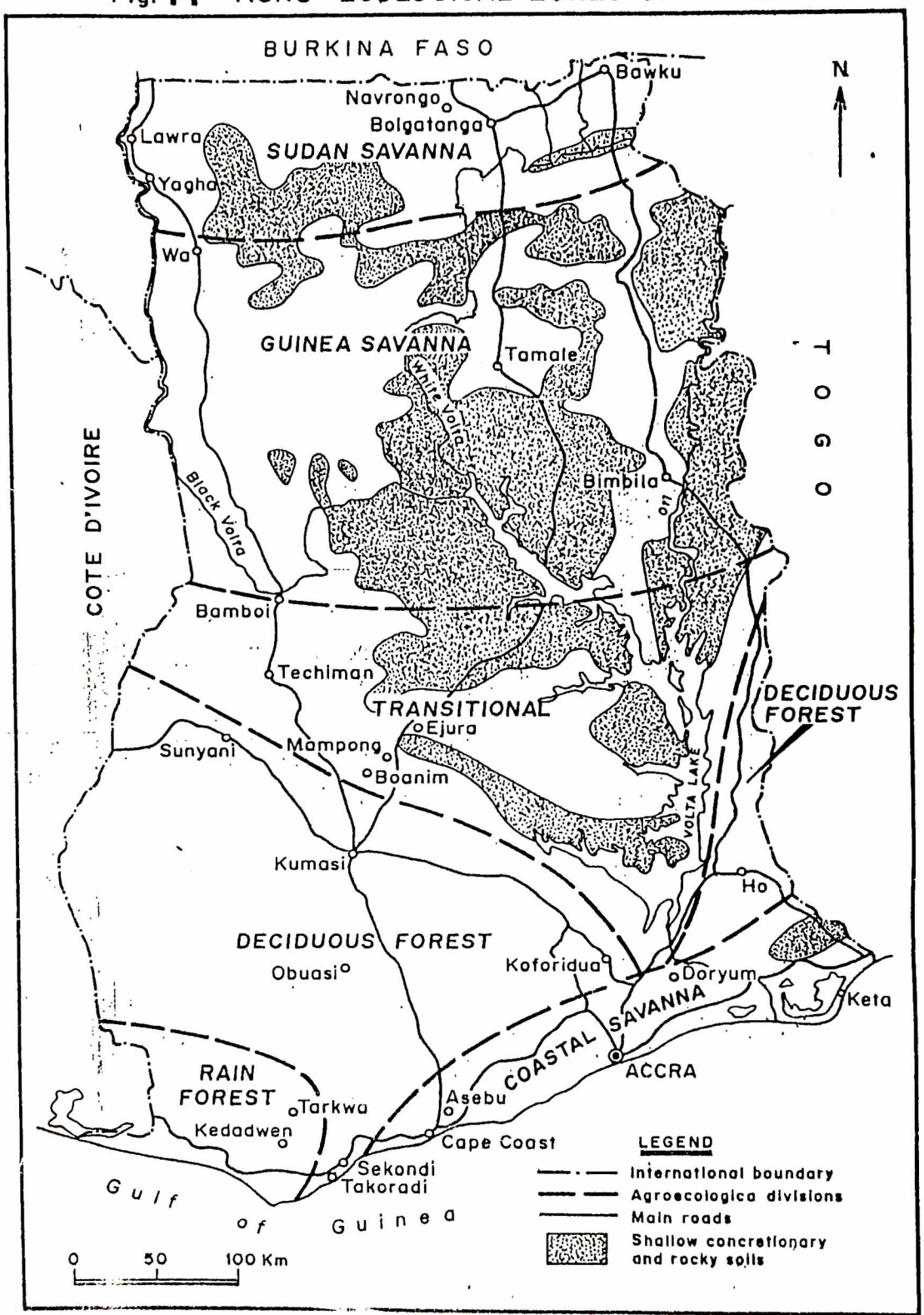
generally hold appreciable share of interseasonal storage. Who, therefore, stores the grain that is sold in the months preceding the next harvest? and whose money is tied up in the storage activity?. It is in the provision of answers to these, and other questions, that the present study is of much importance.

The perishable nature of most agricultural commodities makes it necessary for some processing to be undertaken to reduce loses, improve product quality and increase shelf life. In Ghana, virtually all agricultural commodities reach the final consumer in their raw form, with little or no processing taking place (MOA,1990). The MOA (1990) study indicated processing is normally undertaken by traditional methods which are usually not cost effective. The present study is therefore relevant since it examines the cost components of agricultural commodity processing and how these costs are financed. The study provides suggestions for strengthening the small scale agro-processing subsector.

1.2 Food Production and consumption in Ghana

Austin Associates (1990) argues that factors such as the physical environment, climate, technological adoption, economic, social and political considerations have led to the continuing change of the food production pattern of the small scale farmer in Ghana. Therefore, in order to provide a rigorous and comprehensive analysis of food production and consumption in Ghana, the physical environment of the country is discussed below, focusing particular attention on agroecological zones and rainfall patterns of the survey areas, and other parts of the country.

Fig. 1.1 AGRO-ECOLOGICAL ZONES OF GHANA



SOURCE: MOA (1990)

Ghana, a Sub-Saharan African country occupies an area of about 23.85 million square kilometres with agricultural land forming about 57 percent of the total land area of which about 18 percent is presently cultivated (MOA,1991). The country is divided into six agro-ecological zones (Figure 1.1). The survey areas, Techiman and Kumasi lie in the Forest-Savanna Transitional zone where maize and yam form part of the major crops grown. Accra, the other area of survey, lies in the Coastal Savanna zone and serves as a major consumer centre for the commodities studied, yam, maize and corn dough, among others.

The climate of Ghana is tropical. Mean annual temperatures in the study areas, Techiman and Kumasi , range between 25 - 27 ^{o}C (Badiane ***et al***,1992). With the exception of the Guinea Savannah and Sudan Savannah zones which have a unimodal rainfall pattern, the rest of the country has a bimodal rainfall pattern (Dickson and Benneh,1988). The survey areas studied have two rainy seasons and two dry seasons. The first major rainy season starts in early March and reaches its peak in June and then decreases gradually through July. The minor season rain starts in the latter part of August and reaches its peak in September-October. There is a relatively short dry period between the two rainy seasons, usually the month of August. The major dry season starts from the end of November through February. The extreme south-western part of Ghana is the wettest part of the country. Kumasi receives about 150cm, with Techiman receiving about 140cm. The bimodal rainfall distribution allows a major and minor growing season. Elsewhere, the unimodal rainfall gives a single growing season.

The difference in agroecological zones and rainfall patterns across the country, as explained above, have led to variations in farming systems and food crops produced in various parts of the country, as shown in Table 1.1. Food production in Ghana is mainly by traditional methods, with little use of improved technology. Land preparation is manual, particularly in Southern Ghana where the

common implements employed by small scale farmers are the hoe and cutlass. However, in the Guinea and Sudan Savannah zones, oxen are used for ploughing during land preparation. The influence of the physical environment, on agricultural production, is also evident in the cropping systems employed.

Table 1.1 Major Crops Grown in the Agro-ecological Zone

ZONE	Cereals	Starchy Crops	Vegetables	Tree Crops	Industrial Crops
High Rain Forest	Maize Rice	Cassava Plantain Banana Cocoyam	Okro Pepper Garden-Eggs	Citrus Coconut Oil Palm Rubber	N/A
Semi-Deciduous Forest	Maize Rice	Cassava Plantain Banana Cocoyam	Okro Pepper Garden-Eggs	Oil Palm Cocoa Citrus Coffee	N/A
Forest Savannah Transition	Maize Rice Sorghum	Cassava Plantain Cocoyam Yam	Tomato Okro Pepper Garden-Eggs	Citrus Coffee	Cotton Tobacco Kenaf Ground-Nut
Northern Savannah (Sudan & Guinea)	Maize Rice Sorghum Millet	Yam Cassava	Tomato Onion	Shea-butter	Cotton Tobacco Kenaf Ground-Nut
Coastal Savannah	Maize Rice	Cassava	Tomato Shallot	Coconut	N/A

Source: Badiane,O., V.K. Nyanteng, W.A. Seini, 1992. "Food Security, Comparative Advantages and Fertilizer Use in Ghana". International Food Policy Research Institute, USA/Institute of Statistical, Social and Economic Research (ISSER), Legon.

Agriculture, in Ghana, is predominantly on smallholder basis. There are, however, large farms and plantations particularly for tree crops such as, cocoa, cotton,

rubber, oil palm and coconut. In general, food crops and tree crops have different holdings devoted to their production.

In the High Rain Forest and Semi-Deciduous Forest zones, food crops are usually grown intercropped. The common combinations being maize intercropped with plantain and cocoyam or maize intercropped with plantain and cassava. Tree crops are usually grown as sole crops, but sometimes with any of the following cropping systems: intercropped maize/cassava or sole cropped maize/yam/legumes. In the Northern Savannah (Sudan and Guinea) zone the main cropping systems are intercropped sorghum and legumes or rain fed rice in valley bottoms (MOA,1990). Livestock also plays an important role in the farming system of the Northern Savannah zone. Like cassava, maize is produced in all the agro-ecological zones of Ghana with the areas of concentrated production around Techiman, Nkoranza, Sunyani, Kumasi, Sekyere-Dumase, Mampong, Asesewa, Swedru, Ho and Koforidua in the Semi-Deciduous Forest and Forest Savannah Transition zones. These areas, therefore, serve as net exporters of maize to areas of low maize production such as Takoradi, Cape Coast and Accra, all in the Coastal Savannah zone, as well as to other major consumer and net importing centres such as Navrongo, Bolgatanga and Bawku in the Northern (Sudan and Guinea) Savannah zones. The forest savanna transition and the northern savannah zones, therefore, serve as major consumption centres for yam in the country. The spatial separation of production centres from consumption centres imply that some movement of the commodities from the producer markets to the consumer markets is required, which involves cost and must be financed.

The distances involved in commodity transportation arising from the agro-ecological zonation of production and consumption points and the raw form in which most agricultural commodities are transported, as well as lack of storage facilities in the markets, partly accounts for fluctuations in the prices of major food crops in Ghana (MOA,1990). Alderman and Shively (1991) observed that less than half the variation in reported prices of

agricultural commodities they studied - including both reported error and unanticipated price movement - was due to seasonal movement. This, though not conclusive, lends support to the view that factors, other than seasonality, partly accounts for variations in market prices. This study does not however give detailed analyses of price fluctuations, since various studies such as Alderman and Shively (1991) and Alderman (1991),among others, analyse price fluctuations in detail.

Alderman and Shively (1991) present evidence of significant fluctuations in the average seasonal movement of prices of selected food crops. Millet was observed to peak in June and reach a low in December. The prices of maize and yam were also observed to peak in June, however, the trough occur in September and October, respectively. Cassava prices were found to show virtually no seasonal pattern.

The World Bank (1993) study, "Ghana 2000 and Beyond" indicates that such price fluctuations create considerable opportunity for arbitrage activities to smooth out price movements through trade, both domestic and international, and through storage and further processing. It again notes that the limited extent of arbitrage activities observed may reflect high transaction costs that are difficult to overcome. The relevant transaction costs, it argues, may be influenced by the limited supply of storage facilities, transport and other infrastructural bottlenecks, as well as some institutional constraints. The examination of these are, therefore, of paramount interest to the present study.

1.3 Food Marketing Problems in Ghana.

The seasonality of food production in Ghana has some implications, not only for food production and price formation but also for the performance of agricultural marketing functions in Ghana. Marketing is a process which entails a number of economic activities performed as goods and services are moved from the point of initial production to the ultimate consumer.

The economic activities performed in the marketing process include transportation, storage and processing which add place, time and form utilities to the product, respectively. These are the physical activities of the marketing process. Other activities or functions are concerned with buying and selling (exchange functions) which are important aspects of price determination, and Facilitation functions, such as, financing, grading and standardisation, market information and risk bearing. Agricultural marketing, therefore, provides a link between the producer and the consumer by moving produce from the initial point of production to the ultimate consumer, in the desired form, place and time.

The efficient performance of agricultural marketing in Ghana is however hampered by several constraints. These constraints include, *inter alia*, a relatively underdeveloped transportation and communication infrastructure, lack of storage facilities, inadequate financing and lack of market information (MOA,1990).

a. Transportation

Erbynn (1970) cites transportation at the top of the list of factors contributing to the inefficient and high-cost methods of marketing farm products. Asenso-Okyere (1985) in contributing to a symposium on: "factors contributing to high transportation costs and their effects on the economy", indicated that apart from management, transportation forms the largest component of the marketing margin and is therefore a very important factor in the determination of commodity prices.

In Ghana, the transportation problem is influenced largely by the poor condition of feeder roads, many of which become unmotorable during the rainy seasons, giving cause to transport owners to charge higher rates. In their report, "improving market infrastructure in Ghana", Asuming-Brempong and Abebrese (1993) concluded that, though no empirical support exists, it is possible that transport charges are determined largely by the level of operating expenses of commodity transporters. The relevant questions that arise are: how

does operating expenses of agricultural commodity transporters influence commodity transport costs?; and what factors actually influence transportation costs in Ghana?.

The poor road and high vehicle maintenance costs have led to much of the consumer price being taken by transportation costs (Ghanexim,1991). A study by the MOA(1990) also revealed that transportation costs accounts for about 70 percent of the marketing margin or about 50 percent of consumer's cedi. The study further revealed that the road even in areas such as Techiman,Nkoranza and Mampong Districts which produce a high proportion of the marketable surplus of food in the country are in very poor condition. Hine ***et al*** (1983) also concluded that, the poor transportation network and the long channels involved in the movement of foodcrops have caused the level of transport charges to remain high. This therefore imply rising financial requirement for the performance of the transportation function. It is therefore pertinent to ask: What networks and modes of transportation exist for movement of produce from the initial point of production to the ultimate consumer? and what sources and levels of finance are available to market operators for the performance of the transportation function?.

b. Storage

Nyanteng (1972) and Sarris (1991), among others, mention storage as a major problem of agricultural marketing in Ghana. To the extent that there is a time lag between the production and consumption of foodcrops, storage is an essential aspect of the agricultural marketing system. The storage activity is primarily concerned with making goods available at the desired time. In other words, it is the deliberate holding of goods and services from the time of production until they are needed for processing or final consumption. Alderman (1991) contends that urban consumers purchase food regularly throughout the year relying little on home storage and that some fair amount of evidence exists that rural households in Ghana, particularly, in the coastal regions, rely on markets in addition to their own production for their food supply. Preliminary findings of studies by the Ghana Grains Development Project, also show that nearly half of the maize held by

farm households is sold between March and June, indicating some appreciable level of stockholding (or storage) by farmers, in keeping with findings of Nyanteng (1969 and 1972). Jones (1972) also provides evidence from other African markets which implies that, unlike farmers, traders do not generally hold an appreciable share of inter seasonal storage.

Storage of foodcrops is, however, very expensive since it involves the locking up of capital, which has many alternative uses and therefore opportunity cost. Storage is also expensive as a result of the absence of proper facilities to prevent loss in weight and quality deterioration during storage. The study, therefore, seeks answers to the following questions: Who undertakes storage in the country?; What amount of storage is undertaken, both in quantity and time?; What costs are incurred?; and who finances the storage activity?, or rather, whose money is locked up in storage?.

c. Processing

In Ghana, little processing of food crops is done and by using less expensive traditional methods (MOA,1990). However, most agricultural products are perishable and therefore processing is required to extend the shelf life of the product. Assuming-Brempong and Abebrese (1993) contended that high capital outlay involved in the acquisition of modern processing equipment may be a hindrance to the acquisition and use of such facilities. The key questions, then, are: Who processes foodcrops?; What costs are incurred in the processing of agricultural commodities; and how do market operators finance these costs?.

1.4 Financing Agricultural Marketing and Problems

The most widely cited problem of agricultural marketing facilitation is finance (Von Pischke, 1991 and La Anyane, 1985). Financing is an important facilitating function in agricultural marketing and is closely linked to marketing as an essential aspect in the set of services needed to develop the productive potential of the rural economy. The shortage

or low levels of finance would therefore affect the efficient performance of the physical activities of agricultural marketing in Ghana. As suggested by Austin Associates (1990), lack of own operating capital and credit for marketing may have contributed to some farmers and traders from vertically integrating their marketing activities: storage, transportation and processing functions, that add value and utility to the product. The availability of adequate operating capital is however not a prerequisite for vertical integration. The cost - benefit analysis of the marketing activity should form the basis of the decision to integrate, since in the case of some marketing activities, specialization may be more beneficial

In line with Government policy to provide credit to smallholder operators in the agricultural sector, the Government in 1965 established the Agricultural Credit and Co-operative Bank by Act 286, which was amended in 1967 to rename the Bank as the Agricultural Development Bank (ADB). Over the years, however, there has been limited financing of the agricultural sector, because of the high cost of approving and supervising loans to the sector (Ewusi,1984).

In an effort to address the persistent problem of lack of own operating capital and the high interest rates charged by the informal money lending sector, the government instructed commercial banks to increase their lending to the agricultural sector. Besides ADB, the commercial banks were obliged, as a matter of policy, to lend not less than 25 percent of their loanable funds to the agricultural sector, and also at subsidised interest rates. These policies were however abolished in 1990 as part of the SAP. Another effort by Government, was the establishment of Rural Banks, in rural areas, to mobilise savings in their areas of operation and provide needed financial support for small scale farmers and rural entrepreneurs who constitute a majority of the country's population. Despite these and other efforts, the problem of inadequate financing still persists partly because income levels are low in the rural areas resulting in low savings (Steel and Aryeetey,1994).

The inability of existing lending institutions to extend sufficient finance to the sector, makes it imperative to ask the question of how market operators, engaged in the physical activities of agricultural marketing, finance these activities. That is: what sources and levels of finance are available to market operators who undertake transportation, storage and processing of agricultural commodities?.

Steel and Aryeetey (1994) contend that money lenders, a common source of informal credit throughout the developing world, rarely serve as financial intermediaries; they often lend funds from their own business activities and, where they are few or operate illegally, they are an unreliable and often expensive source of finance. However, in the view of La-Anyane (1985), despite the high and usurious interest rates in the informal sectors, the formal sector has not been able to eliminate the money lender because of the high real cost of administering formal sector loans to smallholders. Von Pischke (1991) also argues that the poor performance of formal Rural Finance Institutions (RFIs) results from the maintenance of low and uncompetitive lending rates. These bring up the following key question: what level of interest rates prevail in the informal and formal financial markets?.

While lending rates may be a problem in financing agricultural marketing, Yaron (1994) writing on "Successful rural finance institutions" also attributed the failure of agricultural lending institutions to the lack of innovative credit delivery policies and mechanisms. This is in keeping with observations made by Braverman and Guasch (1989). In connection with the perceived inability of existing formal financial institutions to adequately finance the agricultural sector, other relevant questions to ask are: what problems hamper financing of agricultural marketing in Ghana? and what policies and policy changes are required to encourage increased financing of the sub-sector by existing formal financial institutions?.

In order, to understand more fully the role and problems of the formal and informal financial sectors and the reasons for the high interest rates that reduce access of market operators to adequate financing, the study focuses on how well both formal and

informal financial institutions are performing, with particular reference to supervision, credit appraisal, delivery, monitoring and recoveries, and loan volumes, among others.

1.5 Objectives of the Study

The major objective of the study is to examine, ***inter alia***, how the physical marketing activities(transportation, storage and processing) of some selected foodcrops (yam and maize) are financed in Ghana. The specific objectives are:

1. To put into perspective the transportation, storage and processing of maize and yam in Ghana.
2. To estimate the costs and margins of performing the physical activities.
3. To examine how market operators finance the costs incurred in the transportation, storage and processing of maize and yam.
4. To examine the major aspects and problems of financing the physical activities of maize and yam marketing.

1.6 Organisation of the study

The study is organised into six chapters. Chapter two, the methodology, gives the method of data collection and analyses, as well as limitations of the study. Chapter three discusses transportation, storage and processing of maize and yam in the country.

Estimates of marketing costs and margins, and financial requirements of entrepreneurs engaged in transportation, storage and processing are provided in Chapter four. Chapter five presents an analyses of how transportation, storage and processing are financed, together with the problems of financing these activities. Conclusion and recommendations are provided in Chapter six.

CHAPTER TWO

2. METHODOLOGY

2.1 Method of Analysis

The study employs specific methods of analysis in addressing the questions raised in Chapter One.

To address the question of how the physical activities of agricultural marketing in Ghana are performed and the related costs financed, coded responses from structured questionnaires administered on a sample respondents are employed in the construction of tables of response and matrix ranking of preferences. This is undertaken with the use of the computer software: Statistical Package for Social Sciences (SPSS/PC+).

The appropriate data collection technique for any study depends on the type of information required. The Wye College (1991) report indicates that whatever the problem studied, there are at least three methods of data collection: (1) secondary data collection; (2) primary data collection, using a formal sample survey; and (3) primary data collection, using informal techniques.

Secondary data collection involves a review of existing literature and the analysis of official statistics. Primary data collection using formal sample survey is characterised by: (a) random sampling techniques used to generate a representative sample from which generalisation can be made to a wider population than that sampled; (b) the use of pre-designed questionnaires; the focus on quantitative data; and (c) the use of teams of enumerators, required because of the large scale of such surveys. Informal primary data collection techniques, however, involve variations in one or more of these elements, and can include surveys using non-random samples, case studies, semi-structured or open ended interviews or direct observations NRI (1992).

The advantages and disadvantages of the use of these data collection techniques are examined in detail by Lipton and Moore (1972) and Casely (1986). To compensate for

the short comings of one method (or technique), this study employs a combination of secondary data collection technique and primary data collection technique, involving interviews using structured questionnaires, matrix ranking of preferences and description of phenomena and observations which cannot be captured using questionnaires.

