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thesis entitled

A SOCIOECONOMIC ANALYSIS OF FARMERS' FOOD GRAIN MARKETING LINKAGES AND BEHAVIOR IN EASTERN UPPER VOLTA

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has been accepted towards fulfillment
of the requirements for

Ph.D. degree in Agricultural Economics

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Date Dec 29/1983

A SOCIOECONOMIC ANALYSIS OF FARMERS' FOOD GRAIN MARKETING LINKAGES AND BEHAVIOR IN EASTERN UPPER VOLTA

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A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Agricultural Economics

1983

ABSTRACT

A SOCIOECONOMIC ANALYSIS OF FARMERS' FOOD GRAIN MARKETING LINKAGES AND BEHAVIOR IN EASTERN UPPER VOLTA

By

Ismael S. Ouedraogo

The purpose of the study was to analyze food grain (sorghum and millet) marketing processes, and producers' food grain marketing behavior and problems in Eastern Upper Volta. The study was part of a large microeconomic research effort aimed at evaluating animal traction packages and providing baseline data for future comparative studies and evaluation.

The analysis follows a descriptive-diagnosis-prescriptive framework. The analytical measures include descriptive analysis, food grain and cash flow statements, timing of transactions, and inferential statistical tests. Primary data were collected in a region-wide farm survey of 480 farmers, from May 1978 to April 1979, and a region-wide marketing survey, from July 1979 to June 1980.

The analysis finds that the E-ORD grain marketing system is comprised of house trading, marketplace-oriented trading, and farm gate-oriented assembly processes particularly adapted to the local conditions. Both public and private networks mainly operate to export grain outside the region, and neglect the back-flow of grain. Household grain flows involve small exchange volumes.

In 1978-79, there were more grain purchases than sales, most stocks were decreased, and there was hardly any marketed or marketable surplus in the villages studied. Farm gate prices received and paid were low at harvest and high at the hungry season. But average sales were larger before and after harvest than during harvesttime. Food and other cash expenses were financed more by other enterprises than crop sales.

Another major finding is that advanced sales are not that important in terms of volumes and number of producers involved. The information relating to farmers' perception of market fairness and measurement on the farm is mixed. The data reveals farmers' strong needs for better measurement devices. Another finding is that Village Cereal Banks face serious problems necessitating a rethinking of the scheme's objectives and management.

To improve the E-ORD's grain marketing performance, the study recommends policy actions aimed at providing better marketing services to producers, and fostering better cooperation between public and private institutions. Future research needs in the E-ORD are also suggested in areas of participants' storage behavior, marketing costs, and key marketing statistics.

To

My late mother, Bintou Kaboré

and to

my wife, Betty, and my daughters,
Nina and Laissa

in appreciation for their love

ACKNOWLEDGMENTS

My deepest gratitude goes to Carl Eicher who provided advice and assistance throughout my graduate program. Special appreciation is extended to Michael Weber, my major professor and thesis supervisor, whose guidance and friendship were instrumental in the completion of this dissertation. Thanks are also given to members of my guidance committee, James Shaffer, Eric Crawford, and Peter Schmidt, and to Harold Riley and Assefa Mehretu for their insightful comments. All errors and omissions are my own.

Many other individuals also contributed to this study. I thank my long-time friend, Edward Tapsoba, for his encouragements, and David Wilcock for his leadership in the field research. I am indebted to them and the other members of the MSU-Fada team, Greg Lassiter, Vince Barrett, and Thomas Stickley, for the collection and preparation of much of the data used in this study. Special acknowledgment is given to Jean Dahny who contributed invaluable services as a knowledgeable informant. Chris Wolf and Paul Wolberg provided assistance in the computer work, and James Bingen's help is appreciated for arranging with USAID part of the financing for my Ph.D. program.

Special acknowledgment is also given to Cindy Spiegel, who typed earlier drafts of the manuscript, and Nancy Creed with assistance of Debbie Greer, who typed the final copy, for their tenacious work under considerable time pressure.

I also want to thank my loving wife, Betty. Her confidence and support cannot be overstated.

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CHAPTER 1

INTRODUCTION

1.1 Background

Going into the 1980s and the third decade of their independence, most sub-Saharan countries still face the biggest challenge of economic development: How to provide to all segments of their growing populations with abundant, reliable, and nutritious food supplies. On the whole, it appears that the challenge is not being met. A recent USDA report (1981, p. 1) shows that "sub-Saharan Africa is the only region of the world where per capita food production declined over the past two decades."

Clearly, numerous factors account for the precarious food situation in sub-Saharan Africa. Strong population growth certainly plays an important part. Natural disasters, undoubtedly, have also taken their heavy toll. (Caldwell, 1975, estimated that the drought that plagued Sahelian countries in 1968-1974 reduced total food production by a third or more and was directly responsible for the deaths of up to 100,000 people.) Even barring prolonged droughts, the unreliability of annual rainfall plays havoc with dry land farming systems. There is also a lack of readily available improved production technology, effective extension services, and functional rural infrastructure.

However, the food problem is not solely caused by low per capita food production; it is also caused by inadequate food distribution systems. In fact, it is the whole food production-distribution-consumption

system that is not performing well. That is, even when production is abundant, food may not flow adequately within the rural area and from the producing areas to urban consumers. Many food production projects have been thwarted by the neglect of the input and product distribution system.

The neglect of the agricultural marketing system by policy makers is rooted in misconceptions and misunderstandings. First, economic planners sometimes believe that the marketing system is self-evolving and that only farmers need assistance. Second, decision makers often think that private traders are exploitative or parasitic, and are thus led to the belief that government agencies could replace private merchants and provide all necessary marketing services at lower costs. Third, the knowledge of the behavior of so-called subsistence farmers with respect to marketing is very shallow. For example, development projects sometimes assume simplistically either that producers are currently satisfying all their consumption needs so that all increased surplus production generated would be available to urban consumers, or that the food disposed of is a fixed proportion of total output.

The farming system in developing countries is neither a subsistence (autarchic) nor a commercial agriculture, but rather one in transition (R. Krishna, 1969; Wharton, 1969) in which food is not only produced for consumption, but also for sale. Food is also disposed of and acquired through many exchange systems. Thus, there is a need for a better understanding of the food availability at the farm level and the functioning of the rural food distribution system. Such understanding is the key to improving the food production and marketing situation in sub-Saharan Africa where the bulk of the population still lives in rural areas.

Unfortunately, there is often little available research on marketing. Hence, when reform is contemplated, policy makers introduce it in ignorance of the existence situation. Jones (1972, pp. 2-3) emphasizes that they should be "provided with the soundest possible information about the present operation of the system so that they may identify where government intervention might improve the system's operation and where it might be harmful."

1.2 Problem Statement

In Upper Volta, a land-locked sub-Saharan country with a population of 6 million and the size of 274 square kilometers, the Regional Development Organizations (ORD for Organisme Regional de Developpement), whose mandate is to promote agricultural development at the regional level, have had very little relevant marketing information to rely upon. The knowledge about food marketing in Upper Volta is sparse and is mostly provided by anthropologists and sociologists (Meillassoux, 1969; Kohler, 1971), and by short-term consultants whose reports may suffer from lack of in-depth analysis due, in part, to an unreliable data base (Morel, 1973; Bollinger, 1974).

Among all 11 ORDs in Upper Volta, the Eastern ORD (E-ORD) is perhaps the one for which this lack of information is the most dramatic. Yet, the Eastern Region is considered an important exporter of the staple food crop (sorghum and millet) and is thought to have even greater production potential. In 1974, an MSU consultancy mission found that the E-ORD lacked the most basic agricultural statistics, demographic data, and economic information (Eicher, et al., 1976). The mission recommended an Integrated Rural Development (IRD) project aimed at strengthening the

infrastructure of the regional agricultural extension organization, developing its institutional capability, and implementing an experimental extension program. Within this IRD project financed by USAID, MSU was selected to carry a microeconomic research at the village level.

From 1977 to 1981, the main thrust of MSU's effort in the E-ORD was to design and carry a large-scale farm survey[1] designed to provide socio-economic data to help evaluate the farm level impact of the current technical package (animal traction), provide basic information for regional planning and project design, and serve as a baseline for future comparative studies and evaluation.[2] As part of this farm survey, micro-level market research was to provide a basic understanding of the components of the rural food grain marketing system with particular emphasis on two questions, "...a systematic understanding of farmer production and marketing decisions; ...and (an assessment of) the degree of integration, competitiveness, and efficiency in various marketing systems" (Eicher, et al., 1976, p. 38). The author helped carry out part of this market research from 1979 to 1980.

At the start of the MSU farm survey in 1978, the E-ORD was confused about its actual and future role in grain marketing in the region. Because of financial difficulties, it had stopped buying producers' grain to sell to the cereal marketing board (OFNACER[3]) as the arrangement

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[1] See Chapter 4 for details on the farm survey design.

[2] See Lassiter, et al., 1982.

[3] OFNACER is the French acronym for Office National des Cereales.

between the two institutions called for. However, it was still managing the Village Cereal Bank, a project providing food grain consumption credit to farmers grouped in a precooperative association called village group (Groupement Villageois).

As the foregoing comments illustrate, there is a need for research on the staple food grain marketing in the E-ORD. In the state of confusion described, the questions to be asked are basic ones. Elliot Berg's following comments provide a good summary of the issues faced by the E-ORD:

> "What we need is to know more about the structure and functioning of grain markets. More specifically, we need a set of in-depth, village-level studies of crop disposal. This would involve closely linking marketing with production and labor use studies and would basically start at the harvest. The questions to be asked are: Who buys and who sells, when, where, to whom, and at what price? The link to the first market--whether house trade, local periodic market, or other--should be explored in depth. There is also need for more standard types of marketing studies, following the flows of grain through the distribution channels from producers or local markets to major consuming centers. The important point is that the basic structure of these markets is so poorly known that studies of this general type would seem to have first priority.[4]

1.3 Objectives of the Study

The overall objective of the study is to provide a better understanding of the processes of the rural food grain marketing system, particularly farmers' market linkages and decisions with respect to food grain marketing in E-ORD. The study is aimed at complementing the other studies[5] generated by the applied microeconomic research effort conducted

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[4] Elliot Berg, "Discussant's Comments," p. 291, to B. Harriss' article (1979a).

[5] A few of these studies are Ph.D. dissertations: Tapsoba, 1981; Lassiter, 1982; P. Fotzo, 1983; Kifle Negash, 1983 (forthcoming); F. Sands, 1984 (forthcoming).

by MSU in the context of the E-ORD Integrated Rural Development Project. The study has the following specific research objectives:

(1) To review the major food grain marketing issues in Upper Volta over the two decades following the country's independence (in 1960).

(2) To describe and analyze the food grain market channels and processes in terms of the organization and standard operational procedures of major market participants.

(3) To analyze producers' grain marketing behavior at the village level.

(4) To provide a diagnostic analysis of farmers' market linkages and problems.

(5) To suggest policy recommendations and an outline of research needs for analyzing over the longer-run food grain marketing problems in the E-ORD and Upper Volta.

1.4 Organization of the Study

The balance of the study is organized into seven chapters.

Chapter 2 reviews the literature on alternative approaches to the study of food marketing in the context of economic development. It identifies the role of marketing in development, develops a typology of major research approaches, and outlines the conceptual research framework used by the study. In the descriptive-diagnosis framework used, the study considers three levels: The national level (Chapter 3), the regional market channel level (Chapter 5), and the producer level (Chapters 6 and 7).

Chapter 3 provides a historical perspective of the major food marketing issues in Upper Volta in terms of the trend in food availability; this includes a discussion of the evolution of the debate on food grain marketing and particularly of the pattern of government interventions in grain marketing.

Chapter 4 reviews the research design and instruments. In particular, the main physical and institutional characteristics of the study site are described, along with the characteristics of the various empirical data sources which support the study.

Chapter 5 is a descriptive diagnostic analysis of the Eastern Region food grain marketing channels and processes. It describes the characteristics of the marketplaces, the major market participants, and the private and public market channels. It examines also the standard operational procedures of private and public marketing networks and estimates marketing costs in selected private channels.

Chapter 6 analyzes producers' marketing behavior at the village level. It uses the food grain flow statement and marketed-marketable surplus measures to examine the behavior of farmers who are grouped in a sample that is stratified according to ecological zones, farming techniques, and farm income. Chapter 6 also examines the patterns and timing of grain sales and purchases, farmers' cash flow situations, and the variability of farm gate prices paid and received.

Chapter 7 analyzes grain producers' market linkages and problems. It examines farmers' perceptions of marketing problems and the role of public agencies. It also presents empirical evidence on the issues of grain measurement and marketing credit. Finally, it evaluates the

Village Cereal Bank program which provides credit to farmers' groups to buy, store, and sell grain.

Chapter 8 reviews and summarizes the major findings of the study. Policy recommendations are formulated and future research needs are suggested.

CHAPTER 2

APPROACHES IN THE STUDY OF AGRICULTURAL MARKETING IN DEVELOPING COUNTRIES

2.1 Introduction

This chapter reviews the literature on agricultural marketing in developing countries in general, and in West Africa, in particular. It focuses on the role of agricultural marketing in the development process and the types of approaches used to study that role. It also serves as a backdrop to the review of the food marketing issues in Upper Volta presented in the next chapter.