For each of the selected market operators (transporters, wholesalers, storage operators and processors), a structured questionnaire specific to that activity is administered (see Appendices). The maize and yam wholesalers questionnaire was designed with the aim of studying the mode of transportation, storage and processing of selected agricultural commodities, as well as ascertaining their costs of operation and how the costs are financed. The transporters questionnaire sought to determine their operating costs, as well as problems encountered in the transportation of food crops. Private storage operators were also interviewed to determine their costs and sources of finance. Similarly, the processors questionnaire was structured to ascertain the cost of processing and transportation of the raw (and processed) product. It also examines the mode of financing of processing and related activities.

To allow for some level of generalisation of the results, some degree of randomness is introduced in the survey, through the use of "random encounter" in the selection of respondents. Secondary data employed include publications by the Bank of Ghana, various commercial and rural banks, Price Waterhouse Associates, the Ministry of Agriculture, and existing literature in various libraries. These sources provide data on the nature and levels of financial sector operations, interest rate on lending, production areas and volumes, and estimated marketing costs, and margins, among others.

The commodities for which data were collected are maize, yam, and corn dough. Data were obtained from selected food markets in Ghana: Techiman, Kumasi and Accra markets. The justifications for the selection of these markets and commodities are presented under Sections 2.2.1 and 2.2.2.

2.2 Scope of the Study

2.2.1 Selection of Commodities

To achieve the stated objectives, the study employs three commodities in the analysis. The major food categories consist of (i) grains and cereals; (ii) starchy roots, and tubers and fruits; (iii) legumes or pulses; (iv) oil-seeds and nuts; (v) leafy vegetables and succulent fruits; (vi) fats and oils (vii) beverages; (viii) meat and (ix) food additives (Dapaah, 1989).

The food commodities selected in the present study; yam and maize (and corn dough) fall in tubers and grains categories, respectively. The importance of the use of a food commodity in the starchy roots and tubers category becomes clear when compared with other commodities. In Nigeria cereals contribute about 70 percent of the per capita consumption whereas in Ghana they contribute only 35 percent, with roots and plantain contributing about 60 percent (MOA, 1988). Although yam has 30 percent calories in wheat equivalent compared to crops like rice, wheat and maize, the price of yam (per calories content) in urban areas in Ghana is, however, two to three times higher than that of maize, and almost equal to that of rice and wheat (Dapaah, 1989). This indicates, among others, a strong preference, as well as excess demand for yam in Ghana, hence its inclusion in the present study. The water content in yam also has some implications for yam transport costs per unit. Water content in cereals is usually about 10 percent, while in root crops and tubers, such as yam, it ranges from 56 to 70 percent.

Maize is selected for the present study since about 50 percent of maize surpluses enter marketing channels in Ghana, for distribution and processing (MOA, 1990). In the case of yam and cassava, it is between 25 and 30 percent. The per capita consumption of maize is estimated as 28.7 kg., with that of other cereals averaging 57.1 kg. The per capita consumption of yam and plantain are 13.1 and 26.8 kg., respectively (MOA 1988). Maize is also produced in all the agroecological zones of Ghana.

Corn dough is also selected for the present study since it is a processed food commodity handled in large quantities in markets of southern Ghana (MOA, 1990).

2.2.2 Selection of Markets

Studies by Asuming- Brempong *et al* (1991) reveals that there are over 900 physical markets scattered throughout the country (Table 2.1), which do not include "roadside markets".

Table 2.1: Market Distribution in Ghana by Regions

Regions	No. of Markets	Percent of Total
Ashanti	261	29
Eastern	128	14
Central	114	12
Northern	97	11
Brong Ahafo	67	7
Western	60	7
Upper West	56	6
Volta	48	5
Greater Accra	43	5
Upper West	56	6
Volta	48	5
Greater Accra	43	5
Upper East	37	4
Total	*911*	*100*

Source: Asuming- Bempong, *et al*.(1991).

For the present study, markets were selected from the Greater Accra Region (Malam Ata, Kaneshie, Konkomba, and Agbogbloshie markets), Ashanti Region (Kumasi Central market) and Brong Ahafo Region (Techiman market), as indicated in Table 2.2.

These markets were selected on the basis of their importance as major assembly points for the commodities studied, as well as on the level of patronage by market operators (wholesalers, transporters, processors) and consumers, based on information provided in Asuming-Brempong *et al* (1991).

The Kaneshie, Timber, Konkomba, and Agbogbloshie market in Accra are important markets for yam and maize (Table 2.3). The Mallam Ata market is an important wholesale market

for corn dough. The Kaneshie and Mallam Ata markets in Accra, have an estimated number of 5,000 and 3,000 food traders (excluding hawkers), respectively. This accounts for about 33 percent of estimated sellers in Accra (Table 2.3).

The Kumasi Central market and the Techiman market are major agricultural commodity markets in the forest-savanna transitional zone of Ghana, with an estimated number of 15,000 and 12,000 food traders, respectively.

Table 2.2: Main Farm Commodities Traded in Markets Selected for the Survey.

Survey Area	Market	Main Farm Commodities
Accra	Kaneshie	Maize, yam, plantain, cassava
	Mallam Ata	Corndough, plantain, vegetables, cassava
	Timber	Maize, Yam
	Konkomba	Yam
	Agbogbloshe	Maize. Yam. Plantain. Vegetable
Kumasi	Kumasi-Central	Maize, Cassava, Plantain, Vegetables
Techiman	Techiman	Maize. Yam, Cassava, Plantain

Source: Asuming-Brempong, *et al*(1991) and from the survey.

Table 2.3 Market Attendance by Sellers and Days for Selected Markets

Market	Market Days/Cycle	No. of Food Traders
Kaneshie	Wed/Sat. Daily	5,000
Konkomba	Daily	250
Timber	Daily	800
Agbogbloshie	Daily	700
Mallam Ata	Saturday/Daily	3,000
Kumasi Central	Daily	15,000
Techiman	Wed/Thurs./Friday	12,000

Source: Asuming- Brempong *et al*.,(1991) and from the Survey.

The survey shows that traders who go to the Kumasi Central and Techiman markets come from as far as Accra, Takoradi, Cape Coast, Denu and Ho. The Techiman market is a

periodic market with three market days: Wednesday, Thursday and Friday, while the other markets studied are mostly daily markets (Table 2.4).

2.2.3 Selection of Respondents

Domestically produced agricultural products are marketed by a large number of small-scale private traders who are mostly women.

Selection of maize and yam wholesalers for interview was done by "random encounter" after permission had been sought from market "queen" or head responsible for the particular product. The "random encounter" technique was employed to allow for some generalization of data collected.

In the case of transporters, the questionnaire was administered on those available in the market at the time the interviews were being conducted. This category of respondents were not many in the markets visited, and as such virtually all those available were interviewed.

Storage operators for yam were not available in the markets visited. In the case of maize, a few storage operators were available in the Mallam Ata market in Accra, and in the Techiman and Kumasi Central markets. Virtually all the storage operators encountered were, therefore, interviewed in the survey.

Processors interviewed in the survey were those dealing in processed maize, corn dough. They were also selected for interview on the basis of "random encounter".

2.2.4 Administering the Questionnaires

In each of the markets visited, the queens were first contacted and interviewed, after which the market "queens" appointed one of their executives to take us (author and two helping Ministry of Food and Agriculture officials) round the market to interview the traders. In the case of transporters, most of them were interviewed in their parked vehicles, in the markets visited.

A total of 302 questionnaires, including 30 used for the pre-testing, were employed in the analysis. The composition of the respondents were, 101 maize wholesalers, 61 yam wholesalers, 38 maize storage operators, 36 maize processors and 66 maize and yam transporters.

2.3 Limitation of the study

The study was not without constraint. The major yam growing areas in the Northern Savannah zone were not covered due to the state of emergency imposed on the area, as a result of ethnic conflict between the Dagombas and Konkombas, between 1993 and 1994. Therefore, data on yam marketing between Bimbilla and Accra was obtained from market operators in the Konkomba Yam Market.

CHAPTER THREE

3.CHANNELS AND PHYSICAL ACTIVITIES OF AGRICULTURAL MARKET IN GHANA

3.1 Food Markets in Ghana

There are over 900 markets throughout the country, that deal directly in agricultural products (Assuming- Brempong, ***et al***, 1991 and Van Appeldoorn, 1970).

They consist of two basic types. The open space with stalls and stores, usually with designated positions occupied by the different food commodity dealers. In the other type, referred to as "road-side markets", traders sell only food items from nearby farms to consumers and traders travelling along such routes (Nyanteng and Van Appeldoorn, 1971).

According to Asuming-Brempong, ***et al*** (1991), most of the markets in Ghana are relatively small and undeveloped. Over 90 percent of the markets cover less than 2 hectares in size, and have neither paved floors nor well constructed stalls. Also, there are very few facilities. For example, over 70 percent of the markets have no parking space and only about 48 of the markets (5 percent) throughout the country have some form of storage facilities.

Food markets in Ghana can also be described as rural, semi-urban or urban. Austin Associates (1990) describes rural markets in Ghana as the most primitive in terms of structure and facilities available, and are characterized mostly by makeshift structures which cannot stand any rainstorm, poor sanitation, lack of good drinking water, and lack of proper demarcation among the various produce being sold.

Semi-urban markets are generally located at the district capitals. They also lack many basic facilities and services including inadequate space for loading and unloading and are, generally, poorly managed.

Urban markets are relatively well developed, with toilet facilities and good drinking water but, like the rural and semi-urban markets, they are poorly managed and highly

congested due to lack of space to expand. According to Van Appeldoorn (1970), urban markets usually function with brisk activity almost every day of the week.

In the view of Van Appeldoorn, the important distinction between urban and rural markets in Ghana appears to be that, a consumer is in a position to procure most of the necessities of life at any time he visits an urban market, whereas this could be possible only on special market days in a rural market.

Most of the food markets in Ghana are periodic, particularly those located in rural areas (Mckim,1972). Estimates from Asuming-Brempong, ***et al*** (1991) show that about 53 percent of the markets are solely periodic, 14 percent are both periodic and daily markets, and the remaining 33 percent are daily markets. Periodic markets often serve as an initial collection point for the flow of food to towns and urban centres (Eicher and Baker,1982).

Markets in Ghana, apart from being classified as wholesale and retail markets, or rural, semi-urban and urban markets, are sometimes classified by the dominant commodity traded, such as, yam market (e.g. Konkomba yam market in Accra) and maize market, among others.

3.1.1 Competitiveness and Efficiency of the Private Food Marketing System

The private food marketing system in Ghana has generally been competitive with price formation depending largely on the forces of demand and supply. Food marketing is, however, usually constrained by imperfections and inefficiencies such as too many intermediaries, barriers to entry, and exploitative pricing practices by middle men, among others (Eicher and Baker,1982).

The marketing of foodstuffs in Ghana may involve few intermediaries, as is the case of corn dough marketing or several intermediaries, as is the case of maize marketing. Some researchers argue that the long chain of intermediaries is an efficient use of resources (Bohannan and Datton, 1962 and Wilock,1978.). Other researchers, however, contend that

a long marketing chain, with many intermediaries, increases marketing cost (Nyanteng, 1969, Oteng, 1974, and Ghanexim, 1991).

Another important concern in competitiveness of food markets is barriers to entry. The private food marketing system in Ghana has generally been competitive with little or no barriers to entry. Markets in Ghana, however, have market or commodity specific "queens" who impose limited barriers to entry. Bauer (1954) observed that some barriers to entry can also stem from tribal affiliations and trader groups who regulate prices and establish conditions and fees for entry. For example, yam traders interviewed in the Techiman market said they had to pay ¢20,000 to the market queen of the Yam Traders Association before being allowed to operate in the market.

Apart from introducing some barriers to entry, these market "queens" sometimes dictate prices of the commodities. Collusive practices are often attributed to the presence of groups organised along product lines, such as the Yam Traders Association who control yam trade in Techiman. The Process of price formation is, however, through "haggling", and in most cases, both buyer and seller have a reasonably good idea of the range of prices prevailing in the market in any given period. Whetham (1972) noted that buyers and sellers are often well known to each other and that final bargains reflect degrees of kinship and social obligations as well as estimates of the equilibrium price. Most itinerant traders also employ the services of local buying agents. The buying agents have adequate information about price range of the commodity in the locality.

However since agricultural products have low inventorability and there are no proper storage systems to help control supply of a particular commodity, these market "queens" have not been very effective in determining prices. Buyers are, generally, able to dictate prices when supply is high, and lose this advantage when supply is low.

The competitiveness and efficiency of food markets in Ghana are affected by additional factors such as inadequate infrastructure, instability in supply resulting from

over dependence rainfall, lack of transportation infrastructure and inadequate market information. A review of these problems is presented in other chapters of the study.

3.2 Maize Marketing Channels

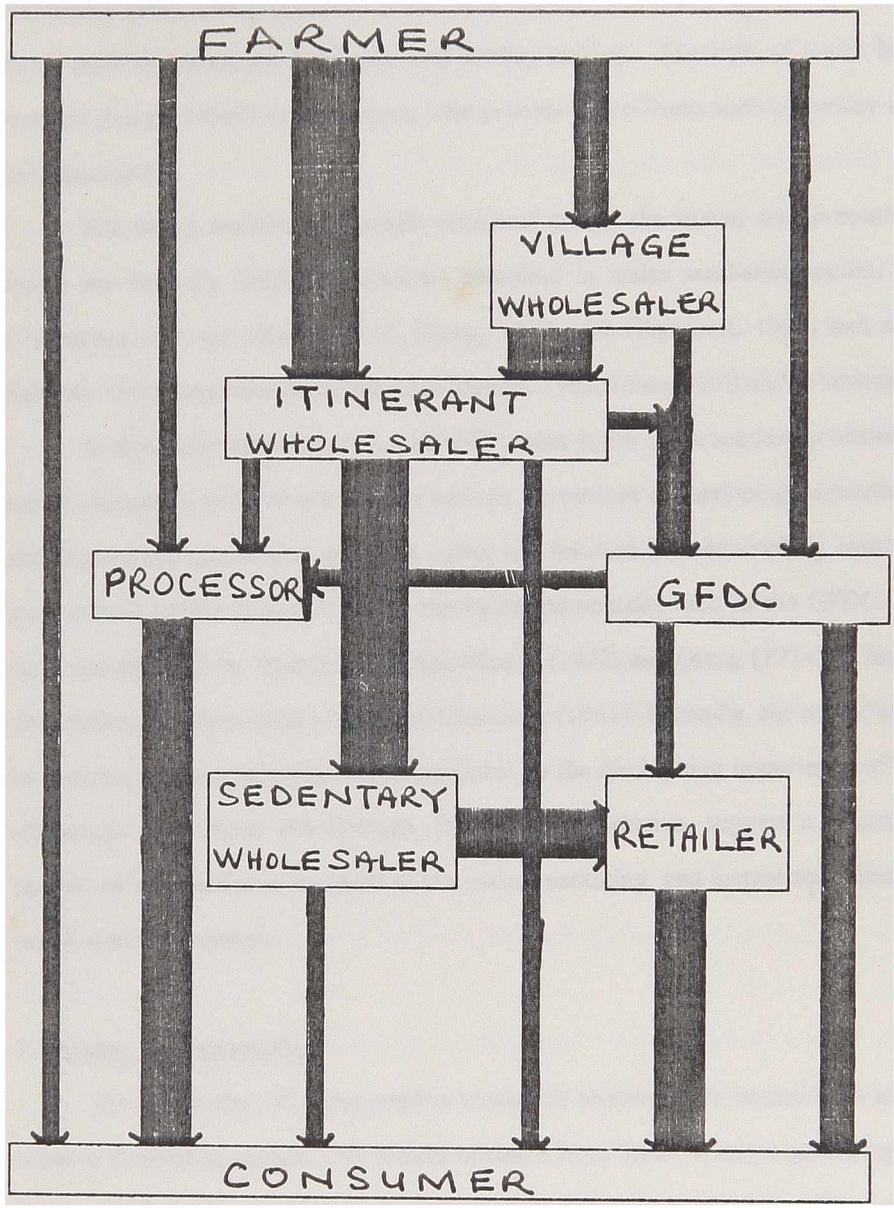
Food marketing in Ghana involves both parastatals and private traders but dominated by the latter who are mostly women. For each food item, there exists series of markets or institutions which facilitate the movement of the product from the producer or initial point of production to the ultimate consumer. These institutions or series of markets make up what is known as food marketing channels.

The maize marketing channels, Figure 3.1, was observed to involve the farmer and the consumer as well as a large number of private and public intermediaries. These intermediaries include local wholesale buying agents, itinerant wholesalers, sedentary wholesalers, retailers, and private storage operators. The thickness of the arrows is used to represent the relative amounts of maize moving along a particular channel.

The sources of supply available to the itinerant maize trader are diverse. The main source of supply for about 70 percent of the itinerant wholesalers(Figure 3.1) was directly from farmers, 20 percent got their supplies from village or rural markets while the remaining 10 percent had their supplies through the local based village wholesaler. The itinerant traders after moving the maize to the urban market may sell directly to sedentary wholesalers, retailers, processors and feedmillers, the Ghana Food Distribution Corporation (GFDC) and final consumers.

The itinerant traders (67%) were observed to sell mainly to sedentary traders. Suprisingly, only about 2 percent of the itinerant wholesalers supplies is purchased by the state buying institutions such as the GFDC.

FIGURE: 3.1 MAIZE MARKETING CHANNELS



Source: From Survey

An important outlet for the sedentary wholesaler is the retailer. About 78 percent of maize handled by sedentary wholesalers is sold directly to retailers and the goes directly to consumers (8%), and processors (14%) who convert the maize into animal feed or into forms such as corndough for banku and kenkey making. The bulk of maize handled by retailers also go directly to consumers, who process it into forms such as kenkey and banku for consumption.

The maize marketing channels observed during the survey and presented in this report are basically similar to channels identified in maize marketing studies in Ghana (Nyanteng and Appeldoorn, 1972, Oteng, 1974, and Ghanexim, 1991) and other Sub-Saharan Africa countries (Bohannan and Datton, 1962, Jones, 1972 and Whetham, 1972).

In this study, however, two main differences in the maize marketing channels. First, recent changes in government policies such as, divestiture of marketing parastatals and the abolition of the guaranteed minimum price, has resulted in a diminishing involvement of state owned buying corporations (or marketing parastatals) such as the GFDC, as against observations made by Nyanteng and Appeldoorn (1972) and Oteng (1974). This conforms observations by Amponsah (1988) and Ghanexim (1991). Secondly, the use of local agents by itinerant maize wholesalers has contributed to the diminishing importance of the village wholesaler. The above observations, though not conclusive, suggest a reduction in the number of intermediaries involved in the maize marketing, and increasing efficiency of the maize marketing system.

3.3 **Maize Transportation**

Several modes of transportation exists for movement of maize from main supply areas to consuming centres. Movement of maize from farms in major producing centres of Brong Ahafo region to consumer markets in Southern and Northern Ghana involve the following stages: (1) Movement of dehusked and unshelled maize from the farms to the farmer's house; (2) movement of dried and shelled maize from the famer's house to the rural

market or to the itinerant wholesaler's assemble point; and (3) movement of shelled maize from the farmer's house or the rural market to the urban market.

The movement of the dehusked and unshelled maize from farms to the farmer's home is usually by headload or porterage in 25-40 kg weight palm-woven baskets. The headloading was found to be done using family and hired labour, who usually carry the dehusked maize over a distance of between 0.5 and 15 km from where they are transported to the farmer's house by pick-ups, mummy trucks and tractors.

The dehusked and unshelled maize is shelled and transported to the rural market for sale, or sold at home to itinerant wholesalers, or their agents. The movement of shelled maize, from the farmer's house, to the rural market, is done by means of porterage using the farm family. Rural markets are usually located at a distance of between 0.2 and 2 km from the farmer's house. The shelled maize is usually transported in palm-woven baskets. Some farmers also transport their maize to the rural markets using pusher-trucks. The use of such trucks for this phase of maize transportation is, however, uncommon. In the case of itinerant wholesalers or buying agents who buy directly from the farmer's house, movement of shelled maize is done by means of porterage, using hired labour, to an assemble point in the locality. However, unlike yam which is usually purchased at the farmgate, maize is largely purchased from the farmer's home and with the help of local buying agents. The local buying agents undertake purchases, for itinerant wholesalers, on commission. The commission depends on the volume of maize assembled as well as the price at which the maize was purchased.

The movement of shelled and dried maize from the farmer's house or the rural market or assemble point to the urban market is undertaken by itinerant wholesalers, in 100 kg weight jute sacks, using mostly privately owned mummy trucks with capacity of between 3 and 5 tonnes. Tractors are also employed in this phase of maize transportation. The use of a mummy truck or tractor depends on two major factors, namely, distance and the condition of connecting roads. Itinerant wholesalers use tractors for the transportation

of maize for short distances between 10 and 80 km, and usually on poor roads impassable by most of the low traction mummy trucks. Mummy trucks are usually employed in the transportation of maize on relatively good roads and for distances of over 80km. Short distance haulage, using mummy trucks are also common.