2.2 Agricultural Marketing in the Development Process

The agricultural sector has long been recognized as a key to economic development. Within this sector, however, the role of agricultural marketing has been often times neglected to the benefit of production. Part of this neglect may be traced to scholars and economists' long-held belief that only production, or physical transformation, matters and that agricultural marketing passively adapts to economic development stages (K.D. Harrison, et al., 1974).

Starting in the early 1950s, however, economic scholars and planners have reassessed these traditional beliefs and recognized the dynamic role of agricultural marketing in the process of agricultural and economic development. R. Holton (1953) held that if marketing channels were less tortuous, more goods would flow through them and reach

more consumers. J.C. Abbott (1967) stressed the vital importance of integrating the expansion of marketing functions with the expansion of production. N.R. Collins and R.H. Holton (1964) emphasized that distribution can play a vital role in economic development by changing demand and cost functions in ways favorable to development. C.C. Slater, H. Riley, et al. (1969) conceptualized a market development strategy within the context of a comprehensive approach to development planning.

A key to the understanding of the dynamic role of marketing in development is the view that agricultural marketing should not be limited only to the activities that occur after the products pass through the "farm gate." Rather, it should be viewed as a "primary mechanism for coordinating production, distribution, and consumption activities" or as a "part of the set of activities coordinating various stages in a production-distribution channel such as the food system or a commodity subsystem." Agricultural marketing includes "the exchange activities associated with the transfer of property rights to commodities, the physical handling of products, and the institutional arrangements for facilitating these activities." (K.D. Harrison, et al., 1974).

Even though there is no single and unique path to economic growth and development, agricultural marketing plays a central role in all economic systems. In the development process, agricultural producers rely more and more on the environment outside the farm-family unit to provide food, consumer goods, and farm inputs. In addition, the growth of the urban and other nonfarm rural populations requires more marketing services to coordinate production and consumption activities. Hence, the lack of market access or the high cost of marketing services can cancel out efficiency in production, for producers will not get

acceptable cash returns which provide incentives to produce. The back flow of food, goods, and services to producers may serve also as an incentive to produce more.

2.3 Typology of Approaches in the Study of Marketing Issues

Marketing processes extend beyond traditional economic concerns and are embedded in the larger social system.[1] Hence, the social makeup and structural relationships are an important element in marketing studies. Marketing activities are also spread over large geographical areas and have spatial features. In sum, agricultural marketing research cuts across many disciplinary boundaries (geography, sociology, anthropology, economics, etc.) and addresses the problems of many different participants or decision makers (G. Johnson, to be published).

The approaches to the study of marketing issues in developing countries are varied, but they may be classified in three broad categories: feasibility studies, descriptive studies, and diagnostic assessments (H. Riley and M. Weber, 1979).

2.3.1 Feasibility Studies

Feasibility studies concern the evaluation of the economic and/or financial viability of physical infrastructure such as wholesale market centers, food storage facilities, and road construction. Too often, these studies are undertaken in a short time without adequate checks on the validity of the data used. They use optimistic assumptions about

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[1] According to Schmid and Shaffer (1964, p. 13), "The social system is the aggregate of institutions defining the relationships of any group of individuals. The economic system is that particular subset of institutions defining the limits of activity and dependence among individuals in the provision and use of goods and services within a society.

the technical and managerial resources in the host countries and the result has been an inappropriate utilization of the facilities.

2.3.2 Descriptive Studies

Studies by geographers, sociologists, and anthropologists provide valuable descriptive information on market systems, but they seldom carry policy recommendations for market development strategies. Carol A. Smith (1976, Vol. II, p. 6) suggests that "there have been practically no attempts (by anthropologists) to correlate spatial configurations with the formal properties of other aspects of social life." She adds that "geographers...tend to deal with the human component as given," and that "regional science still has far to go to make its models relevant to those who are concerned with real-world rather than normative or ideal systems."

On the whole, geographers and regional scientists have encountered many difficulties in the modelling of marketplaces and periodicity in West Africa on the basis of central place theory (see C.A. Smith, 1976; R.T. Smith, 1978; and C. Meillassoux, 1969). This is because in developing countries, the marketplace has social, political, and religious roles in addition to its exchange function. Furthermore, marketing activities may actually take place outside of physical market facilities[2] and market days, in what has been called "house" or "hidden trade" (P. Hill, 1969; C. Meillassoux, 1969), which weakens the importance of marketplaces in central place theory.

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[2]Polly Hill's definition of a marketplace is "an authorized concourse of buyers and sellers of commodities, meeting at a place more or less limited or defined, at an appointed time" (R.H.-T. Smith, 1978, p. 12).

Sociologists and anthropologists have found that many West African markets may have originated from the long-distance trade (in food grain, cola nuts, salt, animals, etc.) that linked in years past Saharan to Coastal states along the Benin Gulf. These researchers stress that because of this long-distance trade in West Africa, millet and sorghum have been traditionally grown not only for home consumption, but also for sale (C. Arditi, 1975; C. Raynaut, 1973). Raynaut (1973, p. 214), for example, contends that for centuries, in the Sahel, millet and sorghum have been the main commercial crops in the trade between herders and farmers, and that the flow of grain from rural to urban centers is a relatively new phenomenon. He adds that this commercial nature of millet and sorghum has been recently transformed into "forced" or "distress sales" to meet cash needs introduced by the new direction of trade, the increased monetization of the subsistence economy, and the power of trader, which leads to the unsettling of social structures.

2.3.3 Economic Diagnostic Assessments

Diagnostic assessments aim at providing inputs to policy and program development. A French researcher (C. Arditi, 1975, p. 13) admits that, in the past, economic research on the rural food marketing were carried out more by English-trained researchers than by French-trained ones. It would appear that, in the past, the French have not carried many economic analyses of rural food marketing because some believed that the products exchanged were not "traded goods;" that is, they don't have any exchange value. This has led them to believe that there was no "commercial" relations in the traditional food marketing (see Morel, 1973). However, this contradicts others' findings about the secular commercial nature of grain in West Africa.

Most rural food marketing studies conducted in West Africa have been in English-speaking countries (Nigeria, Sierra Leone, Ghana) and, only recently, in Francophone Africa by English-trained economists: Clark Ross (1979) in Senegal, J. Sherman (1981), and the present study in Upper Volta, etc. (see also the reviews by P. Riley and M. Weber, 1979; B. Harriss, 1978; and J. Sherman and I. Ouedraogo, 1981).

The studies by E. Gilbert (1969), W.O. Jones (1972), H.M. Hays (1975), and N. Ejiga (1977) follow the same pattern in the use of a structuralist interpretation of the structure-conduct-performance (S-C-P) approach[3] applied to price analysis to determine market competition and evaluate market efficiency. On the basis of paired market price correlation coefficients, seasonal and spatial price differentials, and profit margins they conclude that the traditional food marketing system is performing fairly well and that government active intervention is counterproductive. E. Berg[4] (1980), in studying marketing policies in the Sahelian States, reaches the same conclusions. The recommendations that flow from these studies ask governments to provide only

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[3]Presented by Joe S. Bain (1968) in his "Industrial Organization," the S-C-P model postulates a predictable relationship between the structure (organizational characteristics) of the industry, the conduct (behavior) of firms within that industry, and the performance of the industry. According to B. Marion (1976, pp. 4-5), most agricultural marketing economists using this approach have followed in the past three schools of thought. The first school of thought, "technological determinism," concentrates on the design of systems from a "logistics-production economics" point of view. The second, "behavioral," focuses on how the system functions, with strong emphasis on conduct affecting inter-firm vertical relationships. Finally, the third, "institutional," tends to concentrate on structure-performance relationships. It is the last school of thought and the perfect competition norm which provide the methodological underpinnings to past S-C-P studies of food marketing conducted in West Africa.

[4]See also CILSS (1977).

facilitative services (infrastructure, economic incentives, and market information) and leave the market to itself.

B. Harriss (1979a, b), a former user of S-C-P herself, "goes against the grain" of these conclusions. She asserts that the "fetishism of competition" and the "laissez faire" ideology of these researchers have weakened the value of their studies. She contends that price correlation is a faulty measure of market integration or competition owing to the facts, among others, that "high coefficients indicate stable margins or stable prices and by themselves could easily indicate monopoly conditions as perfect competition" (1979b, p. 202), and that "markets may well be integrated and yet have low correlations because market towns are centers of supply, nonfinal demand, and final demand" (1979b, p. 203). She also condemns the use of secondary data on market prices and the simplistic assumptions about price behavior over space and time, and she shows that in many studies there is no logical link between the empirical results and the conclusions drawn.

Riley and Weber (1979) have also criticized the same type of S-C-P approach used in previous marketing studies, but on different grounds. They note (in p. 12) that the aggregation bias with respect to participants' behavior and the data problem--stressed by Harriss--often make the results of such studies inappropriate for policy recommendations to provide services to specific target groups such as smallholders. They add that these studies overlook the dynamic process of coordinating production, processing, distribution, which takes place even in subsistence economies. In particular, they stress that the fundamental weakness of such S-C-P studies is their overemphasis on structural variables--and,

hence, the exclusion of conduct variables--as determinants of market performance.

Another approach to the study of marketing in development is that of marketed and marketable surplus of food grain. The analysis is usually cast in terms of the response to socioeconomic factors of households' food crop production and disposals. Most studies of marketed and/or marketable surplus have been carried out in the Indian subcontinent or the Far East (see, for example, R. Krishna, 1962; J.R. Behrman, 1966 and 1968; Z. Toquero, et al., 1975; K. Bardhan, 1970; and W. Haessel, 1975), and only a few in Africa (see A.I. Medani, 1975; and Ross Clark, 1979; N. Ejiga, 1977; P. Matlon, 1977; V.E. Smith, et al., 1981; and G. Lassiter, 1982, also mention the issue).

Many studies on marketed/marketable surplus provide empirical evidence of positive marketed/marketable surplus response to prices. Still, a few studies (P. Mathur and H. Ezekiel, 1961; T.N. Krishnan, 1965) show a negative response. It appears clearly that different researchers use many different definitions and even though these definitions may be justified on the basis of the characteristics of the system studied, it must be realized that the concepts are fraught with hidden assumptions (M. Newman, 1977).

2.4 A Framework for Studying Rural Food Marketing

The review of literature shows the existence of many approaches for studying agricultural marketing in development. They all yield valuable insights in one aspect or another. However, the descriptive studies by geographers, sociologists, and anthropologists do not provide policy recommendations for improvement, feasibility studies do not include social relationships, and finally, many economic diagnostic assessments

patterned to the structuralist interpretation of the S-C-P approach are too narrow to provide workable recommendations to policy decision makers.

To remedy these weaknesses, Harrison, et al. (1974), J. Shaffer (1970), Slater, Riley, et al. (1969), on the basis of their experiences from Latin America, have suggested a broad approach to study and formulate recommendations about food marketing in development. This approach is based on a modified S-C-P framework and emphasizes market processes as economic coordination activities in a food distribution system. It uses a descriptive-diagnostic-prescriptive approach and the focus on marketing system avoids the sterile dichotomy between production and marketing. Market coordination is defined as "the process in an exchange system[5] whereby producers, distributors, and consumers interact to exchange relevant market information, establish conditions or exchange, and accomplish physical and legal transfer of economic goods" (K.D. Harrison, 1966). A key to the understanding of market coordination is the analysis of market participants' standard operational procedures (SOP). In addition, the approach to market system diagnosis argues that the performance[6] of agricultural marketing systems can be improved through a variety of government active interventions owing to the observation that "the most important marketing problems related to

[5] A. Schmid and J. Shaffer (1964, p. 13) define the exchange system as the "subset of the social system governing transactions between individuals and groups which result in the exchange of property rights of future control of assets." The exchange system (intangible social relationships) and the physical distribution system (tangible physical relationships) make up the marketing system.

[6] Performance refers to economic consequences such as "efficiency in the use of resources in marketing activities, effectiveness in market coordination, fulfillment of consumer quality preferences, and competitive flexibility and willingness of market participants to innovate and progress" (K.D. Harrison, 1974, pp.4-5).

achieving the desired structural transformation are in the design and promotion of new technologies and new institutional arrangements which may be unprofitable or unavailable to individual market participants, but if adopted by all participants, could yield substantial system improvements" (H. Riley and M. Weber, 1979, p. 13).

To facilitate the study, the food-distribution system may be broken down into three levels or entry points: (1) the farm or firm (trading enterprise) level; (2) the marketing channel level; and (3) the system level. In particular, the analysis at the channel level focuses on commodity subsystems defined as "the entire set of activities performed in the production, assembly, processing, distribution, and consumption of a single product" (K.D. Harrison, 1974, p. 56), where vertical coordination refers to ways, such as the price mechanism and/or administrative regulated system, of harmonizing the vertical stages of a food-distribution process (K.D. Harrison, 1974, p. 27).

The framework of the present study takes from the descriptive diagnosis approach. However, local conditions and information resources (see Chapter 4) require an adaption of the approach. The study focuses on two staple crops, sorghum and millet. It stresses producers' decision making at the farming system and at the channel level. Standard operating procedures of major participants at the channel level are also analyzed. Problems of participants are diagnosed as information permits and recommendations for improvement are suggested.

2.5 Summary

Agricultural marketing plays a dynamic role in the economic development process. But to study agricultural marketing in development, its subject matter and multidisciplinary nature must be recognized. In

particular, one must go beyond narrow approaches which yield unrealistic recommendations to decision makers. The broad descriptive-diagnosis-prescriptive approach provides a useful framework for such studies. This study takes from that approach, but should only be considered as an entry point in this framework because resource limitations restrict its scope.

CHAPTER 3

MAJOR TRENDS IN FOOD GRAIN MARKETING IN UPPER VOLTA

3.1 Introduction

The regional food marketing system is bounded and influenced by the national economic, political, and institutional environment. An understanding of this environment is required in order to put into better perspective the understanding of the food grain marketing system in the Eastern ORD. To do so, this chapter provides an overview of the evolution of the grain marketing issues in Upper Volta over the last decade.

The chapter discusses the general trends in economic growth and food availability and the public debate over the food grain marketing issues.

3.2 General Trends in Economic Growth and Food Availability

Upper Volta is primarily an agricultural country. More than 80 percent of the estimated 6.5 million people are dependent on the agricultural sector. In recent years, the role of this sector in the national economy has been declining, but it still provides 39 percent of the Gross Domestic Product with crops contributing 24 percent and livestock 15 percent. The agricultural sector is dominated by two crops, sorghum and millet, which are cultivated in 90 percent of the arable land and accounts for more than 70 percent of the gross value of crop production (World Bank, 1982a). Agriculture provides over 90 percent of recorded foreign exchange earnings. Despite its modest contribution to GDP,

"livestock alone furnishes from one-third to over two-fifths of exports" (World Bank, 1982b, p. 10). The major export crops are cotton, groundnuts, and sesame. Shea nuts, a gathered product, also play an important role in export.

According to World Bank's estimates, the country has experienced a strong growth rate in 1977-79, 4.7 percent in real terms. However, per capita income of $180 is still very low. There is a high population density, especially with respect to the arable land, because of the small size of the country and the small proportion of its arable land (33 percent of the country). The low per capita income and the high population density contribute strongly to migratory flows that were instituted by the previous colonial power. The World Bank estimates that the longer-term prospects for economic growth are less encouraging than the 1977-79 performance.

Another discouraging trend is that of the food situation. According to USDA figures,[1] total food production per capita has been lagging behind population growth since the 1969-71 period. Sorghum and millet production per capita picked up for three years after the 1968-73 drought, but since then has slipped behind population growth. (Because of the migration, the World Bank estimates that the growth rate of the total resident population hovers around 1.6 percent). Consequently, food imports, made mostly of cereals and flour, have increased dramatically over the same period. From the annual average value of 600 to 800 million FCFA before 1968, food imports have ballooned to an average value of 3 billion FCFA since 1973 (World Bank, 1982a). The fact that

[1] See USDA's "World Indices of Agricultural and Food Production," Statistical Bulletin Numbers 669, 689, and 697.

a main part of the food import is food aid is only testimony to the lack of resources of the country.

Nevertheless, many studies point out that Upper Volta has the potential to reach food self-sufficiency during normal years (see CILSS, 1977; and World Bank, 1982a). While the Central part of the country is overpopulated with respect to agricultural resources and constitutes the main grain deficit area, the Southwest and, to some extent, the Southeast are thought to have large food production potentials if provided with the right mix of development incentives. But the interregional productive differences and the overall variability of food supply induced by erratic rainfall put food grain distribution in the forefront of the government strategy of food self-sufficiency: Even if production is increased so as to cover everyone's needs, food still has to be made available at the right time and place to all consumers.

The awareness of the importance of the food grain marketing by public officials coincides more or less with the declining food production per capita and the squeeze on total food availability in different parts of the country put on by the 1968-73 drought. Local urban pressure groups, food donors, and other international development agencies have jointly contributed to an attitude of more and more direct public intervention in the food grain marketing in a pattern similar to that of neighboring countries such as Senegal, Mali, and Niger.

3.3 Evolution of the Debate on Food Grain Marketing

3.3.1 The Private Trade

For centuries, sorghum and millet have been traded throughout the Sahel, both on a local basis and in the long-distance trade (see

Chapter 2). In Upper Volta, however, the rise to preeminence of local merchants has a more recent history. Beginning in 1954, French colonial trade companies, which dominated the entire country since 1945, started to scale down their scope of operations and retreat into the two major cities of Ouagadougou and Bobo Dioulasso in order to reduce logistical costs. This strategy opened up new opportunities in the countryside, first for Lebanese and then for local traders. They were contracted by the French companies to bulk export crops (groundnuts, sesame, shea nuts) and even distribute locally a line of imported consumer goods. The capital accumulated through 1959 to 1966 enabled many merchants to expand their scale of operations in grain marketing (D. Bollinger, 1974).

Today, there is a powerful grain merchant union which the public authority has to reckon with. The network of private traders provides assembly, bulking, transportation, and storage of grain on a larger scale than public agencies. Unfortunately, it appears that the public authorities have often confused the mishaps of aggregate performance of the food grain marketing system with the belief that private traders can be replaced altogether.

3.3.2 Historic Perspective of Government Interventions in Food Marketing

The first effective attempt by a Voltaic government agency to control agricultural marketing can be traced back to 1964 with the establishment of the Caisse (Caisse de Stabilisation des Prix des Produits Agricoles - CSPP). The mandate of the Caisse was to: (1) stabilize the producer prices of groundnuts, sesame, cotton, shea nuts (harvested from semiwild trees), and paddy rice; (2) promote the export of these products (except rice whose domestic production hardly covers local demand);

and (3) increase their productivity. The motivation provided for the establishment of the Caisse was that France, because of its entry into the EEC (European Economic Community), could no longer offer directly advantageous terms of trade for products exported by its former colonies. Another motivation was that too much competition, introduced by too many traders vying for the farmer's produce, was alledgedly responsible for the producer price fluctuations. Public intervention was therefore deemed necessary.

The Caisse, however, allowed the whole marketing organization (assembly, bulking, transportation, and export) to remain in the hands of licensed private and public institutions and concerned itself with export pricing and taxation: On the basis of a minimum producer price and a reasonable profit margin, a reference export price was set within a range (fourchette) of a ceiling and a floor price based on past and projected world prices. The price stabilization scheme called for the Caisse to refund exporters the difference between the reference and the floor price if actual world price fell below the floor price, and the exporters to pay the Caisse the difference between the world price and the ceiling price if the world price rose above the ceiling price.

This pricing arrangement always worked in favor of the Caisse until 1974 when large funds had to be disbursed to compensate exporters who had paid high prices to producers, but stood to lose money because of unfavorable world price movements. Since then, the Caisse has been positioned as the sole exporter of groundnuts, sesame, and cotton

seed.[2] The licensed traders must now sell all their products to the Caisse (CILSS, 1977; CSPP Annual Reports).

In 1966, the Voltaic government started the establishment of Regional Development Organizations (ORD for Organisme Régional de Développement) in all 11 regional administrative units (Départements) of the country. The ORD system is a departure from the former one-commodity agricultural development approach and signaled a more integrated rural approach at the regional level. The ORD mandate was to coordinate all development efforts (and implement some) at the regional level through its network of multipurpose extension agents (agents de developpement communeautaire). A particularly interesting aspect of the ORD status was that each may engage in revenue-generating activities in order to self-finance its development activities.

The above legal provision opened up the door to the various marketing operations the ORD engaged in. In July 1968, to help the ORDs achieve financial autonomy, the government granted them the monopoly rights[3] to purchase export crops (groundnuts, sesame, and shea nuts) from producers. These monopoly rights lasted only two buying campaigns and were repealed in 1970 because of the ORDs' poor performance. Very few ORDs (only Bobo, Banfora, and Bougouriba had sizable purchases)

[2]The cotton subsector is vertically integrated by CFDT (Compagnie Francaise pour le Développement des Fibres Textiles, a private French corporation). CFDT has now formed a partnership with the Voltaic Government in SOFITEX (Societé Voltaique des Fibres Textiles) in a pattern that is repeated throughout all former French colonies in Africa. The company has the monopoly for cotton input distribution, cotton ginning, and lint export. Public institutions (ORDs), which help organize cotton assembly, are paid a commission.

[3]Traders, licensed (agréés) by the Caisse, were also granted the same rights.

actually participated, either because of lack of interest or lack of financial and managerial capabilities. There was also no help from either the Caisse nor the National Bank of Development (BND). Actually, the monopoly did not hold, for even nonlicensed private traders were allowed to collect the produce. Furthermore, the ORDs, their organizational system overextended by the marketing function, were forced to contract with private traders to bulk or move out products.

Yet, during the 1968-70 episode, the ORDs were introduced, if only marginally, to food grain marketing, for a number of farmers brought grain along with export crops to the ORDs' buying points. So far, however, in spite of public statements to the contrary, the government agricultural policy had been biased toward export crops. A testimony to the fact that extension and marketing efforts were better articulated for export crops than food crops is provided by the relatively well-structured operations of the Caisse and CFDT, and by the 1968-70 attempt to monopolize export crop marketing. The drought that plagued Sahelian states from 1968 to 1973 helped bring food crop orientation in government policy in the forefront.

It is only in 1971 that the Voltaic government actually began active interventions in the grain marketing system by creating a grain marketing board, OFNACER, Office National des Céréales. The mandate given to OFNACER was to stabilize producer and consumer prices by grain purchases in surplus areas and sales in deficit areas. Grain was also to be purchased in bumper crop years to be sold in deficit years in order to smooth out interannual prices. To achieve these goals, OFNACER set up a target of 30,000 to 40,000 tons of grain to be purchased every year. In addition, OFNACER was also to build an emergency food grain

reserve. The establishment of OFNACER follows the pattern of food crop agencies in neighboring countries (in Mali, OPAM was created in 1965, in Senegal, ONCAD was created in 1965, and in Niger, OPVN was created in 1970).[4] It follows also the need for a central agency that would handle the growing flow of food aid given to relieve drought stricken victims. In fact, in its first few years, OFNACER's actual role was largely to manage the storage and distribution of food aid.

Abruptly, in 1974, the government granted the monopoly rights of grain assembly to the ORDs and traders licensed by OFNACER which, in turn, was given the monopoly of grain distribution to consumers. The objectives of the reform was to: (1) reduce alleged excessive private speculation; (2) promote rural organization by encouraging farmers' participation in agricultural marketing and introducing better grain measurement devices; and (3) provide the ORDs with a self-financing operation.

By virtually all accounts, the 1974-75 campaign was a disaster (see CCDR, 1975; CILSS, 1977, Vol. II; D. Wilcock, 1977, pp. 194-239; and OFNACER reports). First, the decision was taken without knowledge of food grain marketing conditions which are different from those of export crops. Second, the ORDs, which already lacked the financial, managerial, and logistical means, did not have much lead time to set up their buying networks. Third, the Bank (BND) was also caught by surprise, and reflecting the disastrous 1968-70 campaigns, did not rush to loan money to the ORDs or OFNACER. In fact, for a campaign that was to start in November and end in March, the ORDs did not get any funds from BND until

[4]OPAM stands for Office des Products Agricoles du Mali; ONCAD, Office National de Cooperation et d'Assistance pour le Developpement; and OPVN, Office des Products Vivriers du Niger.

late January, and OFNACER did not receive enough funds to buy from the ORDs. Fourth, the official prices (22 FCFA/kg. to the producer and 37 FCFA to the consumer) were unrealistic: Because of good harvests, the actual market consumer price was around 30 and the producer price below 22 (CILSS/Club du Sahel, 1977, pp. 22-23). These market conditions prompted OFNACER to buy from private traders and not from the ORDs. Fifth, in the meantime, the ORDs sold at 28 FCFA/kg. to international organizations (OSRO[5] and FAO) which were attempting to build food reserves from local sources. In addition, another public institution, the Sous-comité[6] was distributing grain from food aid at 15 CFA/kg., thus, undercutting OFNACER's efforts.

The confusion of the 1974-75 campaign was carried into the next year. Prior to the 1975-76 campaign, the ORDs tried to unload their carryover stocks to OFNACER. But OFNACER could not buy because its own storage facilities were filled with unsold imported maize. Therefore, the ORDs were forced to default on their loans extended by BND. Furthermore, they had to discontinue their operations, which, coupled with the fact that they intervened late the previous year, was very instrumental in creating the mistrust that producers now show with respect to the ORDs' marketing capabilities. In fact, it would appear that the only gainers of the 1975's grain monopoly experience was again private traders who stood ready to buy when producers wanted to sell, and who were also contacted by the Ords and OFNACER to provide transport services in many instances. By 1976-77, virtually all ORDs had ceased to intervene in the grain marketing.

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[5]OSRO is a UN/FAO drought relief operation.