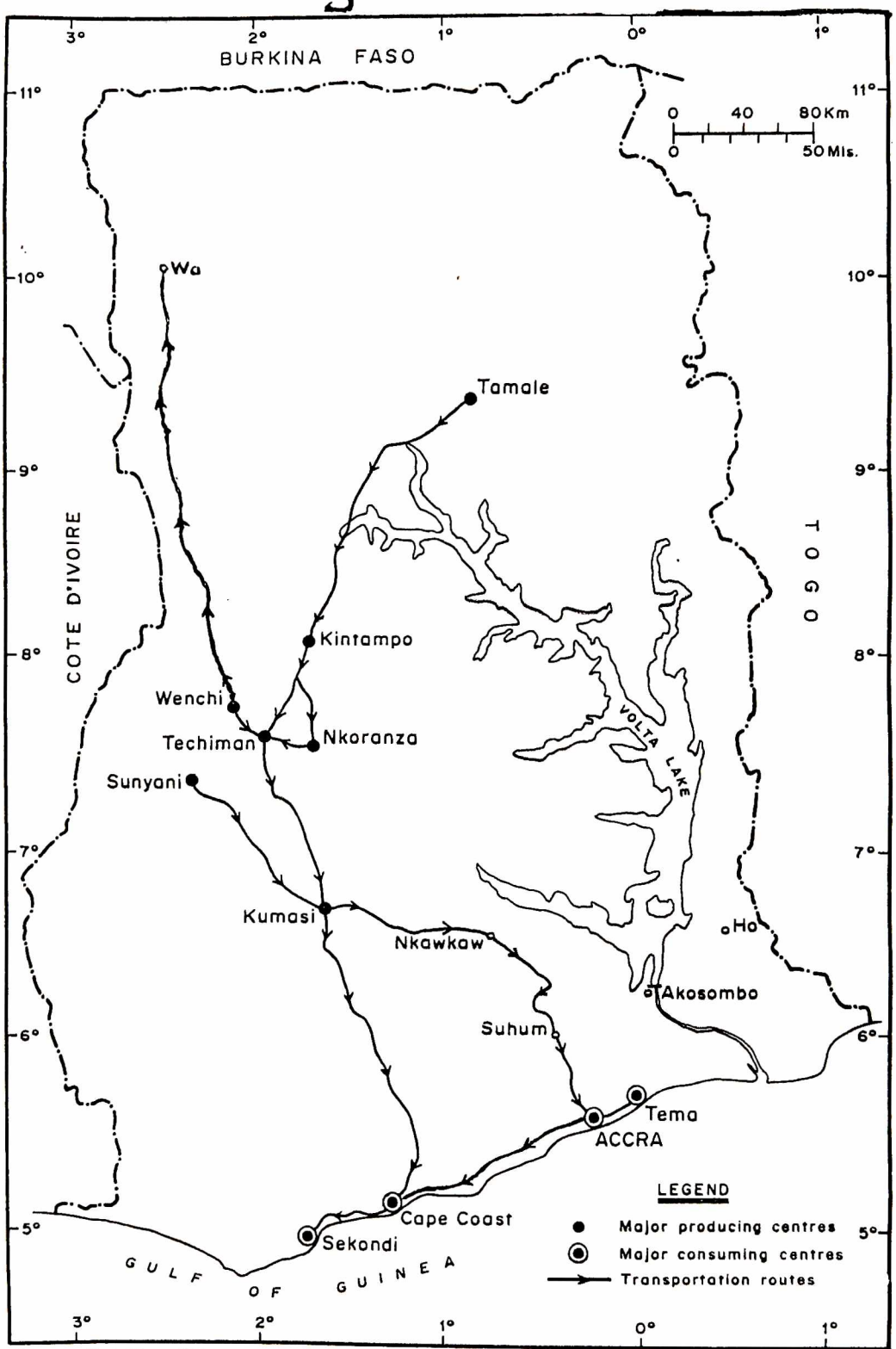
The itinerant wholesaler usually hires the truck or tractor on specific days after the maize has been purchased and assembled by the local buying agent. Usually, the local agent is given the period preceeding the next market day (or period) to purchase and assemble the maize.

Transportation of maize to urban markets is sometimes undertaken by means of public transport, such as the City Express Service and the Omnibus Service Authority, and usually in small quantities. These means of transport are however not dependable, since they have limited cargo space, and break-down very often. In other areas such as, Asesewa and Bimbilla, rail or lake transport systems (e.g. ferry and dug-out canoe) are used either as direct means of transportation to the final markets, or as complements to road transport. However, because of the unreliable and rudimentary state of these means of transport, road transportation is largely employed in the country.

The major road networks from main maize supply centres to major consuming centres are shown in Figure 3.2.

The survey area, Techiman, serves as a major producer market for maize produced in Tamale, Kintampo, Nkoranza, Wenchi and surrounding villages. The maize is brought for wholesaling to other itinerant wholesalers, sedentary wholesalers, retailers and consumers. The road networks linking most of these areas are generally in very poor condition and unmotorable during the major rainy season.

...ork for movement of Maize from Major Producing Areas to major consuming Areas.



SOURCE: FROM SURVEY

Maize assembled at Techiman and other producing areas are then transported to major consuming centres such as Wa, Accra, Tema, Mankessim, Cape Coast and Sekondi for wholesaling and retailing. Kumasi, in the middle belt, serves as an important maize assembling and transit point, for maize coming from Techiman and Sunyani, as well as a major consumer centre. Most of these major consuming centres are served by relatively good.

3.4 Maize Storage

Storage of commodities becomes necessary where there is a substantial time lag between production and consumption, and also where production is seasonal and consumption is all year round.

Storage defined here as deliberately holding a commodity over a of period two weeks or more, was uncommon among the maize wholesalers. This confirms the assertion that storage of foodcrops in Ghana is undertaken largely by farmers at the farm and village levels (Udry, 1990, Asante ***et al***, 1989, Nyanteng, 1972, and Mould, 1971). Traders only maintain stocks to meet their daily sales requirement. About 92 percent of the traders interviewed reported that they keep stocks for only about two week or less. Only 9 percent indicated that they carry stocks beyond two weeks.

Storage of maize, on-farm and at the village levels, is undertaken in granaries, various forms of barns, baskets, kitchen ceilings, ordinary rooms as well as other places not specifically designed for maize storage (Nyanteng, 1972).

Mould (1971) contends that both traditional and modern sophisticated methods are used by the maize farmer, with the former being largely employed. Mould describes three traditional methods of maize storage, namely: the ' Ewe Barn', a raised circular platform on which cobs are arranged to form a cylinder and covered with thatch; the `Ashanti Crib', a raised rectangular structure constructed of bamboo and roofed with thatch; and the 'Pole Type Storage', whereby cobs are hung from a horizontal pole.

Traditional and non-traditional methods of maize storage were observed in the markets surveyed. In the markets, dried shelled, and bagged maize is usually kept in open market spaces, on top of wooden planks raised above the ground with stones and cement blocks, and under sheds. Bag storage of maize in warehouses constructed from a variety of materials is also widely practiced. Silos of burnt brick, concrete, or aluminum are also used in urban areas, by public institutions, such as the GFDC.

About 16 percent of the maize wholesalers stored their produce under stalls and sheds in the market, 7 percent stored in warehouses of local storage operators in the markets, 5 percent in enclosed shops and 3 percent stored in facilities belonging to the GFDC. The remaining 69 percent leave the bagged maize in open spaces in the markets covered with polypropulene sheets.

Maize held by private operators usually belongs to itinerant and sedentary wholesalers. The itinerant wholesalers usually keep maize for shorter periods of between 2 and 7 days as they await transporters to move the maize to their final wholesale markets. Sedentary wholesalers who keep maize with storage operators, usually store between 10 and 40 bags for an average of about 5 days till the next market day. Private storage operators do not take title to maize under storage but hold them for a fee. Maize is held in 5mx9m enclosed concrete structures with an average capacity of 80 maxi bags (100kg/bag) of maize. The storage operators do not fumigate during storage or dry the maize. This is possibly because of the short periods for which the produce is held.

As indicated earlier, deliberate holding of maize by maize traders over considerable periods of time was uncommon. About 84 percent of the maize traders kept maize for up to one week, about 8 percent kept it for up to two weeks and the remaining 8 percent held the product for beyond two weeks.

The low level of stored maize by traders probably reflects the lack of proper storage facilities. Southworth, ***et al*** (1979) and Udry (1990) attributed the absence of maize storage by traders to the fact that they see much return in rapid turnover than in storage.

3.5 Maize Processing

Most foodstuffs are traded in their raw form in Ghana. Processing, however, can extend the shelf life of the highly perishable foodstuffs, improve their quality and as a result, make the food available to consumers over a longer period. Food processing is undertaken mainly by women, using simple traditional methods.

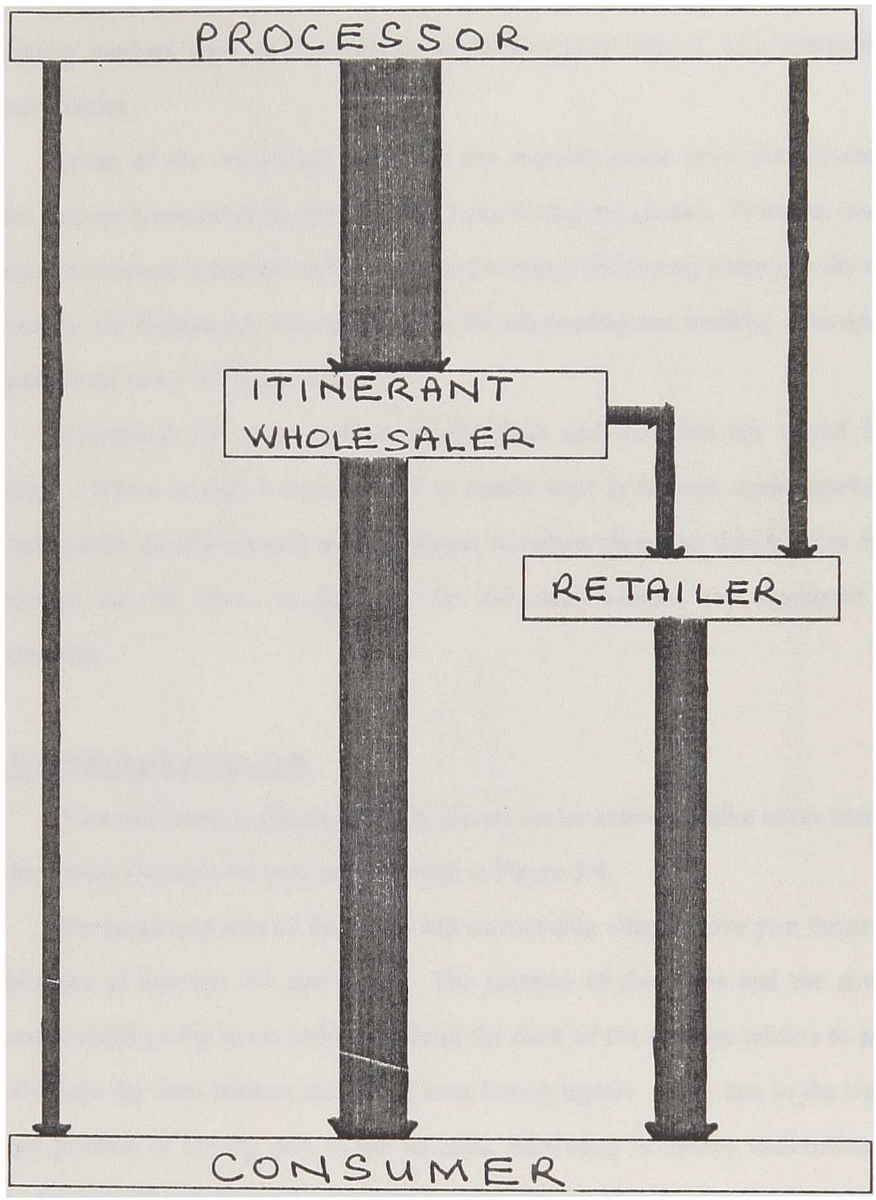
Maize is processed, mostly, into moist corn flour by men and subsequently mixed with water to produce corn dough by women. Yam is, however, not processed into any other final product.

3.5.1 Processed Maize (Corn dough) Marketing Channels

Corn dough marketing involve very simple channels with fewer intermediaries, compared to maize and Yam , as shown in Figure 3.3.

Corn dough marketing mainly involves movement of the processed product from the processor to the itinerant wholesaler and then to the final consumer. The thickness of the arrows is used to represent the relative amounts of corn dough moving along the particular channel. The itinerant wholesaler may also sell the corndough to the retailer or directly to the consumer. The volume of corndough going through such outlets are very small because of certain peculiar characteristics of the itinerant corndough wholesalers. The itinerant corndough wholesaler, unlike the maize or yam itinerant wholesalers, buy the corndough from the processors and transport the product to the urban market for retailing directly to the consumers. The corndough itinerant trader, therefore, undertakes the important roles of the sedentary wholesaler and the retailer, thereby reducing the number of intermediaries. Corndough marketing consumers include institutions such as schools, hospitals and security units, and individual households.

FIGURE 3.3 CORN DOUGH MARKETING CHANNELS



Source: From Survey

3.5.2 Transportation and Storage of Corn Dough

Corndough is usually transported by porterage from nearby villages to major assembling markets such as Agormanya in the Somanya district, and Dzameni in the Kpando district.

Some of the corndough traded in the markets come from the Kwahu North district, and are transported across the Volta Lake in dug-out canoes. From the assembling markets, corndough is transported by road to the major consuming centres in the country, particularly, the Mallam Ata Market in Accra, for wholesaling and retailing. Transportation is usually done using 7-9 tonne trucks.

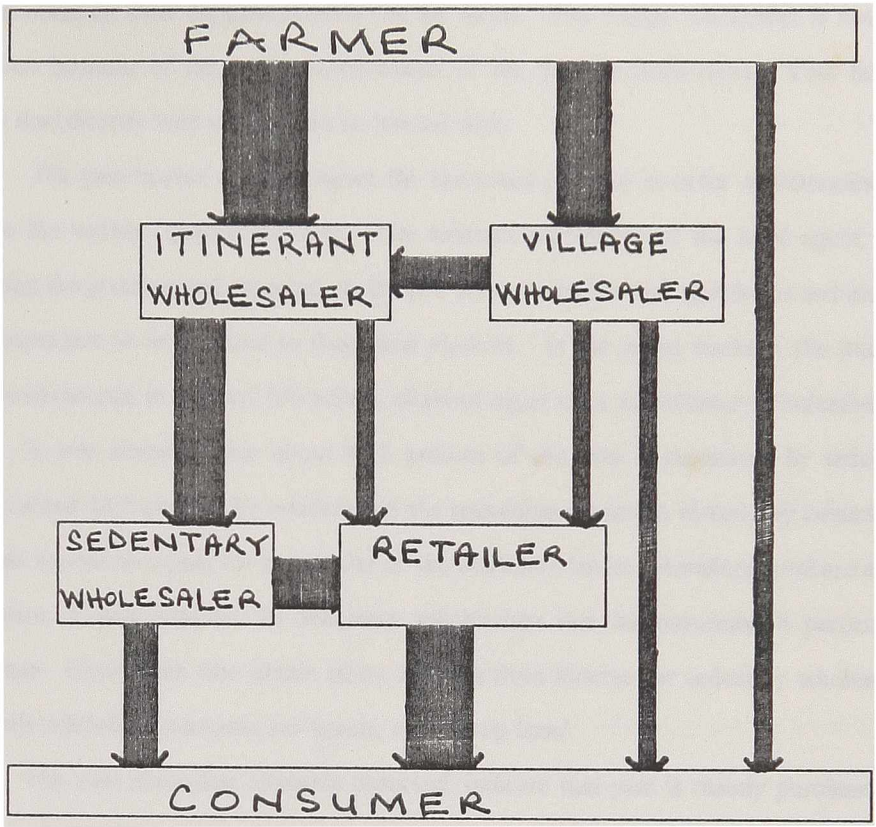
Corndough has poor storage characteristic and therefore not stored for long periods. Where storage is necessary, it is usually kept in baskets, under market stalls. The baskets are usually covered with polythene, to reduce shrinkage through loss of water. Corndough can be stored in this way for 4-7 days without any significant quality deterioration.

3.6 Yam Marketing Channels

Yam marketing in Ghana is mainly private sector activity, unlike maize marketing. The marketing channels for yam are presented in Figure 3.4.

The producing area of Techiman and surrounding villages have yam farms located at distances of between 0.5 and 8km . The location of the farms and the absence of motorable roads to the farms make it difficult for most of the itinerant traders to purchase directly from the farm without the use of local buying agents. Also, due to the traditional storage practice of leaving yam in the mounds, harvesting is usually undertaken after a buyer has been found, hence the need for local buying agents who undertake purchases for the itinerant traders.

FIGURE 3.4 : YAM MARKETING CHANNELS



Source: From Survey

Of the itinerant traders studied, about 60 percent obtained their supplies through local buying agents and 7 percent purchased yam from the village wholesaler. The remaining 33 percent obtained their supplies directly on the farms. The village wholesaler is not very important because of the active involvement of the farmers themselves. Yam farmers usually deal directly with yam buyers on market days.

The yam buyers usually inspect the harvested produce in order to determine and endorse the variety, quality and size. The itinerant wholesaler of the local agent, after inspecting the produce and agreeing on the unit price, assemble their purchases and arrange for transporters to move them to their final markets. In the urban markets, the itinerant traders sell the yam in units of 100 tubers, of about equal sizes, to sedentary wholesalers.

It was observed that about 83.5 percent of the yam is purchased by sedentary traders, about 12.5 percent by retailers and the remaining 4 percent directly by consumers. The main source of supply for the retailer is the sedentary trader. Retailers purchase about 92 percent of yam supplied by sedentary wholesalers and the remaining 8 percent by consumers. Consumers who obtain direct supplies from itinerant or sedentary wholesalers are mostly schools, restaurants and hotels, and 'Chop Bars'.

The yam marketing channels observed, indicate that yam is mainly purchased by itinerant wholesalers, acting through local agents or village based wholesalers, and then sold to sedentary wholesalers who sell to retailers. The main yam marketing channel has four intermediaries - village based wholesalers, itinerant wholesalers, sedentary wholesalers and retailers - between the farmer and consumer. This confirms the findings of other researchers on yam marketing channels, such as, Nyanteng(1969) and Amedume (1990).

3.7 Yam Transportation

The movement of yam from producers or farmers to consumers involves the following stages: (1) movement of yam from farms to the farmer's house or directly to assemble points of the itinerant wholesaler or to the village wholesaler; (2) movement of

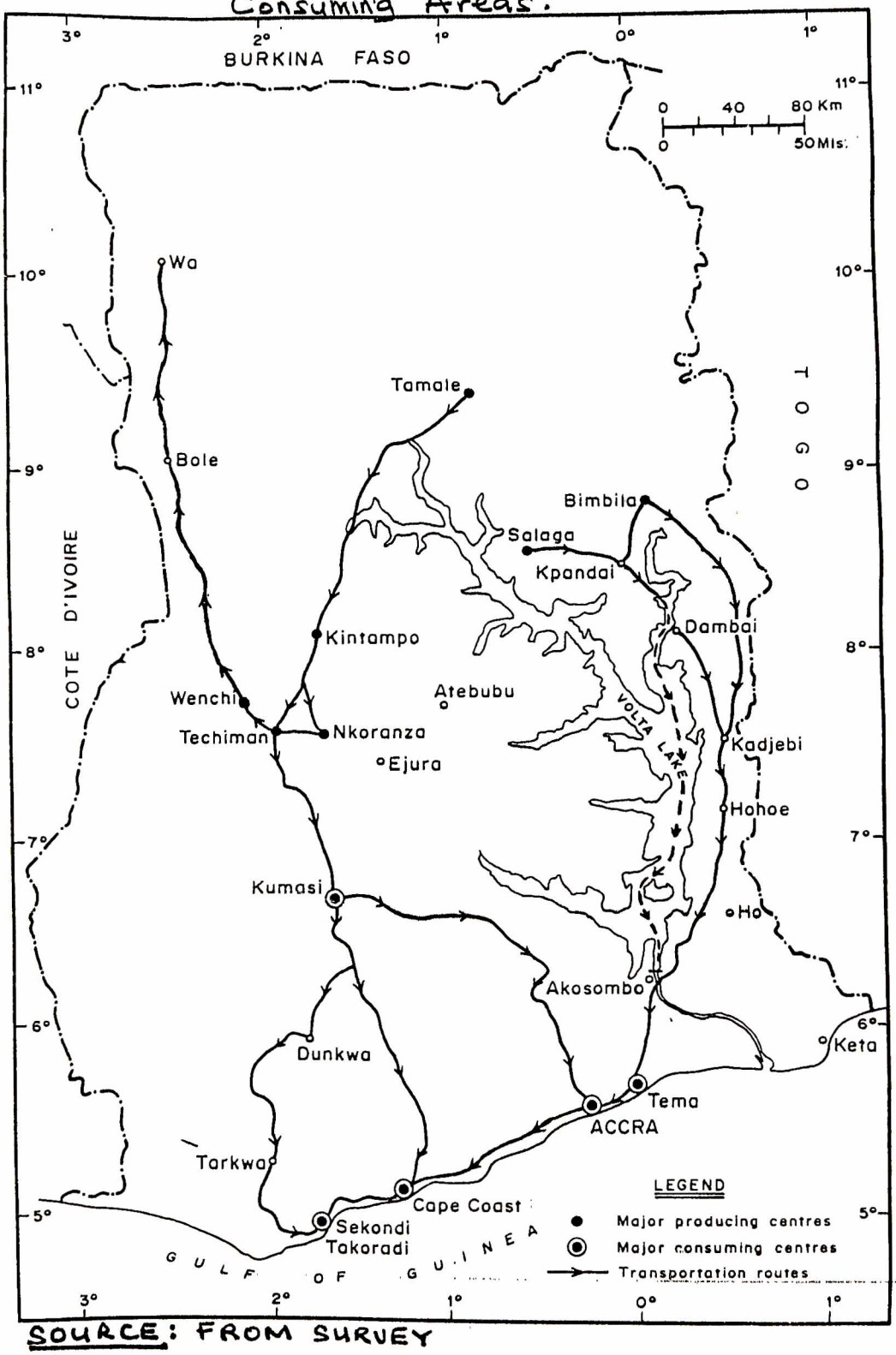
yam from the farmer's house to the rural market or directly to assemble points of the itinerant wholesalers; and (3) movement of yam from the rural market or assemble point or farmer's house to itinerant wholesaler's final market.

Each stage of yam movement involves one or more modes of transportation. The farmer, after harvesting yam, assembles them in units of 100 tubers which may be inspected by the itinerant wholesaler for immediate purchase, or transported to the farmer's house for sale at home or the rural market. Harvesting is normally undertaken a day before the market day. The harvested yam, which are not purchased on the farm are then carried in baskets containing between 5 to 8 tubers to the farmer's house. Porterage of yam is undertaken typically by women and children in the farm household. The adult males sometimes use bicycles to transport yam, especially in the north. Hired labour, employed for yam porterage are usually members of the farmer's extended family, are sometimes engaged in porterage of yam from the farm to the house. In the case of itinerant wholesalers or local buying agents who purchase yam on the farm, transportation to the assembly points is mainly done by porterage using hired labour.