[6]Sous-comité de Lutte Contre les Effects de la Sécheresse (subcommittee to combat the effects of the drought).

The E-ORD, which had been just officially instituted in 1974, had also very poor marketing campaigns during this episode. It had attempted to involve farmers,[7] but its hierarchical and centralized marketing network, which required too many decisions to be made at the central headquarters, was too rigid to be effective. As a result, funds were not delivered on time to buying agents and the situation of the stock (held in local warehouses, in extension agents' and farmers' houses, or left in the open) was very confused. In 1974-75, the E-ORD never achieved more than 43 percent of its target in millet and sorghum purchases (E-ORD reports). Even worse, by "December 1975, the ORD had not been paid for over 80 percent of the sorghum and millet it had delivered...to national grain marketing (agencies)" (Eicher, et al., 1976, p. 24). Consequently, it defaulted on loans extended in 1974 and did not receive funds in time in 1975 so that the 1975-76 campaign was temporarily cancelled in December 1975.

In 1978, the official grain monopoly rights granted to the ORDs and OFNACER were repealed.[8] OFNACER administration, which up to now was under the Ministry of Commerce, was now brought under the Ministry of Rural Development which oversees also the ORDS. OFNACER was now to collect grain from its own agents, its licensed traders, and village groups (groupement villageois). But, in fact, OFNACER buys also from

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[7]During the 1974-75 campaign, 76 village groups (groupements villageois), 138 village committees (comite's villageois which are set up where there is no village groups), 17 4C Clubs (youth organizations), and 11 "isolated intermediaries" could act as buying agents for the ORD in addition to some of the ORD own extension agents (Eicher, et al., 1976, p. 27).

[8]Donor agencies, which were dissatisfied with the monopoly rights, played some role in this new change of policy by holding or delaying their contributions (D. Wilcock, 1977, p. 201).

nonlicensed traders. Thus, a more liberal market view has been adopted. But OFNACER still holds fast to targets of grain purchases of 30,000 tons in order to affect grain price movements and control price fluctuations. Furthermore, it has also targets for emergency food reserves of 30,000 tons, a three-month food grain supply reserve.

Another development in food marketing has been the creation of Cereal Banks, whereby producer precooperatives engage in grain transactions in order to meet their members' food requirements during the hungry season. According to CILSS (1979), more than 30 such Cereal Banks were built between 1975 and 1979. A few more Cereal Banks were also to be built in the Eastern region.

Today, OFNACER has clearly emerged as the main instrument of the government food marketing policy. However, OFNACER's performance is still not very satisfactory: (1) OFNACER's local grain purchases have always remained below its target of 30,000 metric tons. Even in the 1978-79 season, regarded by OFNACER as its best ever (as in 1981), it managed only half of its target. In fact, OFNACER's operations are still dominated by its food aid sales in urban centers (see OFNACER's purchases and sales in Tables 3.1 and 3.2).

Because OFNACER purchases small quantities, its impact on the level of producer prices is rather nonexistant. It may only possibly affect price levels in areas of difficult market access and large producing areas. But OFNACER may have an effect on consumer prices in urban cities because of its concentration on urban cities and the relatively large volume of food aid available for sale.

The food reserve built up by OFNACER obviously cannot come from its local purchases. Instead, food aid has been sought to build up the

Table 3.1

OFNACER Cereals Operations, 1971/72 - 1978/79

	1971-72	1972-73	1973-74	1974-75[a]	1975-76[b]	1976-77	1977-78	1978-79[e]	1979-80[f]
Cereal Purchases on Local Markets									
Quantities	1.54	0.76	2.77	15.40	16.81	9.78	8.78	15.29	10.00
Values	32.78	16.12	..	569.10	--	205.34	281.10	688.52	--
Cereal Imports[c]									
Quantities	35.29	27.41	29.54	24.75	5.82	18.83	50.47	36.24	..
Values	534.56	479.95	..	639.69	--	1,480.98	2,866.02	2,557.38	..
Total - Quantity	36.83	28.17	32.31	40.15	22.63	28.61	59.25	51.53	..
Values	567.34	496.07	..	1,208.79	--	1,686.32	3,147.12	3,245.90	..
Cereal Sales on Local Markets									
Quantities	30.75	24.93	33.02	28.01	21.03	28.35	24.60	33.32	..
Values	539.11	469.80	..	685.65	--	1,366.93	1,165.92	1,042.59	..
Changes in Stocks (Increases +)									
Quantities	6.08	3.24	-0.71	12.14	1.60	.26	34.65	18.21	..

Source: World Bank, 1982a.

[a]Until 1974-75, purchases and sales of rice were the responsibility of the Societe Voltaique de Commercialisation (SOVOLCOM).

[b]Revised from original table.

[c]Imports made under food aig programs.

[d]Including some free distribution.

[e]Sales data through 3/31/79 only.

[f]Rounded.

Table 3.2

Table 3.2a. OFNACER Grain Purchases, 1978-79

Region/ORD	OFNACER Agents	Village Groups	Unlicensed Traders	Licensed Traders	Total
Fada	913	-	301	-	1,214
Koupela	1,387	87	23	-	1,497
Kaya	1	21	-	-	22
Ouagadougou	1,831	1,513	609	305	4,258[a]
Koudougou	361	-	66	150	577
Ouahigouya	72	128	3	61	264
Dedougou	2,265	-	640	365	3,270
Bobo	128	2,217	1,175	357	3,877
Dori	113	126	52	15	306
Total:	7,071	4,092	2,869	1,253	15,285
Percent:	46	27	19	8	100

Source: OFNACER

Note: Target was set at 30,000 metric tons.

Table 3.2b. OFNACER Grain Purchases in Eastern ORD, 1979-80

Center	Total Purchases (Metric Tons)	Target (Metric Tons)	Percent of Target
Bogande	11.5	300	3.8
Thion	9.4	300	3.1
Madjoari	94.4	300	31.5
Diapaga	79.2	300	26.4
Tansarga	347.5	400	86.9
Logobou	542.9	600	90.5
Namounou	287.6	600	47.9
Nadiaboualy	510.3	500	102.1
Nassougou	150.8	300	50.3
Total:	2,032.6	3,600	56.5

Source: OFNACER, CRG de Fada (preliminary estimations).

first generation of food reserves. OFNACER has also received pledges by several donor agencies for financial and technical help to build and manage large capacity grain warehouses.

3.4 The Present Issues

The issue of concern now is not whether government should intervene in the market system. In spite of the lack of coordination among public agencies and the poor performance of OFNACER, the present trend and the political environment (local and international; that is, donor agencies) indicate clearly that the government will continue to intervene.[9] Consequently, the practical issue is how to help the government provide better tools and information to help provide benefits to producers and consumers, while at the same time, helping the private sector to play a more productive role in grain marketing.

From the review above, it appears that many government interventions were undertaken without prior and adequate knowledge of the functioning of the local food marketing system. The limitations of the public institutions were not recognized, while the eventual strengths of the private institutions were ignored and their shortcomings were amplified. Even the eagerness to help producers participate more in food marketing may backfire if their linkages with the marketing system are not recognized for what they actually are.

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[9] In Senegal, ONCAD was abolished in 1979 because of gross mismanagement. Its mandate, however, is being shared by several new parastatal institutions (G. Frelastre, 1982).

Because of the relatively large size of development aid in Sahelian countries, donor agencies are in a position to control the magnitude of this intervention, however.

Obviously, not all important issues discussed at the national level can be addressed by a regional and micro-level study such as this one. There are, in such a study, however, important regional features which highlight some of these issues. The regional emphasis given to rural development commands that these particular features be examined in order to contribute to a national policy harmonious, yet diversified enough, to suit regional differences. This study is conducted in that spirit.

CHAPTER 4

RESEARCH DESIGN AND INSTRUMENTS

4.1 Introduction

The objectives of the chapter are twofold: one is to describe the main physical and institutional characteristics of the study site, the Eastern region of Upper Volta; the other is to present the methods of collection and the limitations of the data that support the study.

4.2 Study Site

4.2.1 Main Physical Characteristics

The Eastern region of Upper Volta, with 49,992 square kilometers, represents close to 20 percent of the area of the country and is its largest administrative unit (see Figure 4.1). It stretches from the margins of the Sahelian ecosystem in the North to the margins of the Savanna in the South, and is characterized by heterogeneous ecological conditions and human settlement patterns.

Rain, with averages of 600 mm in the North and 1,000 mm in the South, falls only in the short span of May-June to September-October with a high degree of variability (see Figure 4.2). The climatic and soil conditions are the main determinants of the physical environment and the land use potential. The North of the region is considered suitable for livestock, while the Center and South are suitable for cereal crop production (see Table 4.1). In addition, a major part of the South

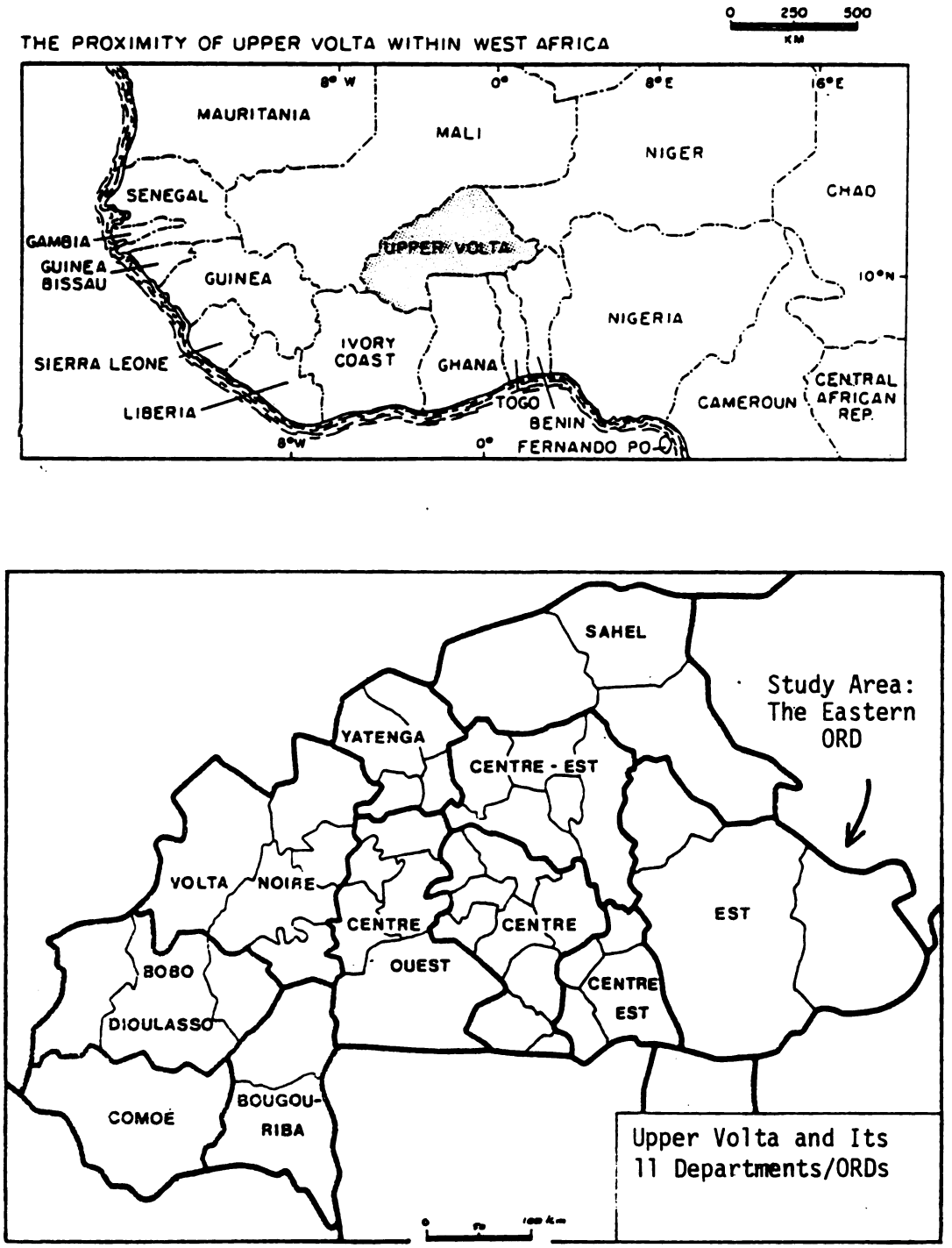
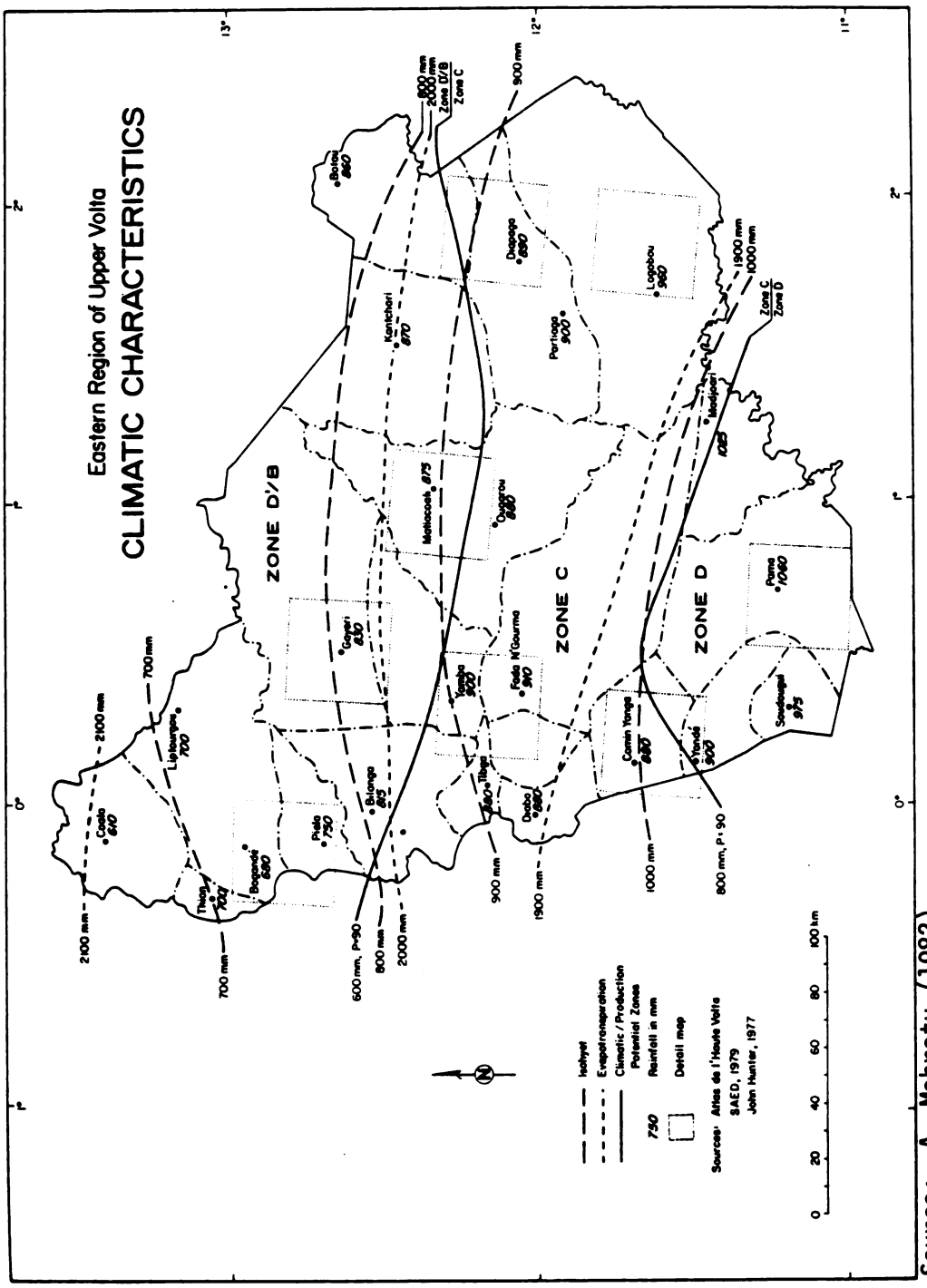