The second stage of yam transportation in the marketing channels involves the movement of the commodity from the farmer's house to the rural market by the farmer or to the assembly point of the itinerant trader by the local buying agent. The rural market is usually a distance of between 0 and 25 km from the farmer's house. Movement of yam to the rural markets are mainly by means of porterage and bicycles. In the market, the farmers arrange yam in units of 100 tubers for inspection by itinerant wholesalers and other buyers.

The itinerant wholesaler, after agreeing with the farmer on price, quality and size, usually employs hired labour to headload the yam to the assembly points. The itinerant wholesaler then hires 3-5 tonne tractors or 7-9 tonne trucks, depending on the place of purchase (farm gate, farmer's house, or rural market) and the road condition. Tractors are used to transport yam from the farmgate to the rural market, while trucks are mainly used for yam transportation from rural markets or farmer's house directly to urban markets.

Figure 3.5: Road Network for Movement of Yam from Major Producing Areas to Major Consuming Areas.



SOURCE: FROM SURVEY

The road networks for yam transportation from main supply areas to consuming centres are presented in Figure 3.5. Itinerant wholesalers obtain their supply of yam from major producing areas such as Abaase, Apesika and Zambrama, all in the Nkoranza district, about 25km from Techiman. Some supplies also come from Tamale, Kintampo, Wenchi and Bamboi to the Techiman market. Yam assembled in the Techiman market are transported in 7-9 tonne trucks to consumer centres in the southern part of the country such as Kumasi, Accra, Tema, Mankessim, Cape Coast and Sekondi. Itinerant wholesalers from Wa in the Upper West Region also purchase yam from the Techiman market. Kumasi is a typical assembling and transit market in the southern part of the country from where yam, coming from Techiman and other major producing areas such as Atebubu and Ejura are assembled for wholesale.

Yam from main supply areas of Saboba, Bimbila and Salaga are transported directly by road to Accra or by the Volta Lake on ferry (350-400 tonne capacity) from Yeji to Akosombo and then by road to Accra, as shown in Figure 3.5.

3.8 Yam Storage

Yam storage is largely undertaken by farmers on their farms using traditional methods and structures (Nyanteng,1971 and 1972). On the farm, yam is stored in mounds, heaped and covered with sand or heaped and covered with grass.

In the Techiman and Konkomba market in Accra, yam wholesalers stored yam by arranging them in cone shape on the bare ground or on vines, covered with 'spear' grass. Yam stored in this way are exposed to the sun and rain as well as to pests and diseases. Yam, left in the open space of markets, under the care of night watchmen are sometimes stolen posing additional storage cost through losses.

Only 20 percent of yam wholesalers interviewed owned storage structures in their final markets of operation. These were, generally, improvised storage structures. In the

Konkomba yam market, the storage structures were mainly wooden structures roofed with asbestos sheets.

The lack of proper and adequate storage structures in markets, explain the virtual absence of yam storage by traders. What really takes place can probably be described as warehousing.

In the study, about 48 percent of yam traders interviewed held stocks for one week or less, about 10 percent held stocks for up to about two weeks, and 36 percent occasionally held stocks beyond three weeks, but below 24 weeks, when the yam starts to germinate. The absence of deliberate yam storage by about 76 percent of the traders possibly results from the absence of proper and adequate facilities in the markets and the biological nature of yam.

Storage losses of roots and tubers are generally high in the country. The study observed losses in transit of about 3 and 1 percent for yam and maize, respectively. The main problem with storing roots and tubers is their high moisture content. They continue to respire and metabolize at a faster rate in storage than cereals (Booth,1974). They can however be stored from a few weeks to about six months (Nyanteng,1972). After six months (24 weeks), losses result mainly from sprouting. Other causes are: destruction by rodents, rotting during storage, and bruising and breakages during loading and off-loading. Losses resulting from these causes were in the region of between 2 and 5 percent, and averaged about 3 percent.

CHAPTER FOUR

4. MARKETING COSTS AND MARGINS

In the performance of the physical activities of agricultural marketing described in chapter 3, costs are incurred.

According to Bell (1979), marketing costs can be analysed at three different levels. The most basic type of marketing cost analysis involves the use of the profit and loss statement prepared for other accounting purposes. In the second method, costs are studied according to the purposes for which they are incurred. The third type of analysis centres on the costs of particular marketing functions (viz., exchange, physical and facilitation).

The analysis of marketing costs in the present study centres on the costs of particular marketing functions. Marketing cost is therefore defined as cost incurred in performing marketing functions such as transportation, storage, processing and handling. The gross margin is also defined as the selling price less the purchase price.

Carman and Uhl (1973) identified some useful operating ratios for the analysis of marketing costs. These were:

1. Marketing cost to Gross Margin
2. Marketing cost to wholesale price
3. Purchase price to wholesale price
4. Mark-up on purchase price
5. Individual costs to total marketing costs.

These ratio's are part of the analysis of marketing costs and margins in the study.

4.1 Factors in Transportation Costs

Studies of agricultural intensification in Africa have shown that farmers intensify their production systems only when there are adequate transport links to the market (USDA, 1954, and Grolleand and Kohler, 1979).

The factors which determine transportation costs of agricultural commodities are: the spatial separation of markets, the condition of roads, the level of integration of the transportation network, availability of suitable vehicles, maintenance regime of vehicles, running cost of vehicles, availability of cargo for in and out journeys, and the number of security check points, among others.

The feeder road density in Ghana averages only 89m/sq km which is only roughly equal to that of India in 1951 (MOA,1990). Most of the feeder roads are not properly maintained and many of them are impassable during the rainy season. It is estimated that only about 3,300km (16%) of Ghana's 21,300km of feeder roads are in good condition (motorable all the year round); about 5,100km (24%) are in fair condition; and the remaining 12,900km (60%) are in poor condition (MOA,1990). Among the trunk roads, 29 percent were in good condition in 1991, 32 percent fair and 39 percent poor. From 1987 to 1991, the percentage of roads in good condition increased by 7 percent, while the number of poor condition roads also increased by 3 percent (World Bank, 1993). The road network in Ghana is therefore, generally poor and adds excessively to the cost of transporting produce from the farm gate to the consumer.

The transportation network in Ghana is also not adequately integrated. Lack of information on availability of load leads to situations whereby transporters are compelled to make empty return trips to producing centres, thus increasing their operating cost which is eventually passed on to the consumer. Eicher and Baker (1982) contend that inability to secure backhauls is a major problem influencing commodity transporters' operating cost.

The elements of agricultural commodity transporters' operating cost include fuel cost, booking fees, bridge and road toll, income tax, and repair and maintenance costs, among others. Most of the trucks operating on the routes studied are not road worthy and hence fall into constant trouble with the police and other security personnel who guard the numerous check points along the routes. For example, there are 9 check points between Techiman and Accra, a distance of about 390km. This indicates that transporters encounter security personnel every 43km of the journey. As a result of the poor state of their vehicles

and the presence of security personnel, transporters are compelled to pay cash tips ranging between ¢500 and ¢5,000 per trip. In addition, they sometimes have to give some of the commodities to the security personnel in other to be allowed to have a smooth journey without undue delays. The transporters reported that they, in some instances, had to pay the traders for produce taken by the security personnel.

4.2 Maize and Yam Wholesalers' Transportation Costs

(a) Maize Transportation Costs

The itinerant maize wholesalers in this study , as explained in chapter 3, mainly purchased maize from villages such as Abease, Apesika and Zambrama, an average distance of about 4km from main assemblying points in Nkoranza. From Nkoranza, maize is transported by either tractors or trucks to the final markets in Techiman, Accra and Kumasi.

The transportation cost estimates for maize wholesalers are presented in Table 4.1.

Table 4.1: Transportation cost of Maize Wholesalers

Route	Distance (KM)	Transport Cost (¢)/ 100kg-bag	Transport Cost(¢)/ tonne-km
Farmer's house to Assembly Pt. (Nkoranza area)	4	200	500.00
Nkoranza to Techiman	24	400	166.67
Techiman to Kumasi	90	1000	111.11
Techiman to Accra	390	3200	82.05

Source: Survey Data

Table 4.1 indicates a high transport cost of ¢500 per tonne-km for porterage of maize over an average distance of 4km. The transport costs by road averaged ¢166.67 per

tonne-km for poor roads and between ¢82.05 and ¢111.11 for good roads indicating that transport cost is higher for porterage than truck transport (Table 4.1). Ghanexim (1991) also obtained an estimate of ¢1,282 per tonne-km, for porterage of maize, and a transport cost of ¢55.93 per tonne-km for road transport.

The high maize transportation cost from the farmer's farm or house to assembly points is probably due to the poor condition of roads and the absence of defined tracks or paths. Tractors and mummy trucks are usually unable to undertake commodity transportation at this stage. Transport costs were higher for the Nkoranza-Techiman road, a poorly maintained road, than for good roads, such as, Techiman-Accra and Techiman-Kumasi. The results indicate that road condition, rather than distance and the number of operating vehicles, is the major determinant of the cost of transportation in Ghana.

(b) **Yam Transportation Costs**

Yam is mainly purchased from the farm and transported over an average distance of 25km to assembly points - usually the home of the farmer or local buying agent or a rural market place. From the assembly point, yam is then transported to wholesale markets in Techiman, Accra and Kumasi.

The road transportation cost estimates for yam wholesalers are presented in Table 4.2.

Itinerant yam wholesalers interviewed in the survey, paid between ¢1,400 and ¢2,000 per 100 tubers of yam transported from farms or farmers' houses to assembly points, an average distance of 25km, using 3 to 5 tonne tractors.

Table 4.2: Transportation Cost of Yam Wholesalers

Route	Distance (KM)	Transport Cost (¢)/ 100 tubers	Transport Cost (¢)/ tonne- km
Farm to Assembly point	25	1,670	238.40
Techiman to Kumasi	90	3,000	119.00
Techiman to Accra	390	14,000	128.21
Bimbilla to Accra	392	13,000	118.44

***Note* : 1,200 tubers with average weight of 280 Kg/ 100 tubers**
Source: Survey Data

With an average charge of ¢1,670 per 100 tubers of yam (Average weight of 280kg), the yam wholesaler incurs a transport cost of ¢238.40 per tonne-km, using human porterage (Table 4.2). Ghanexim (1991) obtained a transport cost of ¢520 per tonne-km for yam transportation from farms to the farmers' homes in Salaga, using tractors. The difference in tranport cost per tonne-km, observed in the two studies possibly results the poor state of farm tracks in the Salaga yam producing area as compared to farm roads and tracks in the Techiman yam producing areas.

Transportation of yam from assembly points to wholesale markets in Kumasi and Accra was by means of 7 to 9 tonne trucks. The transportation cost estimates show that moving yam from Techiman to Kumasi and Accra costs about ¢3,000 and ¢14,000 per 100 tubers or about ¢119 and ¢128.21 per tonne-km, respectively. In the Ghanexim (1991) study, the yam wholesaler who transported yam from Salaga to Accra, by means of a 7 to 9 tonne trucks, incurred a transport cost of ¢53.20 per tonne-km. Nyanteng (1969) obtained transport costs of between N¢1.34(or ¢ 61.18 at 1991 CPI-Food) and N¢4.46 (or ¢ 203.63 at 1991 CPI-Food) per tonne-km for porterage of yam from farms to Ejura and Amantin, over distances of between 0.8 km and 16 km, respectively. In the study by

Nyanteng (1969), transport costs per tonne-km for itinerant wholesalers who use trucks for transportation of yam from Bimbilla to Kumasi, and Kumasi to Accra ranged from N¢0.29 (¢ 13.24 at 1991 CPI-Food) to N¢0.77 (¢ 35.16 at 1991 CPI-Food) and N¢0.26 (¢ 11.87 at 1991 CPI-Food) to N¢1.05 (¢ 47.94 at 1991 CPI-Food), respectively.

The studies by Nyanteng (1969) and Ghanexim (1991) both indicate high cost for porterage and are supportive of the observation, in the present study, that transport costs are higher for commodity transport by porterage than by truck.

In comparison to the Techiman-Accra route, the relatively low transportation cost of ¢118.44 per tonne-km for the Bimbilla-Accra route possibly results from the existence of an alternative water transport system (see Ghanexim, 1991). Another reason is that most of the trucks operating on the Bimbilla - Accra route belong to yam farmers and village wholesalers based in the producing area. Therefore, the transport owners are able to arrange full load for their vehicles without extra cost due to delays.

The study further shows that transport cost per tonne-km is generally higher for yam than for maize. This is because, whereas maize is transported in packaged form, in jute sacks, no such packaging is available for yam. Yam, therefore, requires more handling time and occupies more haulage space (or volume) in relation to its weight.

4.3 Commodity Transporters' Operating Costs

(a) Maize Transporter's Operating Cost

Fuel consumption, per round trip, for maize transporters were: Nkoranza to and from Techiman (18 litres); Techiman to and from Accra (146 litres); and Techiman to and from Kumasi (33 litres). The price per litre of diesel was ¢360. The transporters could not give the lubricants consumption per round trip hence, a conservative figure representing 20 percent of fuel consumption was utilised. Average wage of drivers and their mates per round trip were: ¢15,000 per driver and ¢6,000 each for two mates for both Techiman - Accra and Techiman - Kumasi routes; and ¢8,500 per driver and ¢2,000 for one driver's mate for the Nkoranza - Techiman route. The average haulage capacity per round trip was 80 bags (100kg/bag).

The estimates in Table 4.3 indicate that in moving maize from Nkoranza to Techiman, the transporter incurs a higher operating cost of ¢135.43 per tonne-km compared with ¢39.6 and ¢76.92 per tonne-km for Techiman - Accra and Techiman - Kumasi, respectively, because of the poor state of the Nkoranza - Techiman road.

Table 4.3: Estimates of Operating Costs of Maize Transporters (cedis per round trip)

Cost Item	Nkoranza to Techiman	%	Techiman to Accra	%	Techiman to Kumasi	%
Fuel	6,480	24.9	52,560	42.5	12,150	21.9
Lubricants	1,296	5.0	10,512	8.5	2,430	4.4
Booking Fees	600	2.3	8,600	7.0	3,500	6.3
Wages	10,500	40.4	27,000	21.9	27,000	48.8
Income Tax	1,400	5.4	1,400	1.1	1,400	2.5
Repairs & Maint.	3,926	15.1	16,760	13.6	6,700	12.1
Tips	1,800	6.9	6,720	5.4	2,200	4.0
Total Operating Cost	26,002	100.0	123,552	100.0	55,380	100.0
Cost\ tonne-km	135.43		39.60		76.92	

Source: Survey Data

Repairs and maintenance costs for transporters ranged between 12.1 and 15.1 percent of total operating costs, and were high for the Nkoranza - Techiman road which is a poor road. Tips given to security personnel at the various check-points ranged between 4.0 and 6.9 percent of total operating costs. In general, operating costs per tonne-km were higher for poor roads than for good roads. The difference in transport costs per tonne-km for the Techiman - Kumasi and Techiman - Accra routes, with similar road conditions, can

be attributed to fixed costs such as Income Tax and Wages which do not depend on distance. They formed between 23.0 and 51.3 percent of the operating costs of transporters operating on these two routes.

The trend in operating cost per tonne-km, shown in Table 4.3 for the specified routes, is similar to that observed in Table 4.1 for transport cost estimates for maize wholesalers. The difference in transport cost per tonne-km and operating cost per tonne-km, shows that maize transporters plying between Techiman and Accra obtain a gross margin of ¢42.45 per tonne-km compared to ¢31.24 for transporters operating on the Nkoranza - Techiman route.

The results presented in Tables 4.1 and 4.3, though not conclusive, are supportive of the fact that transport charges depend largely on road conditions, since road conditions greatly influence the operating costs and margins of transporters.

(b) **Yam Transporters' Operating Cost**

Transporters who move yam from Techiman to Accra (390km) and from Bimbilla to Accra (392km) required an average of 146 litres of diesel (at ¢360 per litre) per round trip. About 72 percent of the transporters used vehicles with diesel engines.

The booking fees per round trip were ¢7,300 and ¢5,700, respectively, for Techiman - Accra and Bimbilla - Accra yam transporters (Table 4.4). Income Tax payments per round trip averaged ¢1,866 for yam transporters on both routes, and the repairs and maintenance costs averaged ¢15,963 and ¢15,923 for Techiman - Accra and Bimbilla - Accra yam transporters, respectively. Tips, in kind and in cash, also averaged ¢8,650 and ¢4,733, respectively for vehicles plying the Techiman - Accra and Bimbilla - Accra routes. In addition, the Bimbilla - Accra yam transporter incurred a bridge toll of ¢400 for the use of the Adomi Bridge at Atimpoku and the Accra - Tema motor-way.

Table 4.4: Estimates of Operating Costs of Yam Transporters (cedis per Round Trip)

Cost Item	Techiman to Accra	%	Bimbilla to Accra	%
Fuel	52,560	37.9	52,560	39.3
Lubricants	10,512	7.6	10,512	7.9
Booking Fees	7,300	5.3	5,700	4.3
Wages	42,000	30.2	42,000	31.4
Bridge Toll			400	0.3
Income Tax	1,866	1.3	1,866	1.4
Repairs & Maint.	15,963	11.5	15,923	11.9
Tips	8,650	6.2	4,733	3.5
Total Operating Cost	138,851	100.0	133,694	100.0
Total Operating Cost/tonne-km	52.98		50.75	

Source: Survey Data

An analysis of the operating cost for transporting yam from Techiman to Accra and Bimbilla to Accra shows a per tonne-km range of ¢50.75 and ¢52.98. This indicates yam transporters' profit margin of between ¢67.69 and ¢75.23 per tonne-km. The results in Tables 4.2 and 4.4 show that the Techiman - Accra yam transporter obtains a higher profit margin than the yam transporter operating between Bimbilla and Accra. The high profit margin of ¢75.23 per tonne-km for the Techiman - Accra yam transporter is due to the absence of reliable alternative modes of yam transportation from Techiman to Accra. Rail transport facility exist between Kumasi and Accra, this is however not reliable. This accounts for the higher transport cost per unit for Techiman - Accra yam wholesalers. The presence of a reliable alternative transportation facility (water transportation) for the Bimbilla - Accra route possibly accounts for the low profit margin for transporters operating on the route.

Again, the results in Table 4.3 and 4.4 indicate higher transport charges per tonne-km for routes on which higher vehicle operating costs per tonne-km are incurred.

A comparison of cost estimates for yam and maize shows that although vehicle operating costs are generally lower for yam, transport charges are higher for yam than maize, since yam occupies more space during transportation. Unlike maize which is transported in jute sacks, yam is not packaged during transportation. Transport costs are

also higher for porterage of commodities and for commodity transportation on poor condition roads.

The results have very useful implications for policy makers since they suggest that a reduction in transport charges, and hence food cost, can be achieved through policies that seek to reduce fuel and lubricant costs, booking fees, and repairs maintenance costs. A discussion of these policies is taken up in chapter 6.

4.4 Factors in Storage Costs

Agricultural commodities traded in the country are generally perishable in the raw form. The storage of such commodities reduces losses resulting from spoilage, dehydration and germination. The need for storage also arises out of the lack of adjustment between the time of production and consumption of the commodity. It also performs an auxiliary service in assisting in the transfer of commodities from place to place during the marketing process.

Traders dealing in maize and yam interviewed during the survey, stored only what they could not sell during a particular market day. This,as explained in chapter 3, is because traders see substantial benefit in rapid turnover compared to storage, and also, proper storage facilities are absent in the markets.

About 20 percent of the maize wholesalers interviewed, stored their maize in warehouses owned by private storage operators in the markets. About 2 percent stored with the GFDC, while the remaining 78 percent leave their maize in the open space in the markets or at home.

4.5 Maize and Yam Storage Costs

(a) Maize Storage Costs

About 70 percent of the maize traders interviewed in the survey, leave their produce in the markets under the care of watchmen who charge a fee of ¢100 per bag of maize per night.

Private storage operators in the Techiman and Kaneshie markets usually hold maize for short periods, between 4 to 7 days at a time. Between 10 and 40 bags of maize, are usually held for an average of 5 days till the next market day. The average quantity, traders store per day, was 22 bags. Traders who keep maize with private storage operators, while awaiting sale or transportation, paid an average of ¢80 on a bag of maize per day. The private storage operators keep the maize in 5mx9m rooms with an average holding capacity of 80 maxibags of maize.

The cost elements of private storage are, mainly, rent on land, watchman salary, electricity bill, market toll, and Local Council (Assembly) levies. Private storage operators interviewed in the survey do not fumigate maize in storage.

The average rent on land was ¢8,895 per month and a watchman was paid ¢15,000 per month. Electricity bill for a month averaged ¢3,880. The private storage operators also paid ¢400 market toll and ¢500 local council or assembly fees per market day. The average earnings per employee in the agricultural sector, ¢13,317, obtained from the Ghana Statistical Service (1992) is used in the study as a proxy of the storage operator's wages.

The Techiman market has three market days in a week, giving total market toll of ¢4,800 per month. This brings the total operating costs of the private storage agent to ¢51,892 per month, as shown in Table 4.5.

Table 4.5: Estimates of Operating Costs of Private Storage in Techiman Market (Cedis per month)

Cost Item	Amount
Rent	8,895
Electricity	3,880
Watchman Wages	15,000
Operator's Wages	13,317
Market Toll	4,800
Council Fees	6,000
Total Operating Costs	51,892
Total Operating Costs/bag/day(a)	**64.9**

Source: Survey Data

Note: (a) Average of 40 bags stored for 5 days in a week.

The average utilised capacity of the storage rooms was 40 bags (100kg/bag). The operating cost encountered by the storage operator was ¢64.9 per bag per day. The storage charge on a bag of maize is, however, ¢80 per bag per day. This gives a margin of ¢15.1 per bag per day for the storage operator. The survey also showed that the private storage operators usually demand payment before the service is rendered.

The survey indicated that the average cost of erecting a 5mx9m cement structure for use as storage room or warehouse in the market was ¢882,787 with a range of between ¢600,000 and ¢2,200,000.

The survey also showed that only about 2 percent of traders (itinerant and sedentary) store maize with the GFDC.

The storage cost to traders, is estimated using the amounts charged by the GFDC for each specific service provided (Table 4.6). The storage costs of the GFDC, unlike that of private storage operators, include the cost of drying, cleaning, and fumigation by spraying. Fumigation is mandatory for all maize stored by GFDC.

Table 4.6: GFDC Maize Storage Charges (Cedis per bag)

Item	Charge(¢)
Drying	740
Cleaning	160
Fumigation	60
Storage	100
Total Storage Charge (1 month)	1,060
Total Storage Charge (2 month)	1,160
Charge/ bag/ day (1 month)	35.33
Charge/ bag/ day (2 months)	19.33

Source: GFDC, Accra.

The cost of drying was ¢740 per bag. The GFDC also charges ¢160 per bag for cleaning, and ¢60 for fumigation. The GFDC, in addition, charges a flat rate of ¢100 per bag per month for storage.

The storage charge by the GFDC for the first month is ¢1,060 per bag which implies a charge of ¢35.33 per bag per day. The storage charge for two months is ¢1,160 per bag or ¢19.33 per bag per day.

A comparison of the maize storage charges by public and private agents presented in Table 4.7, indicates that a maize trader who stores a bag of maize with the GFDC incurs a lower charge than a trader who stores maize in the other places.

Table 4.7: Comparative Maize Storage Charge

Place of Storage	Storage Charge (cedis/bag)		
	1 day	1 month	2 month
Market Sheds or open space	100	30,000	60,000
Private Storage rooms	80	24,000	48,000
GFDC silos	35	1,060	1,160

Source: Survey Data and GFDC, Accra

Maize traders interviewed in the survey, however, preferred storing maize in other places than the GFDC. This is due to the fact that the GFDC's silos are located far away from the markets, and as a result traders incur additional charges and inconveniences in transporting maize from the markets to the storage depots and back. Secondly, the traders also complained of administrative delays in the process of getting maize stored and retrieved at the GFDC depots.

(b) Yam Storage Costs

Yam storage by traders was carried out by leaving the yam under sheds and in open space in the market under the care of watchmen. Traders kept yam in this way because of the absence of suitable storage facilities in the market. The average fee charged by a watchman at the time of the survey, was ¢100 per 100 tubers of yam per day.

4.6 Maize Processors' Costs

Processing is the market function concerned with changing the form of raw agricultural produce into forms which extend the shelf life of the product as well as adding value.

In the markets studied, no processed forms of yam were found. However, a processed form of maize, namely, corn dough, was found in large quantities, particularly, at the Mallam Ata market in Accra.

The main cost items of processing maize include: milling, labour, water for soaking the grains, and transportation. In addition to these costs, processors incur other costs such as market tolls and loading and unloading fees.

A miller processes an average of a 100kg bag of maize per week at a cost of ¢4,500 per bag. In all, about 180 litres of water is required for soaking the grain before milling and for mixing the corn flour into the dough. The average cost of water consumed for every bag of maize processed was ¢350. The total processing cost was estimated as ¢4,850 per bag.

Maize processors at Agormanya incur transport costs in moving the shelled maize from the market to their homes, usually in small lots by truck, and then from their homes to the cornmill and back by porterage. About 123kg of corn dough (15 baskets) are obtained from a bag of maize processed. The average cost of transporting maize from the market to homes averaged ¢270 per bag of 100kg weight. The cost of moving a bag of maize to the mill and back was estimated as ¢110. The cost incurred in transporting processed maize from Agormanya to Accra, a distance of 62 km, averaged ¢350 per basket. The total cost of transportation to the processor was ¢5,630.

The other costs of the processor, sundry expenses, were also estimated. The processors paid an average of ¢120 per basket for loading and unloading of the corn dough and an estimated average market toll per basket of ¢22.60, yielding a total cost of ¢142.60 per basket. The Sundry expenses of the maize processor totalled ¢2,139 per week. The average earnings of ¢3,329 per week for employees in agriculture, is also added to estimate the total processing cost per week (Table 4.8).

Table 4.8: Estimate of Maize Processing Costs (Cedis/bag)

Cost Item	Amount(¢)	%
Milling and Soaking	4,850	30.4
Transportation	5,630	35.3
Processor's Labour Cost	3,329	20.9
Sundry Expenses	2,139	13.4
Total Processing Cost	15,948	100
Total Processing Cost/kg	**129.7**	

Source **: Survey Data**

The total estimated cost incurred per week for processing 100kg bag of maize into corn dough, and transporting it from Agormanya to the Mallam Ata market in Accra is ¢15,948. This gives a processing cost of ¢129.7 per kg. Table 4.8 shows that transportation cost is the highest single contributor of the total cost of processing maize.

4.7 Sundry Expenses of Maize and Yam Wholesalers

Market operators or intermediaries who perform marketing functions of transportation, storage and processing incur other costs in the performance of these functions. These costs are referred to, in this study, as sundry expenses.

The maize and yam wholesaler's sundry expenses include income tax, loading and unloading charges, local buying agents fee or commission, Assembly or local council fees, stall rent, and market toll.

a. Sundry Expenses of Maize Wholesalers

The estimated sundry expenses of the maize wholesaler operating on the Nkoranza - Techiman route is ¢1,199 per bag (Table 4.9). These consist of loading and unloading charge of ¢300 per bag and agents' commission of ¢160 per bag. In addition, a local council fee of ¢200 per bag and an average market toll of ¢162 per bag are paid by the trader. The depreciated value of a jute sack is estimated as ¢300, determined by dividing the price of a jute sack by eight months expected life span of the jute sack.

Table 4.9 Sundry Expenses of Maize Wholesalers (Cedis/bag)

Cost Item	Nkoranza to Techiman	Techiman to Kumasi	Techiman to Accra
Loading and unloading	300	400	400
Depreciated cost of jute sack	300	300	300
Wholesaler's labour cost	55	55	55
Income Tax	22	22	22
Agent's fee	160	160	160
Market toll	162	162	162
Local Council	200	200	200
Total Sundry Expenses	**1,199**	**1,299**	**1,299**

Source: Survey Data

The itinerant maize wholesaler handles an average of 60 maxibags of maize per return trip and makes four return trips in a month. With an estimated average monthly earnings of ¢13,317 for the agricultural sector the labour cost of an itinerant maize wholesaler was estimated as ¢55 per maxibag of maize handled.

The itinerant maize wholesaler who purchases maize at the Techiman market for sale in Accra and Kumasi incurred the same sundry expenses of ¢1,299 per bag.

The estimates in Table 4.9 show that sundry expenses are lower for traders who move maize within the rural areas, due mainly to the abundance of labour leading to low loading and unloading charges per bag.

(b) **Sundry Expenses of Yam Wholesalers**

The yam wholesalers interviewed, paid an average income tax of ¢167 per 100 tubers of yam handled, with a range of ¢100 to ¢300. The loading and unloading charge per 100 tubers was ¢400 for both the Techiman - Accra and Techiman - Kumasi routes and ¢350 for the Bimbilla to Accra route (Table 4.10).

Yam wholesalers who employed agents to assemble their purchases from various locations in and around Bimbilla paid an average commission of ¢720 per 100 tubers. The average local council fee per 100 tubers was ¢335. The average quantity of yam purchased by the itinerant wholesaler on each return trip was 1200 tubers. Using the

average monthly earning per employee in agriculture, ¢13,317, as a proxy for the itinerant wholesaler's labour cost, a labour cost of ¢370 per 100 tubers of yam was obtained for the three return trips undertaken, by the itinerant wholesaler, in a month.

Table 4.10: Sundry Expenses of Yam Wholesalers (cedis/100 tubers)

Cost Item	Techiman to Kumasi	Techiman to Accra	Bimbilla to Accra
Loading and unloading	400	400	350
Income Tax	167	167	167
Agent's Fee	720	720	720
Market Toll	200	200	200
Wholesalers labour	370	370	370
Council Fees	335	335	335
Total Sundry Expenses	**2,192**	**2,192**	**2,142**

Source: Survey Data

The estimated sundry expenses per 100 tubers of yam totalled ¢2,192 for both the Techiman - Kumasi and Techiman - Accra wholesalers, and ¢2,142 for the Bimbilla - Accra wholesaler.

4.8 Costs and Margins of Maize and Yam Wholesalers

The wholesale marketing margins for trading in maize, yam and processed maize (corn dough) are computed from data collected during the survey. The gross margin represents the difference between the wholesale price and the purchase price of the commodity. The gross margin less the estimated marketing costs gives the profit margin on the commodity. Some useful indicators, such as, mark up on purchase price and Marketing Cost to Gross Margin ratios are also computed in the analysis.

(a) Costs and Margins of Maize Wholesalers

Transportation costs accounted for between 23.5 and 69.6 percent of maize wholesalers operating costs. Tables 4.1 and 4.11 indicate that itinerant maize wholesalers who move maize from Nkoranza to final markets in Kumasi (90km) and Accra (390km) incur transportation costs of ¢1,400 and ¢3,600 per bag, and total marketing costs of ¢4,098 and ¢6,298 per bag, respectively. This implies that transportation costs represent between 34.5 and 57.2 percent of marketing costs of traders who move maize from producing areas around Nkoranza to consuming centres such as Kumasi and Accra, respectively. Transport costs of itinerant maize wholesalers accounted for between 55 and 75 percent of the total marketing cost in the study by Oteng (1974), and between 53.72 and 57.37 percent in the Ghanexim (1991) study.

Table 4.11: Marketing Costs of Maize Wholesaling (cedis/bag)

Cost Item	Nkoranza to Techiman	%	Techiman to Kumasi	%	Techiman to Accra	%
Transportation	400	23.5	1,000	41.7	3,200	69.4
Storage	100	5.9	100	4.2	100	2.2
Sundry Expenses	1,199	70.6	1,299	54.1	1,299	28.2
Total Marketing Costs	1,699	100.0	2,399	100.0	4,599	100.0

Source: Survey Data

The analysis of the estimated marketing margins presented in Table 4.12 shows that the gross margin of ¢2,200 received by the wholesaler who moves a bag of maize from Nkoranza to Techiman, was made up of marketing costs, ¢1,699 (83.8%) and the wholesaler's profit margin, ¢501 (16.2%).

Table 4.12: Marketing Margins for Maize Wholesaling (cedis/bag)

Item	Nkoranza to Techiman	Techiman to Accra	Techiman to Kumasi
Wholesale Price(WP)	7,200	14,500	10,500
Purchase Price(PP)	5,000	7,200	7,200
Gross Margin(GM)	2,200	7,300	3,300
Marketing Costs(MC)	1,699	4,599	2,399
Profit Margin(NP)	501	2,701	906
MC as % of GM	77.2	63.0	72.7
NP as % of GM	22.8	37.0	28.3
GM as % of WP	30.6	50.3	31.4
MC as % of WP	23.6	31.7	22.8
PP as % of WP	69.4	49.7	68.6
NP as % of WP	7.0	18.6	8.6
Mark-up on PP	44.0	101.4	45.8

Source: Survey Data

The Techiman - Accra itinerant maize wholesaler who bought maize at the average price of ¢7,200 and sold in Accra at an average price of ¢14,500, had a gross margin of ¢7,300 per bag, or about 101.4 percent mark-up on the purchase price. This means that, by the time a bag of maize from Techiman reaches Accra, the price has increased by over 100 percent because of marketing costs.

The total marketing costs and purchase price as percentages of maize wholesale price (Table 4.12) indicate that between 22.8 and 31.7 percent of the maize consumer's cedis is taken up by marketing costs whiles between 49.7 and 69.4 percent goes to the maize farmer. Only between 7.0 and 18.6 percent of the maize consumer's cedi goes to the maize wholesaler. Marketing costs, however, accounted for between 63.0 and 77.2 percent of the maize wholesaler's Gross Margin.

(b) Costs and Margins of Yam Wholesalers

The estimated marketing costs of yam wholesaling are summarized in Table 4.13.

Table 4.13: Marketing Costs of Yam Wholesaling(cedis/ 100 tubers)

Cost Item	Techiman to Kumasi	%	Techiman to Accra	%	Bimbilla to Accra	%
Transportation	3,000	48.4	14,000	81.4	13,000	80.5
Storage	1,000	16.2	1,000	5.8	1,000	6.2
Sundry Expenses	2,192	35.4	2,192	12.8	2,142	13.3
Total Marketing Costs	6,192	100.0	17,192	100.0	16,142	100.0

Source: Survey Data

Table 4.13 shows that transportation costs accounted for between 48.4 and 81.4 percent of the marketing cost of the itinerant yam wholesaler. Transportation costs obtained by Ghanexim (1991) were about 65.53 and 88.90 percent of marketing costs for itinerant yam wholesalers who employed lake and road transport , respectively. Nyanteng (1969) also obtained a range of 62 to 75 percent for itinerant yam wholesalers and about 89 percent for farmers who transport yam from the farm to rural markets in Ejura and Amantin. Thus, transport cost is the most important component of the yam wholesaler's marketing cost.

A comparison of the transport cost as a percentage of marketing cost, estimated for yam and maize, shows that it is generally higher for yam than for maize. This high proportion of yam transport cost in marketing cost of yam could be due to its bulkiness in relation to its value. Again, storage cost, as was the case of maize, accounted for a small share of the yam wholesaler's marketing costs, ranging between 5.8 and 16.2 percent. Storage cost accounted for between 9.0 and 11.0 percent of marketing costs for maize wholesalers in the study by Oteng (1974).

The estimated yam wholesale marketing margins are presented in Table 4.14. The average wholesale price of 100 tubers of yam in the Techiman market was ¢45,000, and

¢80,500 in Accra with a gross margin of ¢35,500 or about 78.9 percent mark-up on the purchase price. The gross margin of the Techiman - Kumasi yam wholesaler was ¢17,500 per 100 tubers or about 38.9 percent mark-up on the purchase price.

Table 4.14: Marketing Margins for Yam Wholesaling (cedis/100 tubers)

Item	Techiman to Kumasi	Techiman to Accra	Bimbilla to Accra
Wholesale Price(WP)	62,500	80,500	80,500
Purchase Price(PP)	45,000	45,000	32,000
Gross Margin(GM)	17,500	35,500	48,500
Marketing Cost(MC)	6,192	17,192	16,142
Profit Margin(NP)	11,308	18,308	32,358
MC as % of GM	35.4	48.4	33.3
NP as % of GM	64.6	51.6	66.7
GM as % of WP	**28.0**	**44.1**	**60.2**
MC as % of WP	**9.9**	**21.4**	**20.0**
PP as % of WP	**72.0**	**55.9**	**39.8**
NP as % of WP	**18.1**	**22.7**	**40.2**
Mark-up on PP	38.9	78.9	151.5

Source: Survey Data

The purchase price of 100 tubers of yam in Bimbilla averaged ¢32,000 and the average wholesale price in Accra was ¢80,500. The estimated gross margin of ¢48,500 represents a 151.5 percent mark-up on the purchase price.

An analysis of profit margin of yam wholesalers shows that profit margins are higher for the wholesaler who sells in urban markets, particularly those located very far away from producing areas. This can be explained by the fact that these urban markets studied also serve as major consumer markets for the commodities, and as a result, demand for the commodities on these markets are generally high.

Table 4.14 indicates that at the wholesale level between 39.8 and 72 percent of the consumer's cedi goes to the farmer. Between 9.9 and 21.4 percent is taken up by marketing costs and between 18.1 and 40.2 percent represents the wholesaler's share in the consumer's cedi.

(c) Costs and Margins of Maize Processors

The processors purchased a bag of maize at an average price of ¢10,600, and the processed maize (corn dough) yielded ¢27,000. The profit margin of the maize processor, as shown in Table 4.15, was ¢452. Marketing margins of processors were computed using the cost estimates shown in Table 4.8.

Table 4.15: Marketing Margin for Processed Maize (cedis/bag)

Item	Amount
Wholesale Price (WP)	27,000
Less: Purchase Price (PP)	10,600
Gross Margin (GM)	16,400
Less Processing/Marketing Costs (MC)	15,948
Profit Margin (NP)	452
MC as % of GM	97.2
NP as % of GM	2.8
GM as % of GM	60.7
MC as % of WP	**59.1**
PP as % of WP	**39.2**
NP as % of WP	**1.7**
Mark-up on PP	154.7

Source: Survey Data

Processing and marketing costs of maize processors obtained from Table 4.8, represented 97.2 percent of the processor's gross margin. The high share of processing and marketing costs in the corn dough wholesaler's gross margin can be attributed to two factors. The first being the low conversion rates characteristic of food crop processing using traditional methods. This is evident from the fact that milling and soaking costs alone accounted for 30.4 percent of the maize processing costs (Table 4.8). The second factor is the high transportation cost which accounted for about 35.3 percent of the processing costs. Other factors which could possibly account for the high processing costs are the few corn millers in the corn dough producing areas, high cost of electricity, as well as, high cost of spare parts.

The results in Table 4.15 indicate that only 1.7 percent of the consumer's cedi goes to the maize processor at the wholesale level, with as much as 59.1 percent being taken up by processing costs. The results also show a high mark-up of 154.7 percent on purchase price of the commodity.

4.9 Financial Requirement for Transportation, Storage and Processing

The marketing costs and margins of middlemen performing the physical activities, viz., transportation, storage and processing, were estimated with the objective of finding out the financial requirements for the activities.

A summary of the financial requirements of wholesalers is presented in Table 4.16. Table 4.16 shows, among others, that a maize wholesaler who purchases an average of 60 bags of maize at ¢7,200 in the Techiman market for sale in Accra (390 km) requires ¢432,000 for maize purchases per trip, and incurs a transportation cost of ¢192,000. In addition, a maize wholesaler requires ¢77,940 to meet sundry expenses and also pays an average of ¢6,000 to watchmen in the Techiman and Accra markets, for an average of 5 days. This translates to a financial requirement of ¢707,940 per trip or ¢117,990 per tonne of produce.

The total expenses of the itinerant wholesaler who moves an average of 1,200 tubers of yam, over a distance of 390 km from Techiman to Accra, was ¢746,304 per trip or ¢221,114 per tonne of produce.

From the analysis, the itinerant wholesaler requires ¢707,940 and ¢746,304 per trip to be able to move maize and yam, respectively, from the main producing areas of Techiman to Accra. A breakdown of the financial requirements showed that itinerant wholesalers required between ¢168,000 and ¢192,000 for transportation.

Storage was not a significant activity in wholesale trade in the country. The storage costs were ¢12,000 and ¢6,000 for yam and maize , respectively, for the average of 1200 tubers of yam and 60 bags of maize handled on each trip.

Table 4.16: Summary of Maize, Yam and Corndough Wholesalers expenses (cedis/trip)

Item	Maize Wholesaler (60 bags)	Yam Wholesaler (1200 tubers)	Corn dough (1 bag of processed maize)
Purchases	432,000	540,000	10,600
Transport Costs	192,000	168,000	5,630
storage Costs	6,000	12,000	-
Processing Costs	-	-	4,850
Sundry Expenses	77,940	26,304	2,139
Total	707,940	746,304	23,219

Source: Survey Data

The low financial requirement for yam and maize storage, however, results from the absence of proper storage facilities in the markets which does not allow traders to undertake any appreciable storage.

The maize processor also required financing of about ¢23,219 per week. The cost of processing a bag of maize was estimated as ¢4,850. Transportation and other costs averaged ¢7,769 for a bag of maize processed at Agormanya and sold in the Mallam Ata market in Accra.

In summary, Table 4.16 shows that the itinerant maize or yam wholesaler required between ¢180,000 and ¢198,000 to undertake the physical functions of transportation and storage per trip. In all, the itinerant maize and yam wholesaler required ¢707.940 and ¢746,304, respectively, to undertake the exchange (buying and selling) and physical functions of agricultural marketing. This was financed from the trader's own capital or borrowed money. The mode and sources of financing the physical activities are discussed in Chapter 5.

CHAPTER FIVE

5. FINANCING THE PHYSICAL ACTIVITIES OF AGRICULTURAL MARKETING

Among the widely cited constraints of agricultural production and marketing is finance (FAO, 1965, Opoku-Owusu and Tetteh, 1971, Addo, 1976, La-Anyane, 1985, Kwadzo, 1990, Asuming-Brempong, et al., 1991, and Von Pischke, 1991). Asuming-Brempong, et al (1991) reported that about 70 percent of traders interviewed indicated inadequate financing as their major constraint. In the present study, about 82.5 percent of the respondents mentioned inadequate financing as constraining their ability to expand their operations. The shortage of credit is therefore, one of the major bottlenecks of agricultural marketing in Ghana.

The existing shortage of credit for agricultural marketing is evident from the high and often usurious interest rates charged by the highly patronised informal financial sector. An IBRD (1975) report indicated that access to formal agricultural credit has been biased in favour of large agricultural operations.

In Ghana, though the MOA (1990) has reported that small-scale farmers access to credit has increased from 7 percent of loanable formal sector credit in 1975 to 40 percent in 1986, there are substantial evidence which point to the contrary. Commercial banks' credit to the agricultural sector declined from ¢18.7 million in 1983 to about ¢12.6 million in June, 1991, showing a decline of about 32 percent (BOG, 1991). The shortage of credit to the agricultural sector is not only evident in the low volume and declining proportion of commercial banks' credit, but also in the declining numbers of money lenders. The number of licensed money lenders declined from the 1982 figure of 10 to 2 in 1989 (Table 5.1)

Table 5.1: Number of Licensed Money Lenders in Accra

Year	1982	1983	1984	1985	1986	1987	1988	1989
Number	10	6	3	5	3	5	4	2

Source: License Office, (1994) , Ghana Police Service (GPS).

5.1 Sources of Finance for Transportation, Storage and Processing

Sources of finance available to market operators for the performance of the physical activities or agricultural marketing in Ghana included the informal sources-: friends and family members, money lenders, traders, susu clubs, credit union, farmers, and transporters and the formal sources - commercial banks, development banks and rural banks. In addition, a large number of market operators financed their activities from their own resources.