Figure 4.1

Upper Volta: Proximity Within West Africa and Departmental Boundaries



Source: A. Mehretu (1982).

Figure 4.2

Eastern Region of Upper Volta: Climatic Characteristics

Table 4.1

Agroclimatic Characteristics of Surveyed Zones

Zone	Approximate Population Density[a] (persons/km^2)	Dominant Ethnic Group	Major Soil Types[b]	Estimated Longterm Average Rainfall[c]	Listed by Order of Importance: Major Crops	Livestock Types
1. Bogande	27.1[d]	Gourma	leached sandy soil	690	millet • sorghum • sesame, groundnuts	goats, sheep, cattle
2. Mani	17.8[e]	Gourma	leached sandy soil	610	sorghum • sesame, groundnuts	sheep, goats
3. Piela	32.1	Gourma	leached sandy soil	750	millet • sesame, groundnuts, rice	goats, sheep, cattle
4. Diabo	38.3	Mossi	poor lateritic soil	880	millet • cowpea, groundnuts, rice	goats, sheep, cattle
5. Logobou	40.0[f]	Gourma	silty to sandy clay	960	sorghum • cowpea, sorghum • Niadi[g], groundnuts, rice, tubers	sheep, goats, cattle (taurin)
6. Partiaga	28.2	Gourma	hydromorphic black clay or sandy clay	900	sorghum • cowpea, maize, rice, tubers, cotton	sheep, goats, cattle
7. Yonde	13.0	Mossi	black clay overlaying hydromorphic vertisols	900	millet • sorghum • cowpea, groundnuts	goats, cattle, sheep
8. Diapangou	14.7	Gourma	clay and sandy clay	910	sorghum • millet • cowpea	cattle, sheep, goats
9. Botou	14.9[h]	Gourma	sandy clay and black clay	858	sorghum or millet • cowpea • sesame, groundnuts, cotton	cattle, goats, sheep
10. Kantchari	4.3	Gourma	sandy to sandy clay	870	sorghum • millet • cowpea, maize, manioc, cotton	cattle, sheep, goats
11. Jugarou	3.6[i]	Gourma	clay	880	sorghum • cowpea, maize	cattle, sheep, goats
12. Pama	2.7	Gourma	hydromorphic black clay or sandy clay	1060	sorghum • cowpea,m sorghum • Niadi[g], tubers, cotton, rice	goats, cattle (taurin)

Source: G. Lassiter, 1982.

[a]1979 estimates taken from Mehretu and Wilcock (1979, Table 3, p. 20).

[b]From Bureau de Production Agricole, "Determination des Zones Homogenes en Vue de l'Installation d'Un Reseau d'Essais Multilocaux," ORD de l'Est, Fada N'Gourma, Upper Volta, August 1977.

[c]From J. Weldring, "Synthese sur les Amenagements Hydro-Agricoles dans l'ORD de l'Est: Fada N'Gourma," Direction du Fonds Developpement Rural, Ouagadougou, May 1979, pp. 5-6. Weldring took his figures from an uncited 1974 S.A.E.D. report and thus they probably represent 20-year rainfall estimates extrapolated from a few national rainfall stations from similar latitudes. In cases where Weldring did not present an estimate for a survey village, regional averages were used: Bogande (Bogande + Thion), Mani (Coala), Botou (Bilanga + Yamba), and Diapangou (Fada N'Gourma).

[d]Density for Thion canton used.

[e]Density for Coala and Bogande cantons used.

[f]This is a rough estimate of the effective population density in the survey area. The density of the Gobnangou canton is only 9.8, but the majority of the canton area is nonarable rock ridge or wildlife reserve.

[g]Niadi is a short season, 60-day millet grown only in the wetter regions of the EORD.

[h]Density for Bilanga canton used.

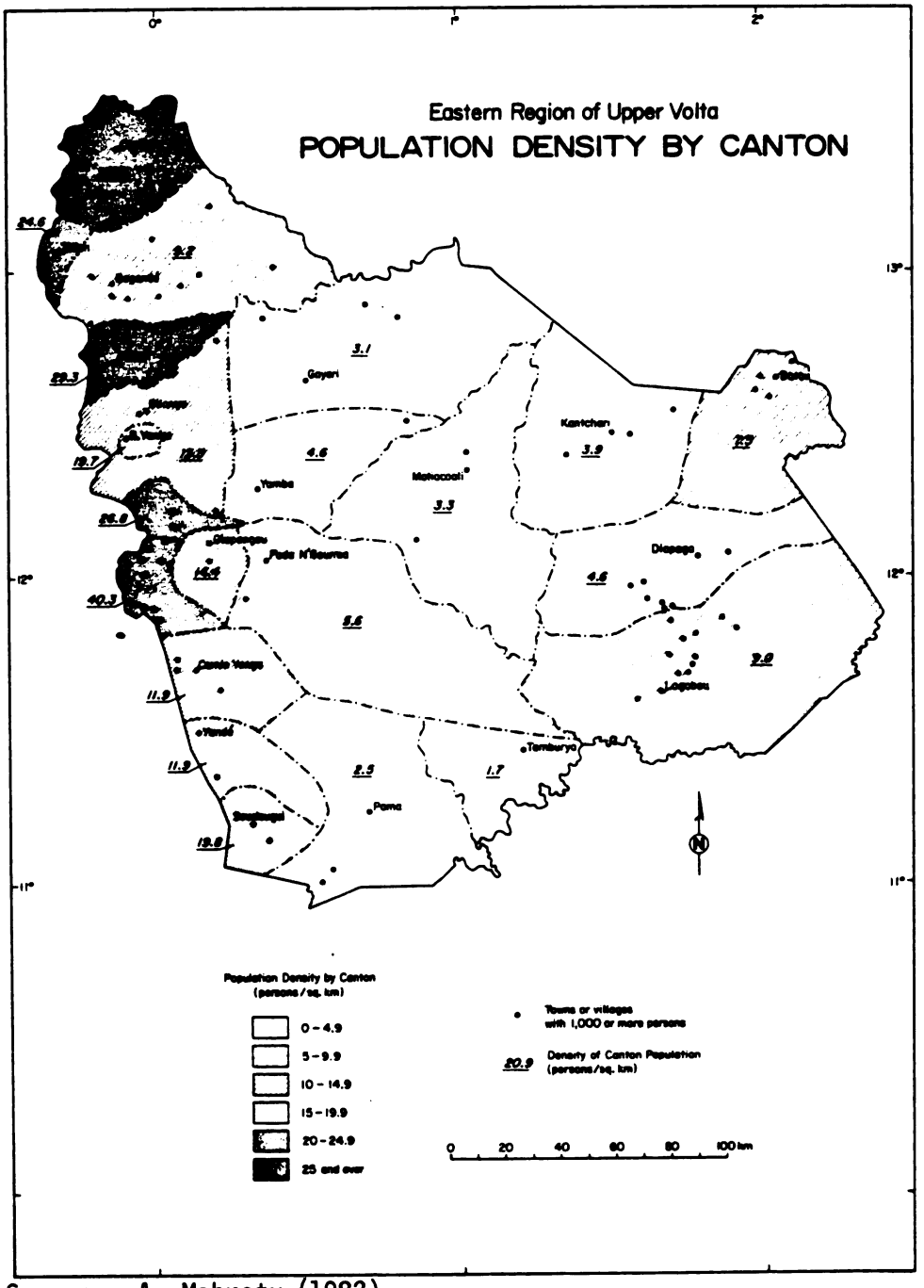
[i]Density for Matiacoali canton used.

and Southeast (Pama, Arly) is covered by forest formations which host one of the richest wildlife habitats in West Africa. Because this portion may also have the highest agricultural potential, there is a potential conflict between the development of wildlife and agricultural resources.

The Eastern region, while being the largest in size, is also one of the least populated area of the country: it hosts only 7 percent of the nation's population, and its density is eight people per square kilometer, whereas the average of the country is close to 25 people per square kilometer. More importantly, however, it has a very uneven population distribution.

Although the Western stretch, from Coalla in the North to the Togolese border, covers only some 25 percent of the area, it contains more than 50 percent of the population (A. Mehretu, 1982). Elsewhere, the population is mostly clustered in centers and what remains has very sparse population settlements (see Figure 4.3). It appears as if the population settlements have been oblivious to the climatic and soil conditions, which results in a very unequal pressure on the land endowed with different potentials. For example, the driest part, in the North, is more populated than the wetter and richer part in the South.

This uneven population distribution can be related to the ethnic make-up: Mossi, the dominant ethnic group in Upper Volta, and affiliated groups are mostly found in the West which borders the predominantly Mossi areas of Koupela and Kaya ORDs. Fulani are found in the North, and Gourmantche--the dominant ethnic group in the Eastern region--are found elsewhere. Thus, this population distribution may be explained by historical reasons. But another part of this uneven distribution can



Source: A. Mehretu (1982).

Figure 4.3

Eastern Region of Upper Volta: Population Density by Canton

also be explained by the fact that the South is infested by the simuli fly which causes "river blindness" (onchocerciasis), a deterrent to human settlements.

4.2.2 Relevant Institutional Characteristics

The Eastern region is one of the 11 Départments in Upper Volta, and also one of its 11 ORDs (Regional Development Organizations). While the Eastern department is administered by the highest ranking official in the region, the Prefet, who is accountable to the Ministry of Interior, the Eastern ORD (E-ORD) is administered by a director who is accountable to the Ministry of Rural Development. The headquarters of both the Department (the Prefecture) and the ORD are in Fada, the regional center.