This section examines the finance of transportation, storage and processing in relation to:

1. Sources of Finance
2. Credit Procedures and Requirements
3. Loan Amounts
4. Interest Rates
5. Repayment Periods

Tabsoba (1981) reporting on a study in the eastern Upper-Volta (now Burkina-Faso) indicated two types of informal lenders at town and village levels similar to those identified in studies on Ghana by La Anyane (1985). The non-commercial lenders who lent primarily to family members and friends, and the commercial lenders who lent primarily within a town or village and to a few people from neighbouring locations. In Ghana,

informal lenders play a vital role in financing agricultural marketing. They provide loans to the market operators at short notice, often demand little or no collateral, and tend to place few, if any, restraints on funds utilisation. However, the average amount of loan given is very small. Information from the survey show that the volume of credit available to market operators, from informal sources, averaged about ¢327,158 with a range of between ¢33,000 and ¢7,000,000. Informal lending is, however, characterised by a much shorter processing time, demand for little or no collateral, and simple screening techniques.

The formal sources of finance, on the other hand, consist of banking and non-banking financial institutions comprising of the Bank of Ghana, 5 commercial banks, 3 development banks, 7 merchant banks, 126 rural banks, and 10 non-bank financial institutions. From the study, it was observed that institutional credit was not used by most of the 302 respondents interviewed. Only 18 percent of the respondents used credit from commercial banks. About 76.7 percent of the total respondents had never applied for bank loans and 5.3 percent had their applications declined. Credit from formal sources, averaged ¢550,315 and ranged from ¢200,000 to ¢3,000,000.

Market operators interviewed in the study, employed two main sources of finance - equity and borrowed capital - in performing the physical activities of agricultural marketing. Of the 302 respondents, 150 used their own capital (equity), while 152 employed borrowed capital to finance the physical activities, as shown in Table 5.2.

About 53 percent of the 62 market operators who undertook the storage activity used their own capital, 24 percent borrowed from other market operators, about 9.7 and 6 percent borrowed from money lenders and banks, respectively. For the remaining 6 percent the main source of finance for the storage activity was friends and family members. About 55 percent of the 264 respondents who undertook the transportation activity, financed it from their own resources. Nineteen percent (50) used borrowed capital from the banks, 12.8 percent (34) borrowed from money lenders and the remaining 13.2 percent borrowed

from other market operators (10%) and from friends and family members (3%).

Table 5.2: External Sources of Financing for Transportation, Storage and Processing and their Major End Use.

ACTIVITY	EXTERNAL SOURCES OF FINANCE				TOTAL
	Family/Friends	Transporters/Traders/Farmers	Money-Lenders	Banks	
Storage	4	15	6	4	29
Transportation	7	27	34	50	118
Processing	1	4	0	0	5
Total	12	46	40	54	152

Source: Survey Data

Market operators who process maize finance their activities mainly from their personal resources (86%). Other sources of finance for the processing activity were market operators (11%) and friends and family members (3%). The source of finance, presented in Table 5.2, shows that market operators performing the physical activities of agricultural marketing rely on their own resources, which include income from the sale of land, livestock and other personal belongings, for the financing of the activities. This could be a result of mitigating factors such as prohibitive minimal interest rates and bureaucratic delays associated with the informal and formal sectors, respectively.

Information gathered in the survey showed that market intermediaries in Ghana have various reasons for not making efforts to obtain credit from the banks. The usual reasons mentioned by most of the market operators or intermediaries were that, the banks may not grant their requests, even after the long and time consuming bureaucratic procedures they will have to go through. Some also mentioned collateral as prohibitive. Some traders who obtained credit from the Agricultural Development Bank in Techiman had to deposit between 10 to 25 percent of the loan amount with the bank, as collateral requirement for the loan. Cost is incurred on this deposit, which is not available to the borrower, thereby increasing the effective interest rate on the actual amount borrowed.

There is a high patronage of the informal financial market, despite the maintenance

of nominal interest rates higher than that prevailing in the formal sector. Some market operators interviewed in the survey paid interest rates ranging between 0 and 250 per cent per annum on money borrowed from money lenders. However, the demand for collateral and the long and time consuming procedure in loan approved and delivery in the formal sector is what probably contribute to the high patronage of the informal sector.

The informal sources of financing, which pre-date the commercial sources, were expected to lose their significance through an increasing level of modernisation of the economy. However, due to the time consuming and complex loan processing procedures of the formal sector and demand for collateral, among others, the informal sources, despite charging exorbitant nominal interest rates, enjoy a high level of patronage from the market operators.

There is little or no formal screening of borrowers and there is virtually no conditions attached to credit obtained from sources other than the banks. The informal sources, however, charge high nominal interest rates to compensate for the high risk, and give only short term loans.

A summary of the source of financing and interest rates charged per annum is presented in Table 5.3.

Of the 152 respondents who used some form of external finance, about 53 percent were charged interest rates ranging from 16 to 30 percent per annum, and 25 percent were charged interest rates of between 31 and 100 percent per annum. For about 6.6 percent, the interest rates charged were between 101 and 250 per cent per annum. About 14 percent paid interest rates of less than 15 percent per annum.

Table 5.3: Source of Financing and Interest Rates

Source of Financing	Nominal Interest Rate (% per annum)				Total
	0 - 15	16-30	31-100	101-250	
Family/Friends	9	3	0	0	12
Transporter/ Traders/Farmer	9	31	2	4	46
Money Lenders	0	8	26	6	40
Banks	2	42	10	0	54
Totals	**20**	**84**	**38**	**10**	**152**

Source: Survey Data

Nominal interest rates charged by the Banks usually ranged between 16 and 30 percent per annum, with a few market operators being charged as high as 35 percent per annum. Money borrowed from family and friends were found to be the cheapest with the interest rate generally below 30 percent per annum. However this source of finance was found to be unreliable, since such sources have limited cash, mainly from personal resources.

It was observed that family relations and friends sometimes charged exorbitant interest rates. Some of the traders who borrowed working capital from friends paid no direct interest but paid a third of the profits to them. The true cost of the loan could be very high in this case.

A summary of the source of financing and the repayment period is presented in Table 5.4.

Table 5.4: Source of Financing and Period of Repayment

Source of Financing	Period of Loan (months)					Total
	up to 3	up to 6	up to 9	up to 17	18 +	
Family/Friends	0	3	7	2	0	**12**
Transporters/ Traders/Farmers	37	2	5	1	1	**46**
MoneyLenders	28	6	3	3	0	**40**
Banks	4	27	9	9	5	**54**
Total	**69**	**38**	**24**	**15**	**6**	**152**
Percentage	**45.4**	**25.0**	**15.8**	**9.9**	**3.9**	**100**

Source: Survey Data

About 45.4 percent of the loans were advanced for a period not exceeding 3 months, 25 per cent were advanced for periods of up to 6 months, about 15.8 percent were to be repaid between 7 and 9 months, about 9.9% of the loans were to be repaid between 10 to 17 months, and the remaining 3.9 percent had credit facilities with repayment period of 18 months and more. Thus, the market operators' access to medium- to long-term financing is quite limited, making it difficult for them to undertake long-term investments.

The costs incurred by market operators performing the physical activities are used in a Benefit - Cost analysis of the activities (Appendix 10).

The analysis in Appendix 10 shows that for a market operator to own and operate transport and storage facilities, and also undertake the other marketing functions, medium- to long-term credit facilities would be required, possibly from the formal financial sector. This is, particularly, important when viewed against the background that about 86.2 percent of those who received credit had to repay within 9 months.

Market operators performing the physical functions of agricultural marketing, therefore, complement one source of credit with another, since the volume of credit obtained from any one source is usually very small and inadequate for the performance of the physical activities

5.2 Characteristics of Market Operators Affecting their Borrowing Capabilities

In addition to the problem of agricultural credit shortage, certain existing characteristics of market operators affect their borrowing capabilities decisively. These characteristics are:

1. Market operators tend to operate as individuals and not as a group. Even where market organisations exist; the groups are formed for credit purposes, and are often initiated by market "queens" and leaders, and outside agencies such as banks and non-governmental organisations. Thus, individuals group members are sometimes not involved in the process of applying for credit, and therefore do not feel a sense of responsibility for repayment of credit, leading invariably to defaults and disintegration of the group.

2. Itinerant maize and yam wholesalers were also observed to borrow from different sources for on-lending to farmers, to guarantee future supplies of produce. As such, in the event of poor yield or any disaster befalling the farmer, the itinerant maize and yam wholesalers are unable to repay the loan thus reducing their credit worthiness.

3. Most market operators are females, often middle-aged , with low education, and have little knowledge about the lending activities and requirements of the formal financial market.

4. Limited asset-diversification opportunities for market operators, result in the lack of acceptable collateral such as fixed deposits, bills ,bonds and notes as well as real estate for the acquisition of institutional credit.

The above characteristics of market operators, can affect their ability to acquire credit from, particularly, the formal sector.

5.3 Linkages in Maize and Yam Marketing Finance

The present survey on the financing of the physical activities brings to the fore, certain linkages existing in the finance of maize and yam marketing in Ghana. A schematic representation of the linkages observed in the survey is presented in Figure 5.1.

The linkages are discussed in relation to the purpose of the credit, the volume of credit extended and interest rate charged, among others.

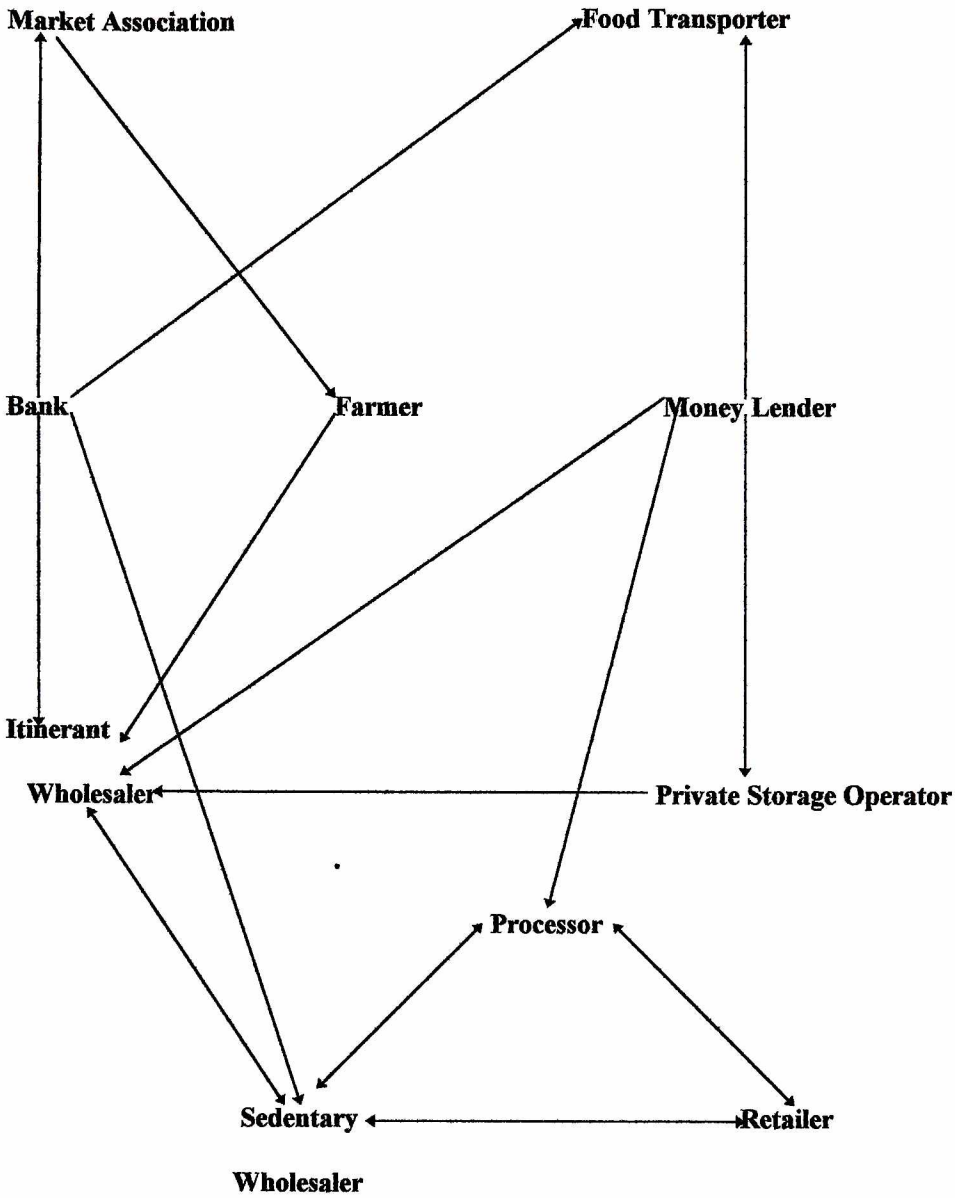
The wholesale traders (itinerant and sedentary) interviewed in the survey finance their activities with funds borrowed from the family, money lenders, banks, friends, and other relatives. Some of the itinerant wholesalers pool their personal financial resources together and lend to one another. Credit from these sources is usually cash for purchases. Some of the itinerant wholesalers, however, purchased their products on credit from the farmers or use loans from market associations. Usually itinerant wholesalers who pool their financial resources take turns in the use of the money, and share profits.

Some of the itinerant wholesalers received credit from transporters, in the form of deferred transport charge payment effected after sale of the commodities.

No credit linkage was, however, observed between the traders (sedentary and itinerant) and watchmen who keep watch over produce left in the market. Some of the traders were however allowed, by private storage agents, to store produce in their storage rooms, with payments being effected after the sale of the commodities.

The itinerant wholesalers sometimes provided credit to transporters in the form of cash to meet operating expenses. In addition to financing the physical activities, some itinerant wholesalers also provided credit to farmers usually during planting, under conditions which can best be described as "forward" buying of the farmers' produce since the farmers are under obligation to sell their produce to the respective wholesalers at a previously agreed price.

Fig. 5.1 Credit Linkages in Agricultural Marketing



Market wholesalers also financed the activities of retailers by selling produce to them on credit, and at the prevailing wholesale price of the product, thereby excluding any interest charges. Credit extended by market traders were for very short-term with about 69 percent extending credit, for less than a month.

Processors also obtain credit from transporters, banks, money lenders and wholesale traders for their activities. They in turn provide credit to itinerant and sedentary wholesalers, for the payment of the cost of transporting the maize.

5.4 Problems of Financing Agricultural Marketing

(a) Formal Sector

The poor performance of the formal sector in financing agricultural marketing could be attributed to the numerous problems facing the sector.

Reviewing the past and present experiences with agricultural marketing credit in Ghana, the following problems emerged:

1. Inadequate savings mobilisation for lending.
2. High loan delinquency
3. Poor appraisal, supervision and monitoring of credit by the banks
4. Lack of innovative credit policies and programmes.
5. Unfavourable fiscal and monetary policies.

Inadequate savings mobilisation by the formal financial sector has greatly affected its ability to finance agricultural marketing since banks primarily finance loans and advances from savings mobilised.

Table 5.5 shows that in 1994, total loans and advances to the agricultural sector accounted for between 47.4 and 68.5 percent of development banks' deposits. The Agricultural Development Bank (ADB) which lends about 68.5 percent of its advances to the Agricultural sector, for example, mobilised only 5.8 percent of the total banking deposits. In 1991, ADB mobilised only 2.8 percent of the total banking deposits (Owusu-Ansah, 1993).

Table 5.5: Key Ratios for some Development Banks in Ghana - 31/12/94 (percent)

Bank	Share of Bank in total Bank Deposits	Loans & Advances to Agric. Sector/ Deposits	Loan Loss Provisions/ Loans & Advances	Loan Loss Expenses/ Income
Agric. Dev. Bank (ADB)	5.8	68.5	9.8	13.7
Bank for Housing & Construction (BHC)	2.8	65.5	41.4	5.2
National Investment Bank (NIB)	3.6	47.4	17.9	10.0

Source: Price Waterhouse Associates (1995).

The problem of inadequate savings mobilisation could be attributed to the lack of confidence in the formal financial sector. The results of this study showed that only about 22.8 percent of the respondents reported saving with the banks. About 10. 9 percent

saved with "susu" club, while 11.5 percent saved with credit unions (Table 5.6).

About 45.3 percent of the respondents kept their monies only at home, 22.8 percent with banks, 11.5 percent with credit unions and 10.9 per cent with "Susu" clubs. Of the remaining, 6.2 percent kept their monies at home and with the banks, 2.3 percent saved with the banks and "susu" clubs, and 1.0 percent kept their monies at home and at the Bank.

Table 5.6: Place of Savings by Market Operators

Place of Savings	No. of Respondents	Percent (%)
At Home	137	45.3
Bank	69	22.8
Credit Union	35	11.5
Susu	33	10.9
Susu and Bank	7	2.3
At Home and Susu	3	1.0
At Home and Bank	18	6.2
TOTAL	**302**	**100.0**

Source: Survey Data

A further evidence of the low savings mobilisation resulting from the lack of confidence in the formal sector is that, while the number of people operating deposit accounts may have been rising ,though at a reduced rate, depositors do not seem enthusiastic about increasing the size of their deposits. Between 1987 and 1988, the average deposit per rural bank in Ghana increased by only 13.8 percent while the number of account holders went up by 20.4 percent (BOG, 1988).

Another problem which has greatly hampered the activities of the formal financial sector is high loan delinquency, particularly, in agricultural lending. The high rate of loan default has resulted in most of the formal financial institutions having large non-performing portfolios. This has adversely affected the ability of the formal financial institutions to extend credit, since large loss provisions have to be made for delinquent loans. Table 5.4 shows that loan loss provision as a ratio of total loans and advances for the three development banks (ADB, BHC and NIB), actively engaged in agricultural sector lending ranged between 9.8 and 41.4 percent for 1994 whilst agricultural lending rates remained below 40 percent in all the three development banks. Loan loss provision also accounted for between 5.2 and 13.7 percent of interest income of the banks.

The high rate of loan default can be attributed to weak credit management, lack of follow up on overdue facilities, and slow legal procedures for loan recovery, among others.

The failure of agricultural lending institutions to adequately finance the agricultural sector has also been attributed to the lack of innovative credit delivery policies and mechanisms (Yaron, 1994). According to Jacob Yaron, most of these lending institutions have become mere disbursement windows and that existing credit programs have reached only a minority, often the wrong minority of the rural population, with large volumes of credit going to those not actively engaged in agriculture.

The issue of concessional lending rates for agriculture under government directive were also found to be counter productive. Lending rates for agriculture are usually low and inadequate to compensate for high risks and administrative costs of lending. This accounts for the unwillingness of the formal financial sector to lend to the agricultural sector operators.

Weak regulatory framework governing operations of financial institutions has, also, resulted in the establishment of many short-lived formal and informal financial institutions. The apparent insolvency of these "wonder" banks have tended to further erode

the confidence of the general public in the existing financial institutions. The absence of strong legal framework has also compounded the difficulties of loan recovery by the formal and informal sector.

Poor bank supervision has contributed to high loan delinquencies. Bank supervisors, usually with very little experience in risk management, are unable to provide early warning signals on the quality of existing portfolios, and often overlook long term risk management issues. The lack of proper central bank supervision has also resulted in improper classification of loans by banks, making it impossible for adequate provision to be made for loan losses.

Finally, the absence of appropriate fiscal and monetary policies for the efficient operation of financial institutions has greatly affected their performance. The existing annual corporate tax rate, imposed on banks by the Government of Ghana, is 45 per cent. Annual corporate tax for all other sectors of the economy, excluding agriculture, is 35 percent. To provide a favourable fiscal policy for the formal sector, the high corporate tax for banks should be revised downwards. The maintenance of a high tax rate for the banking industry takes away potential loanable funds, which may have ended up in the agricultural sector, and therefore maize and yam marketing finance.

(b) Informal Sector

The informal financial sector, which accounts for about 64.5% of the external sources of finance for storage, transportation and processing of maize and yam has several problems, despite the high patronage of the sector.

The problems observed from a review of informal sector lending include:

1. Low volume of credit
2. High interest rates

3. Lack of legal and regulatory framework

4. Poor documentation of agreements.

Informal sector credit to market operators, interviewed in the study, averaged about ¢327,158. From the study, one of the main reasons which seemingly accounts for the low volumes of credit from the informal sector is the availability of loanable funds. Informal sector lender's extend credit from their meagre resources which include their personal savings, working capital from their trade and borrowing from other sources. Moreover, most informal sector operators have little or no access to reliable sources of credit, such as formal sector loans. High interest rates exist in the informal sector, partly as a compensation for the high risk involved in informal sector lending and as a result of imperfections in interest rate determination by the informal sector. The prevalence of high interest rates in the informal sector, however, discourages borrowing thereby affecting the performance of the physical activities of agricultural marketing. Informal lenders charge nominal interest rates of up to about 250 percent per annum on borrowed capital which is high compared to formal sector rates of between 15 and 30 percent. The cheapest sources of informal sector credit - friends, family and other market operators - charge interest rates below 30 percent per annum. Interest rates charged in the informal sector, such as moneylender's ranged between 16 and 250 percent. About 65 percent of market operators who obtained loans from moneylenders paid interest rates of between 31 and 100 percent

Although the informal sector plays a vital role as a reliable source of finance for the performance of the physical functions of agricultural marketing, it has not operated effectively due to the non-enforcement of existing legal and regulatory framework for their operations. Informal sector lenders such as moneylenders and susu clubs are required by law to obtain licence from the Ghana Police Service (GPS) for their operations. However, from casual observation, this regulation is not complied with by most money lenders

operating in the villages. The absence of adequate legal and regulatory framework to govern and protect informal sector lenders makes it difficult for informal lenders to extend large volumes of credit.

Another constraint faced by informal sector lenders concerns the quality of credit recovery agreements and their documentation. Market operators in the study complained about non adherence to agreed conditions by informal lenders. Informal lenders increase interest rates on borrowed capital without tangible reasons, while others demand repayment of borrowed capital before the agreed due dates. None of the 98 respondents, who obtained some form of informal sector credit, were required to sign any document indicating their commitment to the lenders. Agreements between formal lenders and borrowers are mainly verbal, making legal interpretation and enforcement of such agreements very difficult.

CHAPTER SIX

6. CONCLUSION AND RECOMMENDATIONS

6.1 CONCLUSION

The study has reviewed the physical activities and channels of maize and yam marketing in Ghana, and estimated the marketing cost and margins as well as the financial requirements for performing the physical activities. The study also examined how the costs are financed. In addition, the study reviewed the major problems associated with formal and informal sector financing or agricultural marketing activities in Ghana.

Marketing of maize and yam in Ghana was observed to be a purely private sector activity, dominated by women. The maize and yam marketing system for the selected markets in Ghana was observed to be generally competitive with price formation depending largely on the forces of demand and supply. There were, however, commodity specific market "queens" or leaders who engage in some price determination activities and also impose some barriers to entry on, particularly, itinerant and sedentary traders operating in the markets. Markets in Ghana were generally observed to lack proper storage and warehousing facilities. They also lacked stalls and sheds, and parking space and platforms, for loading and unloading of agricultural commodities. The markets were, generally, without good drainage systems and proper ventilation. Standardisation, a facilitating function which reduces risk faced by market participants (viz., farmers, market operators, and consumers) was not properly undertaken in the markets. The units of measure were found to vary considerably from market to market. Yam was wholesaled in units of 100 tubers irrespective of their weights, and maize was measured using different containers. Grading of maize and yam into categories was rudimentary. Yam was sorted on the basis of variety and size.

Traders relied on transporters and fellow traders for market information. Use of market information disseminated through the broadcasting and print media was not common with traders.

The review of existing maize and yam marketing channels showed that at the initial point of production, there exists village based local buying agents who assemble crops for itinerant traders and charge commissions on quantity assembled. The itinerant traders then arrange for transportation to haul the produce from the various assembly points, usually on poor condition roads to their markets. Maize and yam are then wholesaled to sedentary or market based traders who also sell to institutions and the general public or the ultimate consumers. Itinerant and sedentary traders, sometimes, wholesaled the commodities to processors and feed mills for processing into poultry feed, corn dough and kenkey.

The marketing channels of maize were very complex, unlike that of yam which were quite simple, involving fewer intermediaries. Storage of agricultural commodities occurred only when some of the products meant for a particular market day are left unsold. Only about 2 percent of the traders ever stored produce in the GFDC silos, which were generally located some distance from the market. The products were usually left in the open under the care of watchmen or kept in privately owned storage rooms in the markets.

The marketing costs estimated in the study indicate that transport costs ranged between 23.5 and 81.4 percent of the total marketing costs for maize and yam wholesalers and 35.3 percent for maize processors. Estimates obtained in the study showed that transport costs account for between 23.5 and 69.6 percent of the maize wholesaler's marketing cost and between 48.4 and 81.4 percent of the yam wholesaler's marketing cost. The marketing costs were also generally higher for traders who operated in urban markets. Transport costs per tonne - km were high using human portage and tractors, and also high on poor condition roads. The transport costs per tonne-km were also higher for yam than maize. This was probably because, unlike maize which is packaged in jute sacks before transportation, there is no packaging of yam during transportation. Transportation costs were also higher for commodity transportation by portage, than by trucks.

Yam and maize wholesalers do not undertake processing of the commodities they

trade in. Storage costs were very low and accounted for between 2.2. and 5.9 percent of maize marketing costs and between 5.8 and 16.2 percent of yam marketing costs.

Inadequate operating capital and access to credit were the major constraints affecting the performance of the physical functions in the marketing system. The financial requirement of yam and maize wholesalers averaged about ¢746,304 and ¢707,940 per trip, respectively. In the case of the yam wholesaler, this included the cost of purchasing the commodities (¢540,000), transportation (¢168,000), storage (¢12,000) and sundry expenses (¢26,304). Similarly, the financial requirements of the maize wholesaler included the cost of purchasing (¢432,000), transportation (¢192,000), storage (¢6,000) and sundry expenses (¢77,940).

The inability of market operators (maize and yam wholesalers, transporters, processors and private storage operators) to adequately finance their activities can be attributed in part to inadequate availability of agricultural credit. This was evidenced by the high interest rates charged by the highly patronised informal financial sector.

Identified sources of credit to market operators were, among others, family and relatives, friends, money lenders, farmers, banks and other market operators. The volume of credit, obtained by market operators, from the various sources was very small relative to their credit needs. To obtain adequate funds the market operators borrow from several sources. The volume of credit available to market operators, from informal sources averaged about ¢327,158 with a range of ¢33,000 to ¢7,000,000 whereas credit from formal sources averaged ¢350,315 with a range of ¢200,000 to ¢3000,000.

Projected cash flow analysis of how market operators in maize and yam trade finance their credit needs showed that the period for the repayment of loans were usually very short for any significant return to be made from use of the credit.

Moneylenders charged interest rates as high as 250 percent per annum (20.8% per month). Credit from family and relatives, friends, and other market operators generally

attracted zero or very low interest rates. The formal sector lenders like the banks however charged interest rates between 15 and 35 percent per annum.

The growing patronage of the informal money markets despite the high interest rates is a result of the time consuming bureaucratic procedures and requirements of the formal markets, among others. Market operators financed by the formal sector are required to provide collateral for the loan. In some instances, savings deposits of between 10 and 25 percent of the loan amount were demanded by formal sector lenders, as collateral for the loan.

In addition to these problems of delays and collateral requirements, certain characteristics of market operators also adversely affect their borrowing capabilities. The market operators were mostly middle-aged (31 and 50 years - 66.9%), with little or no formal education, and had virtually no knowledge on the operations of the formal financial sector. As many as 46.6 percent of the respondents had no formal education, whiles only 37.4 per cent had formal education up to the middle school level (i.e. 10 years of formal education).

As a result of the problems explained above, 76.7 percent had never applied for formal sector (bank) loans. About 49.7 percent of them financed their physical activities from their meagre personal resources and from the sale of personal properties, such as livestock, vehicles and land. Only about 18 percent were financed by the formal sector, whiles 32.5 percent were financed by the informal sector. About 5.3 percent had their applications declined.

The study also examined the operations of the formal and informal financial sector to find out the problems which affect their ability to finance agricultural marketing.

A review of the credit delivery mechanisms of formal financial institutions showed that, in an attempt to improve on their loan recovery and administration, certain customer screening procedures were put in place which did not only increase the length of time

required to process credit applications, but also frustrated market operators who wanted to borrow from the formal sector . Borrowers from the agricultural sector are made to go through discriminative procedures, since most of them do not possess acceptable collateral demanded by the formal sector. Market operators are sometimes required to be introduced by their market queens or community leaders before being considered for credits. Those who provide personal guarantors, as a form of collateral, are unduly delayed since their guarantor's background must be investigated by the lending institution.

Also, as a result of poorly designed and implemented credit delivery and administration mechanisms, most of the banks have ended up with non-performing portfolios, particularly, for the agricultural sector. In addition to the problem of poor credit delivery, the inability of the formal sector to adequately finance agriculture in general is also caused by problems such as, poor banking supervision, inadequate credit information gathering and dissemination, slow enforcement of legal agreements on credits, lack of skilled personnel, high bank tax rates, weakened public confidence in the banks and maintenance of high reserve ratio.

6.2 RECOMMENDATIONS

Reviewing the problems of financing the physical activities of maize and yam marketing in Ghana, it becomes apparent that, any strategy to reduce marketing costs of the selected commodities and improve on the financing of the physical activities should include:

(a) Improvement of credit delivery and recovery mechanisms.

(b) Provision of enabling legal and regulatory environment.

(c) Increased mobilisation of domestic savings.

(d) Transportation infrastructure development.

(e) Storage infrastructure development.

(f) Development of physical market infrastructure.

(g) Standardisation and grading of agricultural commodities.

(h) Improvement of market information collection and dissemination.

These recommendations can also be extended to agricultural commodities with similar biological, socio-cultural and economic characteristics.

(a) Credit Delivery Mechanisms

Credit delivery mechanisms are crucial to the success of agricultural marketing finance. To address the problem of poor credit delivery it is recommended that an improvement of the credit delivery mechanisms of formal financial institutions be undertaken through :

1. Reducing the time for the processing of applications by shifting the responsibility of identifying market operators to community leaders and market "queens" and commodity associations.
2. Lending through well constituted commodity or activity specific small market groups with tangibly demonstrated commitment to long term cohesion and self-help.
3. Lending through organised informal sector lenders like money lenders, susu clubs and credit unions, who have collateral and are willing to bear the risk of default, at negotiated interest rates, to market operators who have limited opportunity for asset-diversification. The banks can lend at, say, a 5 percent points reduction in lending rates to the informal lender who can then lend to market operators by adding about 10 percentage points. This would help reduce the high interest rates charged by the informal sector.
4. The responsibility of banks, to educate borrowers on credit

management and repayment, could be given to experienced non-governmental organisations (NGOs) and other agencies.

5. Formal financial institutions should provide adequate training opportunities to improve on the skill of bank staff in project identification, appraisal, supervision and monitoring, and loan documentation.
6. Formal financial institutions should also increase follow-ups on customers, since informal lender, such as money lenders, are able to improve on their recoveries through frequent contact with their customers.
7. The banks should also employ the services of external solicitors to help enforce legal agreements on credits as a way of reducing over reliance on their usually few, internal solicitors.
8. Formal financial institutions should establish internal units to recover problem loans.

(b) Enabling Legal and Regulatory Environment

The ability of the formal and informal financial institutions to finance the physical activities of agricultural marketing is unlikely to be enhanced without a significantly improved environment under which reduced lending risks and improved operational efficiency can be achieved.

The role of the Bank of Ghana (BOG) in the proper supervision of the general credit operations of formal financial institutions is vital for the improvement of credit management and administration. The BOG should supervise and ensure compliance with the provisions of the Banking Law (PNDC L225,1989) as regards capital requirements.

The BOG could also collect and disseminate credit information obtained from Banks, pertaining to the credit worthiness of borrowers in order to encourage the formal financial institutions to engage in consortium lending, for the financing of the physical activities, such as, acquisition and operation of commodity transport vehicles. The government should also encourage Commercial Banks to lend to the agricultural sector by downwardly revising the high bank tax rate of 45 per cent.

The banks could promote public confidence through, strict adherence to the Banking Secrecy Provision of the Banking Law. The role of the informal financial sector could be strengthened through financial support and the provision of a legal framework for their operations. This would help increase their coverage, and minimise fraud. The government could, by legislature, establish a Banking Ombudsman, as pertains in the United Kingdom, to hear complaints from Banks and their customers concerning the breach of the Banking Law (PNDC L.225) and Banker-customer contracts. This would help reduce time involved in seeking redress from the courts.

(c) Mobilisation of Domestic Savings

The existing potential for domestic savings mobilisation can be relied on to build the self-financing capability of the market operator.

Susu collectors can be organised and provided with a legal framework for their operations. The susu collectors would then be able to provide credit to market operators, at short notice, and enforce repayment through deductions from daily deposits made by the market operators.

Secondly, the formal sector can also employ a mobile savings system to collect the small daily savings of market operators, in their various markets of operation. This would help improve the problems of inadequate savings mobilisation, facing the banks.

(d) Transportation Infrastructure Development

Lack of transportation infrastructure has contributed to the high marketing cost incurred by market operators. Transport cost were higher for the movement of agricultural commodities by human porterage and on poor roads. Recommendations for the development of transportation infrastructure in Ghana, therefore, includes :

1. Rehabilitation and maintenance of existing feeder roads, and construction of new roads. Construction of feeder routes and farm access roads will enable itinerant traders to go directly to the farms to buy and transport their purchases. This would reduce the high transport cost of using human porterage as well as, the number of intermediaries in the marketing channel.

2. Improvement of rail and lake transport systems. Extension of rail transport beyond Kumasi to producing centres like Techiman would help reduce transport cost. Similarly, since lake transport offers a cheap mode of transportation, ports could be constructed at the major producing centres along the Volta Lake to improve access of traders and farmers to lake transport.

3. Human porterage is slow, risky and expensive. Ghana can therefore draw on the experiences of developing Asian countries, in solving the transportation problem at the producing centres, through the acquisition of bicycle driven trailers and pushers-carts for rural transportation.

4. Strengthening of public and private institutions engaged in agricultural commodity transport. Public transport institutions, such as the State Transport Corporation (STC), the State Express Service, and the Omnibus Service

Authority (OSA) could be supported by government to acquire freight trucks for the transportation of agriculture commodities. The support could be in the form of import relief on the imported freight trucks and parts. Private transport institutions such as the Ghana Private Road Transport Union (GPRTU) could also be given credit by the banks to acquire and operate freight trucks. The credit could be delivered and supervised along similar channels, as exists for the acquisition and operation of passenger vehicles, by the GPRTU, with the assistance of ADB and the Ghana Co-operative Bank.

5. Government could also provide technical assistance to improve the skill of local artisans, in the manufacture of simple vehicle running spare parts, and farm transport facilities such as carts and trailers.

6. Government could also reduce commodity transporters' operating costs through a reduction in the number of security check points along the routes in the country.

(e) Storage Infrastructure Development

The lack of deliberate storage of commodities and losses resulting from spoilage and pilferage could however be attributed to the lack of adequate storage facilities in the market. For a reduction in marketing costs, there is the need for the following to be undertaken:

1. Provision of proper storage facilities in the market. The District Assemblies could make it a priority to rehabilitate and construct large-scale storage and warehousing facilities in market, for lease by private entrepreneurs, after proper

feasibility studies have been conducted.

2. Provision of financial support to market operators, to own and operate storage facilities in the Market. Financial assistance for the construction of small-scale storage facilities in market, could be granted through the Agricultural Sector Investment Project (ASIP), and the District Assemblies, who would be directly responsible for cost assessment, financing, supervision of construction works and recovery of credit.
3. Strengthening of institutions engaged in agricultural commodity storage. The GFDC could be encouraged to locate some of the silos in and around the major commodity assembly and wholesaling markets. Most traders do not store with the GFDC since the silos are generally located far from the markets.

(f) Development of Physical Market Infrastructure

The lack of proper market infrastructure greatly influences the way agricultural commodities are handled in the market and, as a result, marketing costs. Proper market sheds and stalls should be provided in the markets in order to reduce the incidence of commodity spoilage and quality deterioration resulting from exposure to the sun and rain.

Secondly platforms for loading and unloading of food crops, as well as, parking space for trucks, could be constructed in the markets to reduce congestion and commodity loss resulting from improper handling. Lack of such facilities result in high level of spillage and mutilation of agricultural commodities, since itinerant traders are compelled to load and unload goods in the often congested markets.

The markets could also be provided with good drainage system and health services in order, to ensure that commodities are handled under very hygienic conditions..

(g) Standardisation and Grading

The lack of standard weights and measures in the marketing system reduces the pricing and operational efficiency of the markets. Agricultural commodities are also of heterogeneous quality, and, therefore, need to be sorted and graded to allow for meaningful price quotation.

To benefit from the numerous advantages cited above, government could introduce for adoption, a legal and institutional framework for the standardisation, grading and packaging of commodities in the food marketing system. A standardisation and grading unit could be established under the Ghana Standards Boards (GSB). The unit, so established, could be made responsible for the education of market participants on the methods and advantages of standardisation, grading and packaging.

(h) Market Information

Market information gathering and dissemination plays an important role in improving the efficiency of performing the physical activities of agricultural marketing. Market information should therefore be collected and analysed for dissemination in a form which is clearly comprehensible to market participants, since market information gathered by the Statistical Services and the Ministry of Food and Agriculture are not readily accessible to market participants.

Information collected by the Ministry of Food and Agriculture are also disseminated, through radio broadcasting and print media, in the English language only. With the low level of education among market operators, widely spoken Ghanaian languages in various localities could be used for the dissemination of market information. In addition, bill boards and public address system could be provided in the markets to improve on dissemination of market information.

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APPENDIX 1

UNIVERSITY OF GHANA

DEPARTMENT OF AGRICULTURAL ECONOMY AND FARM MANAGEMENT

QUESTIONNAIRE FOR MAIZE/YAM WHOLESALERS

1. MARKET AND MARKET TRADER CHARACTERISTICS

1.1 Gender (Male = 1 /Female = 2) ……

1.2 Age …… (years)

1.3 Level of Education ……

Year spent in school ……

1.4 Name of this market……Town ……

1.5 Year(s) in business ……(years)

1.6 Name the principal product you handle ……

1.7 What other economic activities do you engage in? ……

2. EXCHANGE TRANSACTIONS

2.1 Where do you purchase your principal products? (Tick)

On the farm ……

On the roadside ……

At the market ……

Storage depot ……

2.2 Do you use agents? (y=1 / n=2) ……

How much do you pay? …… (per maxibag or 100 tubers)

2.3 Do you always purchase from the same person or people? (Y=I / N=2) ……

2.4 If yes (1), why ……

2.5 If Yes to 2.3, how many suppliers do you have? ……(Number)

2.6 Do you have any special purchasing arrangement with your suppliers? (Y=1 /N=2) …… Specify

……

2.7 When do you pay for your principal product? (Tick)

Before harvest ……

After harvest ……

At time of purchase ……

After Sale of product ……

2.8 How many times do your handle the principal products in a month?…… (Number of trips).

2.9 What quantity of the principal product do you usually handle on a trip? …… (Maxibag / tubers).

2.10 What is the purchase price of the product per unit? ¢…… (per maxibag or 100 tubers)

2.11 Where do you usually sell your principal product? Distance from market/place of purchase …… (km)

2.12 At what price do you sell the product in the market of sale? …… (per maxibag/100 tubers)

2.13 When do you receive payment for the products you sell

At time of selling ……

Days after sale of product ……

Before purchase of product ……

2.14 To whom do you usually sell your products? ……

2.15 Marketing costs

Source of cost	Amount paid
……	……
……	……
……	……

3. STORAGE

3.1 Do you store your produce (Y=1 / N=2) ……

3.2 If yes to 3.1., where do you store? (Tick)

On the farm ----------

At the market ----------

Other places (Specify) ……

3.3 What is the cost of storage? ¢ …….. (Per unit)

3.4 On average how much is stored? …… (Maxibags/tubers)

3.5 How long do you store your product? ……..(Days/Weeks/Months)

3.6 When do you store your products? ……

3.7 Do you record spoilage or quality deterioration during storage? (Y=1 / N=2) ……

3.8 How many parts out of ten of your principal product was not sold because of spoilage or quality deterioration, and losses in transit? ……

4. TRANSPORTATION

4.1 How do you usually transport your produce to your market of sale?

By foot (head load) ……..

By bicycle ……..

By animal ……..

By bus or car ……..

In small lots by lorries ……..

In bulk by lorry ……..

By tractor ……..

By train (rail transport) ……..

By ferry (lake transport) ……..

4.2 How much does it cost to transport the product? ……..(per maxibag/100 tubers)

4.3 How much do you pay for loading/unloading your product …… (per maxibag/100 tubers)

4.4 Place of purchase …… place of sale …… Distance …… Km

4.5 Do you hire your means of transport? (Y=1/N=2) ……

If YES, what are the terms……

5. PROCESSING

5.1 Do you process your major products (Y=1/N=2) ……

5.2 What quantity of the major product do you process on the average …… (maxibags/tubers) Per …… day; or …… week; or …… Month.

5.3 How much does it cost to process ¢…… (per maxibag/100 tubers)

Processing Activity	Cost
----------	----
----------	----

6. FINANCING

6.1 Do you belong to any market association or organisation? (y=1 / N=2) ……

If YES, what services does the association provide? (Tick)

Loans or credit …… Information on prices and supply……

Cooperative buying …… Transport ……

COoperative lending …… Other (specify) ……

6.2 What is your source of financing? (Tick)

Self …… Co-operative/Association ……

Bank…… Money lender ……

Other traders …… Other (Specify) ……

6.3 What rate of interest do you pay for borrowed money? …… (percent)

6.3.1 Source of borrowed money …… Amount borrowed ¢……

Amount to repay ¢……

6.3.2 How long do you have to repay borrowed money …… (Months)

6.4 Did you have to provide collateral (security) for the loan or credit? (Y=1 / N=2) ……

If YES, what type? ……

6.5 Have you ever sold any personal possessions or belongings to finance your business? (Y=1 /N=2) ……

6.6 If YES, to 6.5., specify item (s) sold ……

6.7 Do you save (Y=1 / N=2)……

6.8 If yes to 6.7., where?

At home …… Bank ……

Credit Union …… Susu ……

Others (specify) ……

6.9 How far is the nearest bank from your permanent place of activity? …… (km)

6.10 Have you ever applied to a bank for financing? (Y=1 /N=2) ……

6.11 If No to 6.10 why not? ……

6.12 If YES, to 6.10, was your request granted? (Y=1 N=2)……

6.13 Are you giving credit to others? (Y=1 / N=2)……

If YES, to whom ……

6.14 On what conditions do you give credit? ……

APPENDIX 2

UNIVERSITY OF GHANA

DEPARTMENT OF AGRICULTURAL ECONOMY AND FARM MANAGEMENT

II **QUESTIONNAIRE FOR MAIZE/YAM TRANSPORTERS**

I. **TRANSPORTER CHARACTERISTICS**

1.1 Age …… (years)

1.2 Gender (Male=1 / Female=2) ……

1.3 Level of Education …… Years spent in school ……

1.4 Name of Principal product you transport ……

1.5 Number of years in business ……(years)

1.6 Are you a member of any association? (Y=1 / N=2) ……

Specify ……

2. **COST STRUCTURE**

2.1 From where do you usually transport the principal product? …… and to where? …… Distance …… (km)

2.2 What quantity of fuel do you use for a return trip? …… gallons of petrol/diesel (Tick applicable one)

2.3 What other costs do you incur on a trip?

Source of Cost	Amount paid
……	……
……	……
……	……
……	……

2.4 How many return trips do you make in a month? ……

2.5 How Many mates or helpers do you have on your truck? ……

2.6 What is the loading capacity of your truck? ……(maxibags/tubers)

2.7 How much do you charge to transport the product?¢ ……(per maxibag/100 tubers)

2.8 How much did it cost to buy this vehicle? ¢……

2.9 How much do you pay for repairs and maintenance in a month ? ¢……per Month

3. FINANCING

3.1 If you belong to any association, what services does it provide? (Tick)

Loan or Credit ……

Transport charge determination ……

Co-operative Transportation ……

Information ……

Other (specify) ……

3.3 What rate of interest do you pay for borrowed ……..(percent). Amount borrowed ¢……

Amount to repay ¢ ……..