The E-ORD, in theory, is the coordinator of, and the main agency responsible for, all economic development efforts in the region. In particular, it is charged with developing agricultural production, livestock, agricultural water resources, and forestry and tourism.[1] But, in fact, it concentrates almost exclusively on agricultural extension. For that purpose, the region has been divided into sectors (eight), the sector into subsectors (23), which coincide approximately with the cantons (traditional administrative unit), and the subsector into extension zones. The zone, in turn, is made up of a group of villages. A certain number of villages are officially structured into village-groups (Groupement Villageois), a sort of precooperatives which are being promoted as

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[1] The ORDs were given mandate to coordinate development efforts in forestry, wildlife, and tourism in 1974 when the Ministry of Rural Development oversaw also Forestry and Tourism. In subsequent ministerial changes, the ministries of Rural Development and the Ministry of Forestry, Tourism, and Environment were separated and the role of the E-ORD in forestry and tourism is not practically inexistent.

the cornerstone of the government's rural development policy. The overall extension system operates in a top-down approach.

Along with the Prefecture (Eastern department) and the E-ORD, OFNACER (the grain marketing board) may be considered as the third important development institution[2] operating in the Eastern region. OFNACER has its headquarters in the capital city, but in most Departments, it operates a subunit, the CRG (Centre Régional de Gestion). The CRG manages a permanent stock warehouse in Fada, has important outposts in Diapaga and Namounou, and sets up every year periodic buying and selling points according to production conditions.

Overall, the socioeconomic infrastructure of the E-ORD is very poor, even according to the standards of Upper Volta. For example, the E-ORD has the second lowest rates of school enrollment in the country, 7.8 percent as of 1979. Based on an effective service radius of about five kilometers from the health care facility, the current health delivry system covers only 4 percent of the area. Domestic water is supplied by individual wells that may dry up part of the year. Finally, assuming an effective use of all roads and motorable trails to be limited within a 10 km range along the roads, the road accessibility index reaches only 37 percent. In fact, only 13 percent of the total road system (2,823 kilometers)[3] is made up of all-weather roads (see Figure 4.4).

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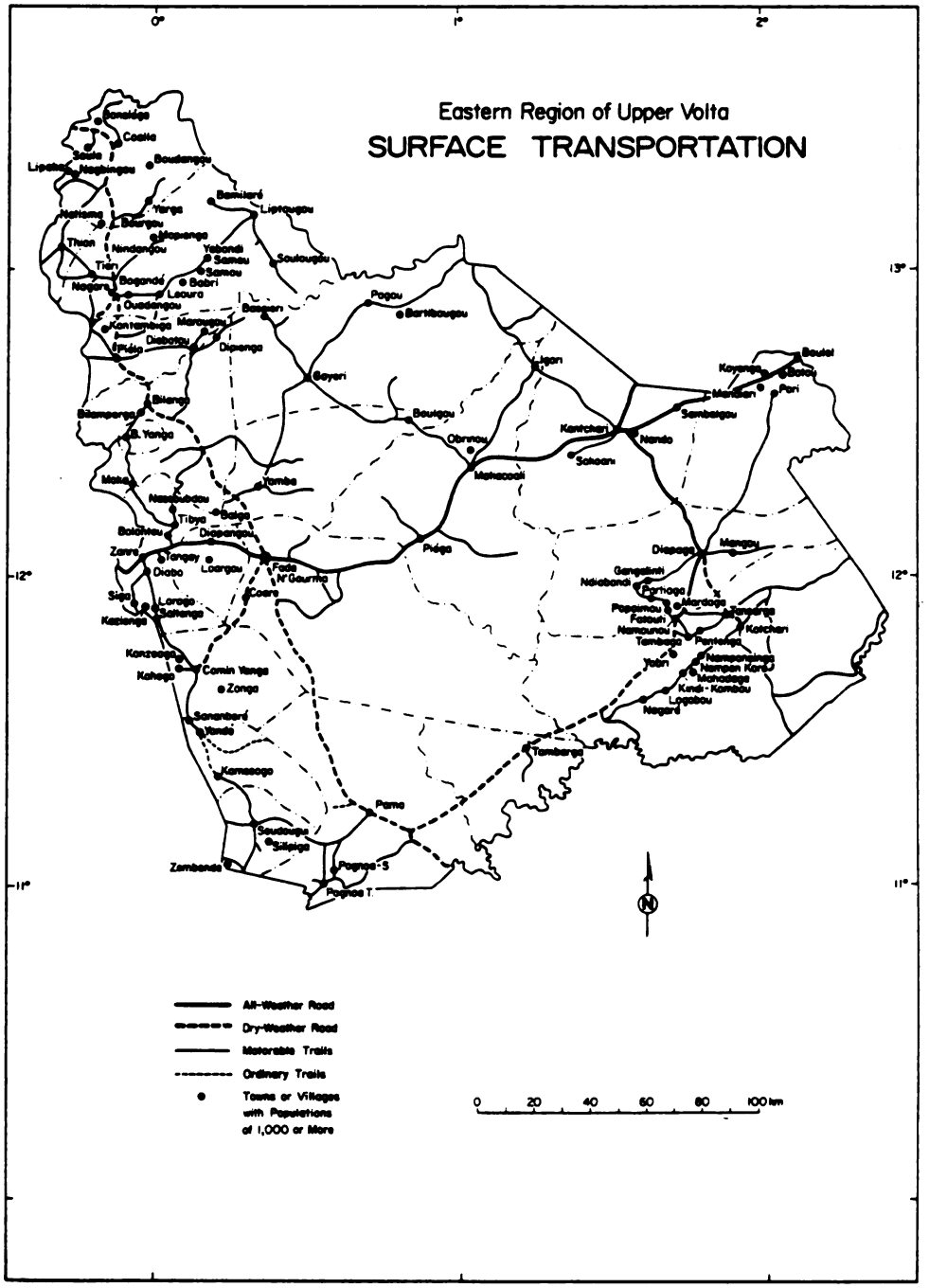
[2]Other major institutions are two bank branches of the National Bank of Development and the International Bank of the Voltas (both with government majority participation) a post office, and various religious institutions which provide development aid.

[3]Figures taken from Mehretu, 1982.



Source: A. Mehretu (1982).

Figure 4.4

Eastern Region of Upper Volta: Surface Transportation

4.3 Research Design and Instruments

This study relies on numerous sources of primary data, the most important of which is the 1978-79 MSU/E-ORD farm survey. The other sources used as a complement to the marketing information of the 1978-79 farm survey are the 1979-1980 marketing investigation and the 1980 E-ORD village census.

4.3.1 The 1978-79 Farm Survey

The 1978-79 MSU/E-ORD farm survey[4] collected information on the economic activities of 480 households surveyed in 27 villages from 12 major ecological zones from May 1, 1978 to April 30, 1979. The sample was made up of 355 "hoe" cultivating farmers (348 of whom were randomly selected and seven were village chiefs purposely included to assure political support) and 125 animal traction (ANTRAC) cultivating farmers purposely selected (see Figure 4.5 and Table 4.2).

The sample was stratified at three levels. First, 12 zones were selected to be representative of ecological conditions, population distribution, animal traction (ANTRAC) uses, and the eight sectors of the ORD. Second, from a frame list of villages of the zones identified, two villages were randomly selected in seven zones with predominant hoe farming (traditional) techniques. In the other five zones with ANTRAC use, traditional villages were randomly selected as a control group to match nonrandomly selected ANTRAC villages. Only in two of the five zones was the pairing (one traditional against one ANTRAC village) not

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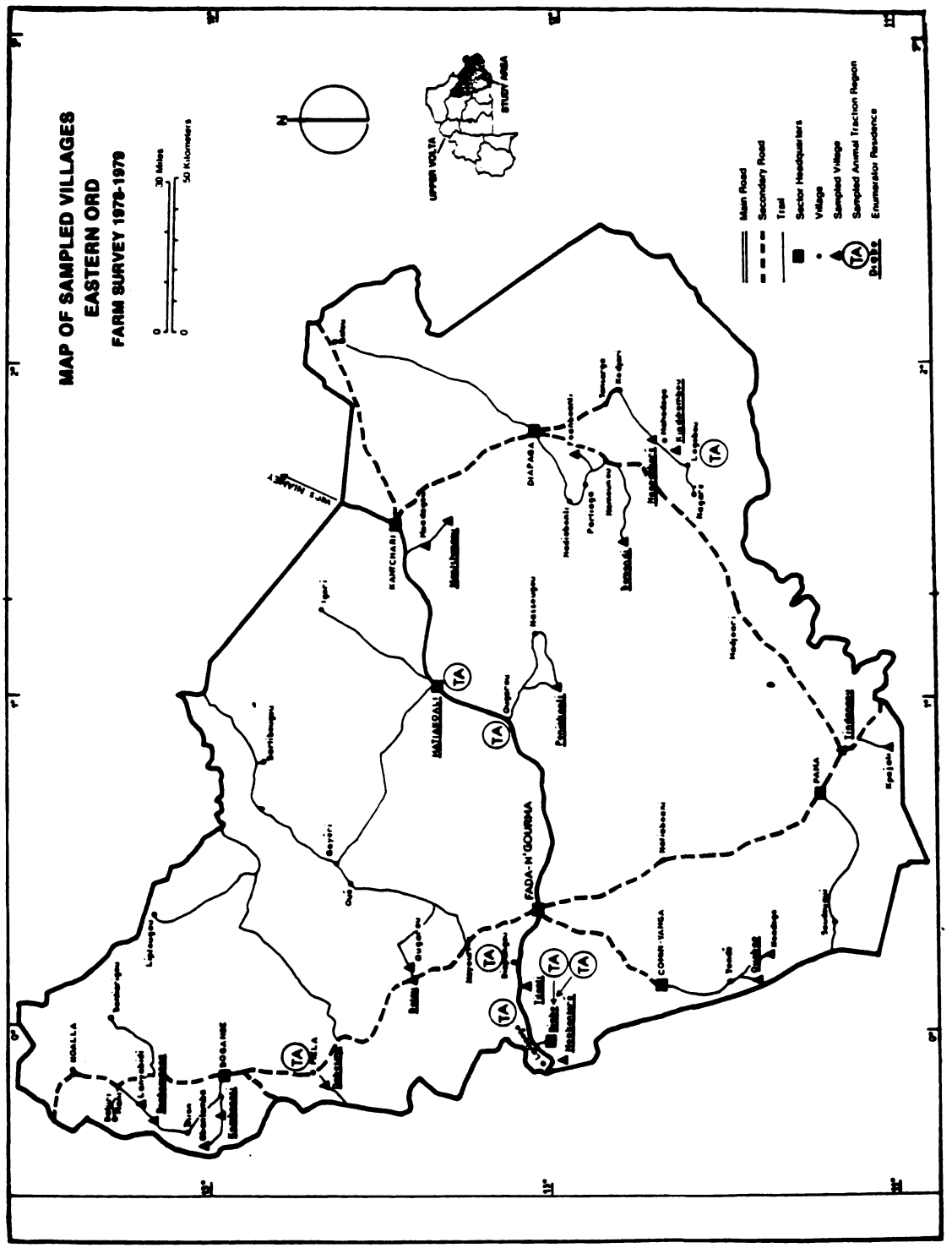
[4]The sampling and data collection procedures, and sample characteristics are very well documented in Lassiter (1982, pp. 31-42), Tapsoba (1981, pp. 30-47), and various MSU team six-month reports.



Source: ORD de L' Est - Fada.

Figure 4.5

Map of Sampled Villages: Eastern ORD--Farm Survey, 1978-79

Table 4.2

Distribution of the 480 Samples Agricultural Households by Agroclimatic Zone, Village, and Technology

Zone	Village	Number of Households in Each Village or Area		Population Estimates (1975 Census)
		Traditional	Animal Traction	
Bogande	Gbanlamba	18	--	1,160
	Komboassi*	18	--	1,119
Mani	Lanyabidi	18[a]	--	161
	Bonbonyenga*	18	--	604
Piela	Dabesma*	18	--	234
	Piela	--	18	--[c]
Diabo	Monkontore*	18	--	377
	Lantaogo	--	18	--[c]
	Diabo I[d]	--	17	--[c]
	Diabo II[d]	--	18	--[c]
Logobou	Namponkore*	18[a]	--	2,138
	Kindikombou*	18[a]	--	2,032
	Logobou	--	18	--[c]
Partiaga	Bomondi*	18	--	1,063
	Dubcaali	18	--	NA
Yonde	Ouobgo*	17	--	627
	Kondogo	18[a]	--	302
Diapangou	Tilonti*	18	--	402
	Diapangou	--	18	--[c]
Botou[b]	Botou[b]	18[a]	--	600
	Ougarou[b]	19[a]	--	547
Kantchari	Mantchangou*	17	--	525
	Moadagou	18	--	285
Ougarou	Poniokonli*	18	--	315
	Ougarou	--	18	--[c]
Pama	Tindangou*	16	--	462
	Kpajali	16	--	NA
Total:		355	125	--

Source: 1978-79 Farm Survey and 1975 Population Census.

*Residences of enumerators.

[a]Village chief included as a nonrandomly selected household head.

[b]North of Fada.

[c]1975 data missing because of confusion over names of villages.