3.3.1 Source of borrowed money ……

3.3.2 How long do you have to repay borrowed money?……..(months)

3.4 Did you have to provide collateral (security) for the loan or credit? (Y=1/N=2). If YES, what type ……

3.5 Have you ever sold any peronal possessions or belongings to finance your business? (Y=1 / N=2)……

3.6 If YES to 3.5, specify items (s) sold ……

3.7 Do you save? (Y=1/N=2) ……

3.8 If YES to 3.7, where? (Tick)

At home …… Susu……

Credit Union …… Other (specify) ……

Bank ……

3.9 How far is the nearest bank from your permanent place of activity? ……(km)

3.10 Have you ever applied to a bank for financing? (y=1/N=2)……

3.11 If No to 3.10, why not? ……

3.12 If YES to 3.10, was your request granted? (Y=1 / N=2)……..

3.13 Do you receive credit from the traders whose products you transport? (Y=1 / N=2) ……..

3.14 When do you usually receive payment, for transportation of the products? ……. Before; or ……. after the traders have sold the products (Tick applicable).

3.15 Are you giving credit to others? (Y=1 /N=2) ……

If YES, to whom ……

3.16 On what conditions do you give credit? ……

APPENDIX 3

UNIVERSITY OF GHANA

DEPARTMENT OF AGRICULTURAL, ECONOMY AND FARM MANAGEMENT

III **QUESTIONNIRE FOR PRIVATE STORAGE OPERATORS**

I MARKET AND STORAGE OPERATOR CHARACTERISTICS

1.1 Gender (Male=1/Female=2) ……

1.2 Age …… (years)

1.3 Level of Education …… Years spent in school ……..

1.4 Name the principal product you store ……..

1.5 Number of years in business ……

1.6 What other product(s) do you store? ……

1.7 Name of this market ……

2. **OPERATING COSTS**

2.1 Do you own the structures in which you store the produts (Y=1/N=2) ……

2.2 If YES to 2.1., how much did it cost to build/erect? ¢ ……

2.3 How much do you pay for renting the land? …… per month.

2.4 If No to 2.1., do you rent the structure/store ? (Y=1/N=2) ……

If YES, how much do you pay per month ¢……

2.5 What kind of labour do you employ?

Kind of labour	Amount paid/day
……	……
……	……
……	……
……	……

2.6 Do you provide any of the following during storage? ……

Storage Activity Drying	(Yes=1 / No=2)	Cost (¢)
Fumigation	……	……
Drying	……	……

2.7 Do you have any other costs? (Y=1 /N=2) ……

Source of Cost	Amount paid
……	……
……	……
……	……

3. STORAGE TRANSACTIONS

3.1 Which people bring their products for storage?

Farmers …… Other storage operations ……

Traders …… Other (specify) ……

Transporters ……

3.2 On average how long do people leave their produce in storage? …… (days/weeks/months)

3.3 How much do you charge per day? …… (per maxi bag/100 tubers).

3.4 Do you record quality deterioration or spoilage during storage? (Y=1 / N=2) ……

4. FINANCING

4.1 Do you belong to any association (Y=1/N=2)……

4.2 If YES to 4.1, what services does the association provide? (Tick)

Loans or credit ……

Storage charge determination ……

Co-operative storage ……

Other (specify) ……

4.3 What is your source of financing? {Tick}

Self …… Bank ……

Family/friends ……. Association ……

Traders …… Money lenders ……

Other storage Agents …….. Other (specify) ……

4.4 What rate of interest do you pay for borrowed money? ……

4.4.1 Source of borrowed money …… Amount to repay ……

4.4.2 How long do you have to repay borrowed money? …… (months)

4.5 Did you have to provide collateral (security) for the loan or credit? (Y=1/N=2) …… If YES, what type? ……..

4.6 Have you ever sold any personal possession of belongings to finance your business? (Y=1 / N=2) ……

4.7 If YES, to 4.6, specify item(s) sold ……

4.8 Do you save? (Y=1 / N=2) ……

4.9 If YES to 4.8., where [Tick]

At home …… Susu ……

Credit Union …… Other (specify) ……

Bank……..

4.10 How far is the nearest bank from your permanent place of activity?…… (km)

4.11 Have you ever applied to a bank for financing? (Y=1 / N=2) ……

4.12 If No to 4.11., was your request granted? Y=1/N=2) ……

4.13 If YES to 4.11., was your request granted? (Y=1 /N=2) ……..

4.14 Do you receive credit form those whose products you store? (Y=1 /N=2)……

4.15 When do you usually receive payment, for products you store? …… before; or …… after the traders have sold the products.

4.16 Are you giving credit to others? (Y=1 / N=2)……

If YES, to whom ……

4.17 Under what conditions do you give credit? ……

APPENDIX 4

UNIVERSITY OF GHANA

DEPARTMENT OF AGRICULTURE ECONOMY AND FARM MANAGEMENT

IV QUESTIONNAIRE FOR MAIZE PROCESSORS

1. PROCESSOR CHARACTERISTICS

1.1 Gender (Male=1/Female=2) ……..

1.2 Age …… (years)

1.3 Level of Education …… Years spent in school ……

1.4 Name of the principal product you process for sale ……

1.5 Name of years in business ……

1.6 What other products do you process for sale? ……

1.7 Name of the market ……

1.8 Where do you process your principal product? …… Distance from this market …… (km)

2. PROCESSING COSTS

2.1 What quantity of the major product do you process at a time? …… (maxibags/tubers)

2.2 What quantity of the processed product do you usually obtain form the quantity stated in 2.1 above? …… (basket).

2.3 How much does it cost to process the quantity stated in 2.1 above?

Processing Activity	Cost (¢)
……	……
……	……

2.4 How do you transport the produce to the market for sale? [Tick]

By foot (head loading) …… in small lots by lorries ……

By bicycle …… In bulk by lorry ……

By animal …… By tractor ……

By bus or car …… By ferry ……..

3. EXCHANGE TRANSACTIONS

3.1 Where do you purchase the major product you possess?

On the farm ……

On the roadside ……

At the market ……

Other places (specify) ……

3.2 Do you always purchase form the same person or people? (Y=1/N=2) ……

3.3 If YES to 3.2., do you have any special purchasing arrangement with your suppliers? (Y=1 / N=2)

……Specify……

3.4 For the last purchases you made, what was the price of the major product processed?

¢…… (per maxibag/100 tubers).

3.5 When do you pay for the major product you process?

Before harvest ……..

After harvest ……..

At time of purchase ……..

After sale of processed form……..

3.6 For the last processed product you sold, how much was the price of one unit? ¢…… (per basket)

3.7 When do you usually receive payment for the processed products you sell?

Before the product is processed ……..

After the product is processed ……

At times of sale ……

After buyer sells the product ……

3.8 What marketing costs do you incur?

Source of cost	Amount paid/basket
……	……
……	……

4. STORAGE

4.1 Do you store your produce? (Y=1 / N=2) ……

4.2 If YES to 4.1., where do you store? (Y=1 / N=2) ……

At home ……..

On the market ……..

Other places (specify) ……..

4.3 How much do you pay for storage per day …….. (per basket)

4.4 On average, how many of the processed products is stored in a week …….. (basket).

4.5 Do you experience spoilage or quality deterioration duration storage? (Y=1 / N=2) …….. If YES, what quantity of the stored products do you lose in a week …….. (baskets).

5. TRANSPORTATION

5.1 How do you usually transport you processed product to the market?

By foot (head loading) ……. In small lots by lorries ……

In bulk by lorry …….. By bicycle ……..

By Tractor…….. By animals

By Ferry ……..

5.2 How much does it cost to transport the major product you process form the market of purchase to the place of processing? …….. (per maxibag/100 tuber).

5.3 How much does it cost to transport the processed product to the market for sale? …….. (per basket).

5.4 How much do you pay for loading/unloading the processed product?

…….. (per basket).

6. FINANCING

6.1 Do you belong to any association or co-operative? (Y=1 / N=2) ……

If YES, what services do these associations provide?

Loans on credit ……

Information on prices ……

Transport ……

6.2 Do you save? (Y=1 / N=2) …… If YES, where?

At home ……

Bank ……

Credit Union ……

Susu ……

Other (specify) ……

6.3 Have you ever applied for financing from a bank? (Y=1 / N=2) ……

6.4 If No to 6.5., why? ……..

6.5 If YES to 6.5., were you given the credit facility? (Y=1 / N=2) …… If your application was declined, what were some of the reasons given? ……

6.6 What are your source of financing?

Self ……

Relations ……

Bank (specify) ……

Co-operative / Association ……

Money lender ……

Susu ……

Other (specify) ……

6.7 If you obtain financing from the bank or money lender, how do you borrow at a time? ……. After how long do you have to repay the loan? …… month or …… Years.

6.8 What rate of interest do you pay? …… (percent).

If you do not know the rate give,

Amount borrowed ¢……..

Amount to repay ¢…… Period ……(months)

6.9 Did you have to provide collateral [or security] for the loan or credit? (Y=1 / N=2) ……. If YES, what type? ……

6.10 If you are a member of a susu/credit union, how much do you contribute per week? …… (amount).

6.11 Have you ever sold any personal possessions belongings to finance your business? (Y=1 / N=2) …… specify item(s) sold ……

6.12 Do you finance your regular suppliers? (Y=1 / N=2)……

APPENDIX 5

AVERAGE PROJECTED CASHFLOW ANALYSIS FOR MAIZE WHOLESALER (CEDIS)

PARTICULARS	MONTH 0	MONTH 1	MONTH 2
CASH INFLOW			
Sales	0	3445000	3445000
Total Cash Inflow	0	3445000	3445000
CASH OUTFLOW			
Purchase of Goods	432000	1728000	1728000
Transport Costs	192000	768000	768000
Storage Costs	6000	24000	24000
Sundry Expenses	74000	296000	296000
Contingency -5 %	35000	141000	141000
Total Cash Outflow	739000	2957000	2957000
NET GAIN/(LOSS)	(739000)	488000	488000
CASH SUMMARY			
Cash at beginning	0	11000	132000
Add Net Gain/(Loss)	(739000)	488000	488000
Tentative Cash Balance	(739000)	499000	620000
Add Loan/ Deduct Rept.	750000	367000	409000
Closing Cash Balance	11000	132000	211000
DEBT SITUATION			
Opening Loan balance	0	750000	400000
Interest Charged - 27%p.a.	0	17000	9000
Cummulative Interest	0	7000	9000
Loan Repayment(Prin/Int)	0	367000	409000
Loan Disbursement	750000	0	0
Closing Loan Balance	750000	400000	0

Internal Rate of Return - 20.73% per month

APPENDIX 6

AVERAGE PROJECTED CASHFLOW ANALYSIS FOOR YAM WHOLESALER (CEDIS)

PARTICULARS	MONTH 0	MONTH 1	MONTH 2
CASH INFLOW			
Sales	0	2811000	2811000
Total Cash Inflow	0	2811000	2811000
CASH OUTFLOW			
Purchase of Goods	540000	1620000	1620000
Transport Costs	168000	504000	504000
Storage Costs	12000	36000	36000
Sundry Expenses	22000	66000	66000
Contingency -5 %	37000	111000	111000
Total Cash Outflow	779000	2337000	2337000
NET GAIN/(LOSS)	(779000)	474000	474000
CASH SUMMARY			
Cash at beginning	0	21000	77000
Add Net Gain/(Loss)	(779000)	474000	474000
Tentative Cash Balance	(779000)	495000	551000
Add Loan/ Deduct Rept.	800000	418000	409000
Closing Cash Balance	21000	77000	142000
DEBT SITUATION			
Opening Loan balance	0	800000	400000
Interest Charged - 27%p.a.	0	18000	9000
Cummulative Interest	0	18000	9000
Loan Repayment(Prin/Int)	0	418000	409000
Loan Disbursement	800000	0	0
Closing Loan Balance	800000	400000	0

Internal Rate of Return - 14% per month

APPENDIX 7

AVERAGE PROJECTED CASHFLOW ANALYSIS FOR MAIZE PROCESSOR (CEDIS)

PARTICULARS	MONTH 0	MONTH 1	MONTH 2	MONTH 3
CASH INFLOW				
Sales	0	108000	108000	108000
Total Cash Inflow	0	108000	108000	108000
CASH OUTFLOW				
Purchase of Goods	11000	42000	42000	42000
Transport Costs	6000	22000	22000	22000
Storage Costs	5000	19000	19000	19000
Sundry Expenses	2000	9000	9000	9000
Contingency -5 %	1000	5000	5000	5000
Total Cash Outflow	25000	97000	97000	97000
NET GAIN/(LOSS)	(25000)	11000	11000	11000
CASH SUMMARY				
Cash at beginning	0	5000	5300	5850
Add Net Gain/(Loss)	(25000)	11000	11000	11000
Tentative Cash Balance	(25000)	16000	16300	16850
Add Loan/ Deduct Rept.	30000	10700	10450	10230
Closing Cash Balance	5000	5300	5850	6620
DEBT SITUATION				
Opening Loan balance	0	30000	20000	10000
Interest Charged - 27%p.a.	0	700	450	230
Cummulative Interest	0	700	450	230
Loan Repayment(Prin/Int)	0	10700	10450	10230
Loan Disbursement	30000	0	0	0
Closing Loan Balance	30000	20000	10000	0

Internal Rate of Return - 16% per month

APPENDIX 8

AVERAGE PROJECTED CASHFLOW ANALYSIS FOR PRIVATE STORAGE OPERATION (¢`000)

PARTICULARS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CASH INFLOW															
Storage Charge	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
Total Cash Inflow	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
CASH OUTFLOW															
Storage Structure	883	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Operating Expenses	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39
Contingency - 5%	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Total Cash Outflow	924	41	41	41	41	41	41	41	41	41	41	41	41	41	41
Net Gain/ Loss (Before Financing)	(804)	79	79	79	79	79	79	79	79	79	79	79	79	79	79
CASH SUMMARY															
Beginning Cash	0	96	79	87	96	106	117	130	124	120	117	116	117	120	124
Add Net Gain/Loss	(804)	79	79	79	79	79	79	79	79	79	79	79	79	79	79
Tentative Cash Balance	(804)	175	158	166	175	185	196	209	203	199	196	195	196	199	203
Add Loan/Deduct Rept.	900	(96)	(71)	(70)	(69)	(68)	(66)	(85)	(83)	(82)	(80)	(78)	(76)	(75)	(113)
Net Gain (After Financing)	96	79	87	96	106	117	130	124	120	117	116	117	120	124	90
DEBIT SITUATION															
Opening Loan Balance	900	923	850	800	750	700	650	600	530	460	390	320	250	180	110
Interest Charged - 30 %	23	23	21	20	19	18	16	15	13	12	10	8	6	5	3
Cummulative Interest	23	46	21	20	19	18	16	15	13	12	10	8	6	5	3
Loan Repayment(Pria/Int)	0	96	71	70	69	68	66	85	83	82	80	78	76	75	113
Closing Loan Balance	923	850	800	750	700	650	600	530	460	390	320	250	180	110	0

APPENDIX 9

AVERAGE PROJECTED CASHFLOW ANALYSIS FOR PRIVATE YAM TRANSPORT OPERATION (¢' 000)

PARTICULARS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
CASH INFLOW																			
Transport Charge	0	1044	1044	1044	1044	1044	1044	1044	1044	1044	1044	1044	1044	1044	1044	1044	1044	1044	1044
Total Cash Inflow	0	1044	1044	1044	1044	1044	1044	1044	1044	1044	1044	1044	1044	1044	1044	1044	1044	1044	1044
CASH OUTFLOW																			
Purchase of Vehicle	8500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Operating Expenses	-	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402
Contingency - 5%		20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Total Cash Outflow	8500	422	422	422	422	422	422	422	422	422	422	422	422	422	422	422	422	422	422
Net Gain/ Loss (Before Financing)	(8500)	622	622	622	622	622	622	622	622	622	622	622	622	622	622	622	622	622	622
CASH SUMMARY																			
Beginning Cash	0	0	622	413	432	361	303	257	224	203	245	298	312	339	378	330	297	276	270
Add Net Gain/Loss	(8500)	622	622	622	622	622	622	622	622	622	622	622	622	622	622	622	622	622	622
Tentative Cash Balance	(8500)	622	1244	1035	1054	983	925	879	846	825	867	920	934	961	1000	952	919	898	892
Add Loan/Deduct Rept.	0	0	(831)	(603)	(693)	(680)	(668)	(655)	(643)	(580)	(569)	(608)	(595)	(583)	(670)	(655)	(643)	(628)	(257)
Net Gain (After Financing)	(8500)	622	413	432	361	303	257	224	203	245	298	312	339	378	330	297	276	270	635
DEBIT SITUATION																			
Opening Loan Balance	8500	8500	8710	8100	7700	7200	6500	6000	5500	5000	4600	4150	3650	3150	2650	2050	1450	850	250
Interest Charged	0	210	221	203	193	180	168	155	143	130	119	108	95	83	70	55	43	28	7
Cummulative Interest	0	210	431	203	193	180	168	155	143	130	119	108	95	83	70	55	43	28	7
Loan Repayment(Prin/Int)	0	210	831	603	693	680	668	655	643	530	569	608	595	583	670	655	643	628	257
Closing Loan Balance	8500	8710	8100	7700	7200	6500	6000	5500	5000	4600	4150	3650	3150	2650	2050	1450	850	250	0

APPENDIX 10

Projected Benefit-Cost Analysis of Transportation, Storage and Processing of Maize and Yam

The costs incurred by market operators performing the physical functions of agricultural marketing in Ghana (chapter 4), are used in a cash flow analysis of how market operators finance their operations.

The cash flow analysis of the maize wholesaler (Appendix I) indicates that a total funds of about ¢750,000 was required for normal business. The maize wholesaler required about two months to repay the loan, at an interest rate of 27 percent per annum. The sales revenue of ¢3,455,000 for a month was obtained from an average of 60 bags per trip. The wholesalers made an average of 4 trips in a month. The average wholesale price of a maxi bag of maize In Accra was ¢14,500. The average losses in transit observed in the survey was estimated at about 1 percent. A 1 percent deduction on the estimated revenue was in order to take care of losses of maize in transit. Cash outflow in the first month represents working capital requirement per trip, which is financed with a loan of ¢750,000. The rate of return on investment as 20.73 percent for the itinerant maize wholesaler. Oteng (1974) obtained monthly return on investment of between 3.1 and 19 percent for maize wholesalers.

The cash flow analysis of an itinerant yam wholesaler over a period of three months shows that the yam wholesaler required working capital of about ¢800,000 (Appendix 2). The cash sales for month 1 is estimated at about ¢2.811 million. The average volume of yam handled on each of the estimated 3 trips is 1,200 tubers and is sold in Accra for

The analysis in Appendix 2 indicates that the borrowed principal of ¢800,000, at an interest rate of 27 percent per annum, can be repaid in addition to the interest thereon, within two months. The monthly rate of return on investment for the yam wholesaler was estimated as 14 percent.

The very low monthly return on investment for the itinerant yam wholesaler could be attributed to high yam transport costs per tonne-km and the number of trips of the yam wholesaler per month. The itinerant maize wholesaler also enjoys a higher turnover on borrowed capital by making return trips in a month whilst the itinerant yam wholesaler makes only 3 return trips,

The cash flow analysis of maize processors (Appendix 3), is projected over a period of 4 months. There are no cash receipts for month 0 since most of the trader's do not receive payments for their sales until between 3 to 4 weeks. The total cash flow expected in each of the subsequent month is ¢108,000. The total cash inflow was obtained by multiplying the average number of baskets of corn dough sold on the Mallam Atta market, by the itenerant corn dough seller, by 4 weeks. A credit of ¢30,000 could be repaid in 3 months from monthly cash gain of ¢11,000. The rate of return on investment was estimated as 16 percent per month.

The monthly rate of return of the activities of maize and yam operators ranged between 14 and 20.73 percent per month, which are far lower than interest rates on credit available to market operators (Appendix 1 to 3).

The cash flow of private transport and storage operators in maize and yam trade are constructed to help analyse how maize and yam traders can finance the integration of their

marketing activities (Appendices 4 and 5)

The yam transportation cash flow analysis (Appendix 4) estimated using the operating expenses of yam transporters is used to explain how itinerant yam (and maize) wholesalers can integrate their marketing activities by acquiring trucks in groups of two or three, and how the capital outlay involved is financed.

Appendix 4 is projected over a period of nineteen months, assuming constant level of operation for the entire period. The total credit requirement is ¢8,922,000 which comprises of ¢8.8 million initial capital outlay for purchasing a 7 tonne mummy truck, and ¢422,000 required for financing the operating expenses and other contingent liabilities incurred in the first month of operation. The total monthly cash inflow of ¢1.044 million is calculated by multiplying the total number of tubers transported on each trip, 2,400 tubers, by the 3 trips in a month and the average transport charge on 100 tubers of yam transported from Techiman to Accra. The loan of ¢8.5 million granted in the first month is repaid, together with 30 percent interest per annum thereon, in 18 months.

The cash flow analysis for private maize storage constructed using the operating expenses of a private storage agent is also employed to analyse the financing of maize storage operation by a maize trader (Appendix 5). The analysis shows that a loan of ¢0.9 million for the construction and operation of a 5m x 9m storage facility with the capacity to store 60 maxi bags of maize require a period of 15 months to be repaid, at an interest rate of 30 percent per annum.