[d]In some computerized data files, Diabo I and Diabo II make up another zone, the 13th.

respected: in Diabo, three ANTRAC villages were selected against one traditional village, and in Logobou, two traditional villages were selected against one ANTRAC village. Third, in the 20 randomly selected traditional villages, 18 households per village were selected (village chiefs were purposely selected in seven villages), but in all seven non-randomly selected ANTRAC villages, 18 households were purposely selected by extension agents for their successful use of ANTRAC in the village (see Table 4.2).[5]

The 1977-78 farm survey used a "cost-route" approach of flow data collection. That is, multiple interviews are regularly spaced throughout the year in order to reduce recall errors of flow data. The questionnarie, patterned to Matlon's data collection method in Nigeria (1977), was disaggregated by activities: crop harvesting, sales of farm crops, sales of grain bought for trade or processing, etc. Furthermore, heads of households were asked to recall information on a weekly basis, for it is thought that the weekly recall period may help farmers better focus on past activities. In a few other cases, farmers were interviewed weekly to collect labor data, or three to four times during the year, or only once to collect such information as consumption, grain stock, household personal characteristics, etc.

This detailed "cost-route" approach and questionnaire design creates a very large quantity of data and requires close supervision. To meet this requirement, one enumerator speaking the local language was assigned to two villages, and supervisors visited the enumerators

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[5]The source of the village and household lists is the 1975 population census. Because of the low population density of the region, it is assumed that village size is independent of the farming system.

regularly to check on the accuracy of the data. Further checking was made at the E-ORD headquarters and at CENATRIN (computer center in Ouagadougou) where the coded data were punched, edited, and recorded on tape. This study uses the MSU-computerized data files which relates to grain marketing (see next section, and Chapter 6 in particular).

4.3.2 The 1979-1980 Food Grain Marketing Investigation

The 1979-80 food grain marketing investigation was carried out by the author from July 1979 to July 1980[6] as a complement to the 1978-79 farm survey. Because there was no basic food grain marketing information available for the Eastern region as of July 1979, preliminary information on the physical market infrastructure, the identification of the main market participants, and the nature of market processes had to be gathered before any in-depth analysis could be conducted at the village level. Unfortunately, the size of the Eastern region, the very poor road conditions, and the curtailment of resources did not allow this preliminary investigation to be completed in the short time (a few weeks) it should call for. As a result, the preliminary investigation overlapped with part of the in-depth analysis which took place later during the period.

The reconnaissance of the food grain marketing system was conducted through unstructured interviews, all conducted by the author either directly in French or Moré, or through a translator when the interviewee spoke only the other local languages. On the public marketing side, all

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[6]Other lines of duty of the author included the supervision of the 1979-80 farm survey follow-up, the clean up of the 1978-79 farm survey and 1979-80 farm survey follow-up, and the preliminary analysis of the 1978-79 farm survey data. In addition, he helped design and supervise part of the 1980 Village Inventory.

23 subsector chiefs and eight out of nine OFNACER buying agents were interviewed. On the private traders side, merchants and their agents were interviewed at marketplaces and at home, when available. In addition, marketplaces were visited to gain a visual feel of their importance. Finally, all village groups who participated in 1979 and 1980 in the village cereal bank project were visited.[7]

Food marketing information was also collected at the producer level through structured interviews by enumerators from February to June 1980, once the enumerators had been freed up from the 1978-79 farm survey follow-up. Two groups of farmers were interviewed; one group from a subsample of the 1978-79 farm survey (from now on referred to as the 1980 farm survey, see Table 4.3) and the other at selected marketplaces (from now on referred to as the 1980 marketing survey).

The sample of the 1980 marketing survey at the farm level is different from that of the 1978-79 farm survey. The 1978-79 sample was reduced from 18 to six households per village in order to save resources and a few villages were dropped or added. In addition, given the time constraint and the fact that many farmers had been complaining of repeated interviewing without tangible improvement of their lot, the "cost-route" approach was abandoned in place of one-shot interview. Data was sought on producer's marketing behavior, in particular:

- perception of marketing problems;
- measurement of products; and
- marketing credit provided by merchants.

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[7] A few other village groups financing their own cereal banks were visited as well.

Table 4.3

Location of Sampled Villages of Surveyed Farmers, 1979-80 Farm Survey

Zone	Traditional	Animal Traction	Number of Households Selected
Bogande			
Mani	Lanyabidi		6
	Bonbonyenga*		6
Piela	Dabesma*	Piela Area	6
			6
Diabo	Tibga	Lantaogo Area	6
		Diabo I Area*	6
			6
Logobou	Namponkore*	Logobou Area	6
	Kindikombou		6
			6
Partiaga	Foanboanli		6
Yonde	Ouobgo*		6
	Kondogo		6
Diapangou	Balga	Diapangou Area	6
			12
Botou	Botou*[a]		6
	Ougarou		6
Kantchari	Mantchangou*		6
	Moadagou		6
	Sambalgou		6
Ougarou	Poniokonli	Ougarou Area	6
	Gayeri		6
			6
Pama	Kpamkpaga		6
	Kpoali		6
	Soudigui		6
	Tindangou*		6
Total:	27		168

Source: 1979-80 Farm Survey.

*Denotes residences of enumerators.

[a]North of Fada.

The 1980 marketing survey was also conducted at marketplaces purposely selected on the basis of their importance in the zone or in the entire region (see Table 4.4). Enumerators attempted to interview producers as they finished their transactions with merchants. A producer who refused to be interviewed was replaced by the next available until 10 were interviewed if market attendance permitted. The purpose of this part of the 1980 marketing survey was to identify eventual differences of marketing behavior patterns between the heads of households of the 1979-80 farm survey and a more heterogenous group of producers (heads of households as well as other members of households) visiting markets at the same periods. To achieve that purpose the same basic questions (with slight modification to account for the fact that enumerators were strangers to market visitors) were asked to both groups.

4.3.3 The 1980 E-ORD Village Inventory Survey

This survey, conducted in April-May 1980, was designed to present simple socioeconomic information which could help describe the basic level of economic development of all 644 E-ORD villages listed in the 1975 population census. The questionnaire was structured into five main categories: population and socio and economic infrastructure, water supplies education and health, grain marketing, processing industries, and other industries (see D. Wilcock, 1982). The type of information was either a physical count of some characteristics (population, trucks, etc.) or the existence/nonexistence of some trait. Questions were asked to a group of knowledgeable villagers (usually the village chief and other leaders) forewarned of the arrival of the interviewers (the local extension agents usually accompanied by one or several members of the MSU-team).

Table 4.4

Sample of Markets and Producers Surveyed
in the 1980 Marketing Survey

Sectors of of E-ORD	Marketplaces	Number of Farmers Interviewed	Number of Villages Farmers Came From
Bogande	Diaka	32	7
	Manni	32	9
	Piela	33	10
	Diapaga		
Diapaga	Logoubou	40	5
	Nadiabonli	16	8
	Namounou	42	15
	Naponsiga		
Comin-Yanga	Bousgou	2	2
Fada	Fada	2	2
	Bilan-Yanga	33	15
	Diapangou	36	11
	Ougarou[a]	34	17
	Tentiaka	26	7
Kantchari	Kantchari	10	7
Matiacoali	Matiacoali	27	6
	Nassougou	9	2
	Boulgou	17	3
Pama	Pognoa	5	3
	Tindangou	8	4
Total:		463	144[b]

Source: 1980 Marketing Survey.

[a]North of Fada.

[b]Combined figures for all markets.

The relevant marketing information of this 1980 E-ORD village inventory survey concerns:

- whether the village has a marketplace;
- whether merchants visited the village to buy millet-sorghum;
- whether OFNACER had bought grain;
- how much sorghum and millet (in 100 kg bags) left the village;
- the price of one 100 kg bag at harvest;
- whether there existed a colonial silo[8] in the village and if it existed, whether it was used.

4.3.4 Data Limitations

The many sources of information referred to above provide a large data base, but in many respects they also present some limitations that will be addressed in detail in the next chapters. The following comments, therefore, serve only as an overview.

The data in the 1978-79 farm survey is a single-year cross-section set and, thus, presents limitations as to the representativeness of the producer's behavior that can be derived. (The 1980 farm and marketing surveys have been gathered in an even more reduced time period, since it was conducted from February to June.) In addition, the fact that the unit of analysis is the household or farm-family unit introduces some bias. This is because the head of the household, obviously, may have a good recall of what he did, but his recollection of other members'

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[8]Concrete silos of various sizes were built by the French colonial power around WW II to hold the supplies of the Sociétés de Prévogance which purpose was to purchase, store, and sell cereals to rural and urban populations. This local level grain stabilization practiced through forced cereals collection had since been ended and most silos had remained idle. (Personal communication--see also E. Tapsoba, 1981, p. 49; and D. Wilcock, 1977, p. 200).

activities could be less sharp. (This fact was not an oversight of the survey design. Rather, it was imposed upon the design by the fact that other members of the household, especially women, were reluctant to answer questions without the approval of the head of household.)

Another limitation of the data is that the 1978-79 farm survey provides an imperfect coverage of both the marketing seasons of 1977-78 and that of 1978-79, although it covers a full 12-month production season. Such partial coverage of the marketing season prevents one from following the disposals of farm crops from one harvest to the next and complicates further the analysis. (A detailed discussion of the 1978-79 farm survey coverage and its implications are provided in Chapter 6.)

A further shortcoming of the data used in this study is that households may have a better recall of the value of transactions compared to the recall of the volume of transactions. The fact that containers, in which volume of transactions were reported, are not standardized introduces an added difficulty. In the absence of actual measurement of volume, the kg conversion used serves only as an approximation.

As for private traders in the E-ORD, most are illiterate and none keep regular records of transactions. Besides, their mistrust of public officials, justified by repeated government attempts to reduce their activities, is not conducive to the sharing of precise information about their transactions. But the fact that the marketing investigation attempted to cover the entire E-ORD, instead of zeroing in on a few marketplaces and merchants, was also responsible for the lack of more detailed information on traders. In fairness to the design, however, the focus of the marketing survey was still put upon farmers, as was the 1978-79 farm survey.

The above limitations are not atypical of many other studies conducted in developing countries. E. Berg (1977, p. 2) reminds us that wherever possible, numbers generated under these conditions "should not be used as point estimates--simple numbers--but rather as range estimates, however inconvenient that is.... And conclusions about reality which rest on these data should be expressed in the most tentative of terms." This study pays heed to Berg's warning.

4.4 Summary

The E-ORD is a large geographic area with contrasted climatic and population distributions. The ORD is given an extensive economic development mandate, but concentrates mainly on agricultural extension. OFNACER regional office, the CRG, is the other main relevant institution. The Eastern region has been neglected for years and its poor socioeconomic infrastructure (e.g., roads) is reflective of this fact.

The information on which this study is based has several sources: (1) the 1978-79 farm survey; (2) the 1980 marketing information; and (3) the 1980 village inventory survey. The data set is rich because of its large base and detail, especially in the 1978-79 farm survey. It still suffers, however, many limitations, for it is only a single-production year cross-section data set, the unit of analysis is different from the unit of inquiry, values and volumes of transactions might have recorded with different levels of accuracy, and in many aspects, the information on grain merchants is not as detailed as that on farmers.

CHAPTER 5

SORGHUM-MILLET MARKETING CHANNELS AND PROCESSES

5.1 Introduction

The focus of this chapter is on the identification and characterization of grain marketing intermediaries, the description of the marketing channels and standard operating procedures, and the diagnosis of some marketing problems at the overall system level.

Whereas economists' reference to the market is with respect primarily to a pattern of exchange and then the physical location where this exchange takes place, geographers and regional scientists have long sought to gain understanding of the development process by emphasizing a central place theory approach which focuses attention on the spatial characteristics of marketplaces. With regard to developing countries, many regional scientists have hypothesized that markets and their eventual periodicities are set up in order to minimize travel costs of itinerant traders (see R.H.T. Smith's review, 1978, pp. 11-25). In turn, neoclassical structure-conduct-performance studies measure correlation coefficients between market prices to make inferences about market integration. The underlying assumption of both regional economists and structuralist S-C-P researchers is that all transactions take place in the physical marketplace, or that prices reported in these marketplaces are representative of transactions taking place elsewhere.

But all transactions are not conducted in marketplaces. In house trading (P. Hill, 1969), food grain is purchased or bartered directly between village consumers and village producers. In another arrangement, sometimes called "periodic trade without periodic marketplaces" (R.H.T. Smith, 1978, p. 18), food grain is sold by producers to middlemen at the farm gate, and exported from there to other regions. What happens then is that a very small volume may actually reach the marketplaces of the exporting region, which, coupled with the imperfect knowledge of participants, may lead to "thin" market conditions where prices are more volatile than otherwise because they are no longer representative of the overall supply and demand conditions. Another consequence of the smaller volume passing through marketplaces is that checkpoints established at markets to measure region-wide grain flows will yield underestimated results. These alternative market channels may present other special characteristics and problems that should be investigated along with those of the more traditional marketplace-oriented trade.

Thus, even though this study focuses major attention on grain producers in the E-ORD, a treatment of the grain marketing channels and processes is an essential backdrop to the understanding of the marketing behavior of grain producers in the E-ORD. Furthermore, recommendations to correct malfunctions of the marketing system should be based on all relevant information about the present system. These recommendations are essentially geared at shaping the behavior of the market participants in ways consistent with overall system objectives. Thus, it is important to try to uncover the major participants' standard operating procedures (SOP) and assess how these SOPs might be related to some of the marketing problems.

The sources of information used are the 1980 marketing investigation (see Chapter 4). These sources are varied, but an important part is made up of the open-ended interviews with knowledgeable merchants and agents at Namounou, Piela, Fada, Bassieri, Pama, and Bilan-Yanga. The major limitations of the information gathered are the lack of market price series and volumes of transactions. These limitations, which are explained by the difficulties of data gathering as well as by the marketing characteristics of the region, prevent us from testing hypotheses related to market price volatility and addressing a broad set of system-wide problems.

Instead, the balance of the chapter addresses the following, restricted, but still important points:

(1) characteristics of marketplaces in E-ORD;

(2) typology of major grain marketing participants;

(3) major private and public marketing channels;

(4) standard operating procedures of participants;

(5) illustration of private traders' costs.

5.2 Marketplaces in Eastern Upper Volta[1]

5.2.1 Number and Periodicity

The 1980 village inventory survey identified 178[2] markets among 635 villages;[3] that is, on the whole, two markets for seven villages. It

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[1]Section 5.2 relies heavily on A. Mehretu's report based on the 1980 village inventory survey (1982, pp. 73-83). The author helped design the marketing component of this 1980 village inventory survey.

[2]A previous count by the Ministry of the Interior (December 1976) found only 103 markets.

[3]The 1975 census identified 644 villages, a few of which were temporary rainy season settlements (campements de culture). A few other villages were overlooked by the population census.

would appear that the existence of a market is strongly related to the population and size of the village and that rural market distribution follows the scattered pattern of the population distribution. Pama and Bogande, however, present two exceptional cases. In these administrative centers, there is no agricultural produce market even though a few hawkers sell a small line of consumer goods (soaps, imported or locally manufactured packaged food products, etc.).

Markets in Upper Volta follow four types of periodicity (see the Ministry of Interior, 1976, Report, "Les Marches de Haute-Volta): (1) daily; (2) once every three days; (3) once every five days; and (4) weekly. In Eastern Upper Volta, markets are of types 1, 2, or 4, but daily markets are not very common (see Table 5.1). These daily markets occur only in important centers and usually still have a longer periodicity (three days or weekly) on which days market activities are more important.

The empirical data presented in Table 5.1 and the population density in Map 4.3 seem to support the hypothesis that the denser the population and shorter the distance between centers, the shorter the periodicity of markets. For example, the periodicity of markets is of the three-day type in the densely populated areas of the West (Comin-Yanga, Diabo, and Fada), whereas, the periodicity is of the once a week type in the areas of low population and village density of the East (Matiacoali, Diapaga).

An alternative explanation of this pattern (or at least part of it) is that market periodicity is related to the social traditions rather than the population density in Eastern Upper Volta. Market services are mostly performed by nonGourmantches because, traditionally, the

Table 5.1

Market Periodicity: Percent of Village Markets
With Varying Periodicity in Each Sector

Market Frequency	ORD Sectors								ORD Total
	Bogande	Diabo	Diapaga	Comin-Yanga	Fada-N'Gourma	Kantchari	Matiacoali	Pama	
Everyday[a]	3.4	4.8	5.3	0.0	3.6	0.0	0.0	0.0	2.8
Every Three Days	91.5	90.5	0.0	100.0	92.9	8.3	33.3	71.4	70.6
Once a Week	5.1	4.8[b]	94.7	0.0	3.6	91.7	66.7	28.6	26.6

Source: 1980 Village Inventory Survey. A. Mehretu, 1982.

[a]Most daily markets still keep a longer periodicity. Alternatively, in large periodic markets a few consumer goods, packaged food, and wares are still made available everyday.

[b]Not classified.

Note: Some totals do not add up to 100 because of rounding errors.

Table 5.2

Rural Markets in the Eastern Region That Serve More Than Five Villages

Rank[a]	Location of Market	Village Population	Number of User Villages	Mean Market Radius (Crude) km	Mean Market Radius (Weighted)[b] km	Rank[c]
1	Fada	13,067	190	41.5	43.9	1
2	Kohogo	3,041	10	38.9	21.7	5
3	Diapaga	5,617	23	35.2	30.1	2
4	Namounou	5,048	35	31.3	17.1	10
5	Botou	1,839	16	27.3	21.7	5
6	Bilanga Yanga	1,573	32	23.3	23.5	4
7	Bogande	4,351	47	23.0	18.2	8
8	Namoungou	837	10	22.3	15.8	13
9	Kantchari	2,883	22	21.7	17.1	10
10	Pama	2,265	4	19.7	9.9	18
11	Dzembende	1,472	23	18.7	15.7	14
12	Boulgou	1,116	8	16.1	26.2	3
13	Matiacoali	2,683	12	15.6	16.1	11
14	Comin Yanga	3,603	9	15.0	7.7	20
15	Piela	3,974	53	14.6	17.6	9
16	Manni	2,212	43	12.9	12.0	15
17	Tibga	3,004	21	12.9	11.3	16
18	Bassieri	1,324	7	12.8	19.0	7
19	Ougarou	547	6	11.3	8.6	19
20	Tiantiaka	940	13	11.0	6.8	23
21	Yamba	1,399	12	10.9	15.9	12
22	Boussirabougou	695	17	10.1	7.2	21
23	Diabo	1,277	54	14.9	20.1	6
24	Karkouri	105	7	8.0	6.9	22
25	Diapangou	1,249	18	7.6	10.6	17
26	Diaka	1,488	17	6.2	4.6	25
27	Pori Gourma	1,201	8	6.1	6.3	24

Source: 1980 Village Inventory Survey, A. Mehretu (1982).

[a]Based on crude mean of market radius in km (Eucledian distance in km from market to user villages).

[b]Computed as follows:

$$\bar{d}_i = \frac{\Sigma[d_{ij} \cdot P_j]}{\Sigma P_j}$$

where, $\bar{d}_j$ = weighted mean market radius for market i;
d_{ij} = Eucledian distance from market i to user village j;
P_j = population of user village j.

"The weighted market radius (distance to user village) is considered a better and more reliable estimate of market shed because it takes into consideration the sizes of the user villages." (A. Mehretu, 1982, p. 78).

[c]Based on (b) above.

Table 5.3

Distribution of Village Markets in the Eastern Region by Mean Radius of Market Area

	Type of Market[a]	Mean Market Radius[c] km	Number of Markets Based on Crude Distance[d]	Number of Markets Based on Weighted Distance[d]	Total Number of User Villages
1.	Regional Center	40+	1	1	190
2.	Regional Markets	30-39	3	1	68
3.	Subregional Markets	20-29	6	5	131
4.	Area Markets	10-19	17	13	278
5.	Local Markets	<10	35	42	121
6.	Village Markets[b]	--	116	116	116
	Total:	--	178	178	--

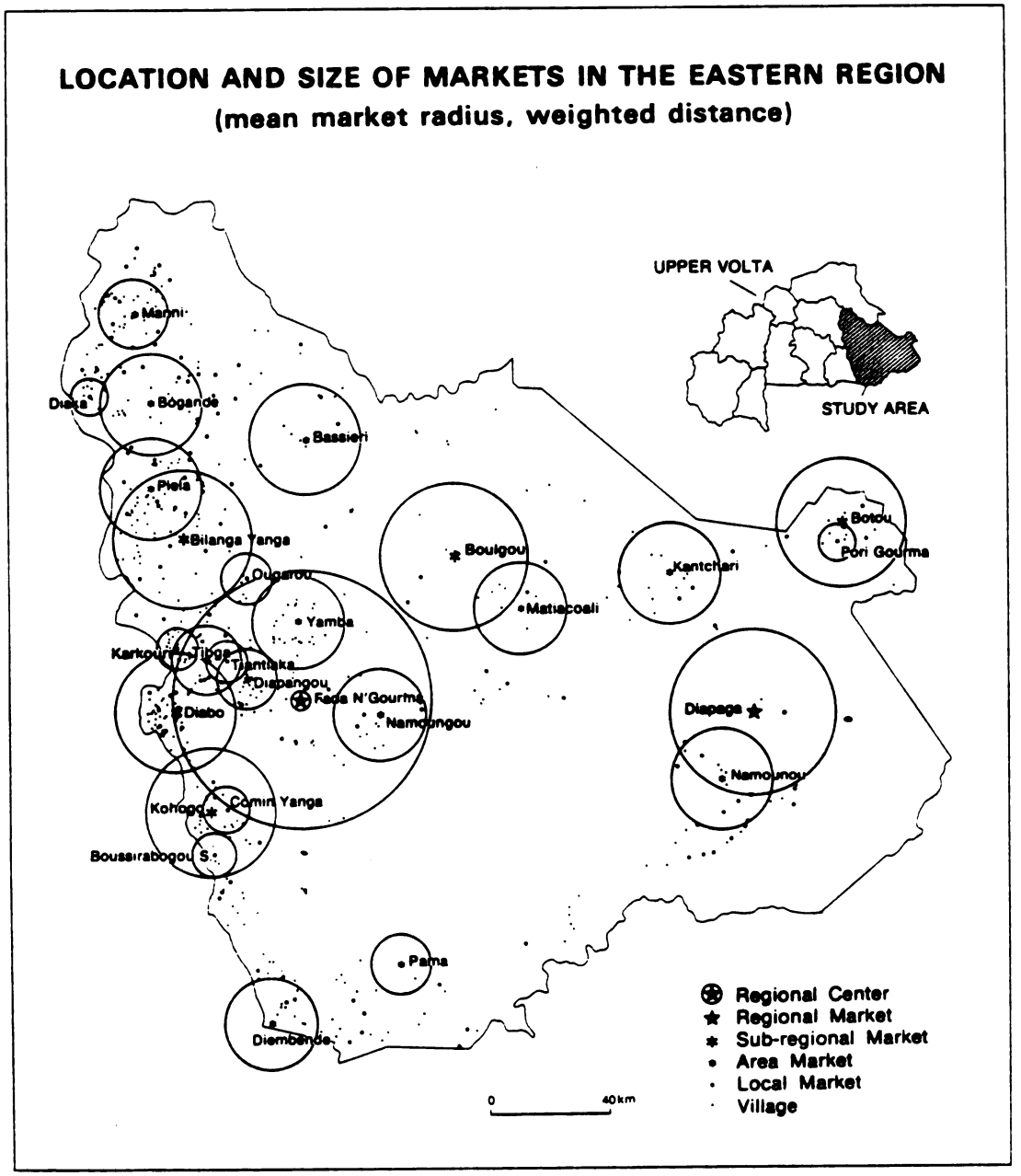
Source: 1980 Village Inventory Survey, A. Mehretu (1982).

[a]The first four categories of market service five or more user villages. Local markets service between two and four villages.

[b]These are village markets which do not serve other villages besides their own.

[c]Eucledian distance in km from market to user village.

[d]See computation in Table 5.2.



Source: A. Mehretu (1982).

Figure 5.1

Location and Size of Markets in the Eastern Region

information into the location and size of markets in the Eastern region.

It appears that more than 65 percent of the rural marketplaces do not serve villages other than their own. The lingering impression from an observer of the physical appearance of these local markets and some area markets is their small dimension. In many of these markets, the stalls are simply made up of a straw roof supported by a few wooden poles, open from all sides. Actually, a great number of these village markets are almost completely shut down physically during the rainy season.[8] The latter observation is supported by the fact that the staples millet and sorghum are available during the hungry season when stocks are low in only 33.1 percent[9] of all markets (A. Mehretu, 1982). Thus, the fact that 28 percent of the villages have markets (178 markets for 635 villages) is a misleading indicator of the importance of markets in the region.

The assessment of the importance of rural markets in Tables 5.2, 5.3, and Map 5.1 is on the basis of villagers' attraction to markets. Marketplaces attract local residents because of the exchange in agricultural products, but also because of other central place characteristics of these markets. To illustrate, in addition to agricultural products, manufactured goods (consumer goods, hardware, kitchenware,

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[8]Market facilities are shut down in the rainy season because of transportation difficulties and also because time for market visits competes with agricultural activities. Exchange then takes place among households. However, in his compound, the local trader may still sell some grain to local residents.

[9]This figure is computed as the percent of the number of markets where sorghum and millet are available in the rainy season to the total number of markets (178) in the E-ORD.

Gourtmantche have despised these activities.[4] Two other most dominant groups perform market services in the region: The Mossi are numerous in the West, and the Haoussa are numerous in the East at the border with Niger where many come from. It would appear that the Mossi have imposed their three-day market frequency in the populated area of the West, whereas, the Haoussa have imposed their weekly market frequency in the sparsely populated parts of the Center and East where their influence is mostly felt.[5]

5.2.2 Location and Size of Marketplaces

On the basis of the results of the 1980 village inventory survey, Table 5.2 identifies only 27 markets which serve more than five villages,[6] and ranks them according to the distance[7] from the marketplace to the user villages. In addition, Table 5.3 stratifies all the 178 markets in six categories on the basis of the number of villages served and the mean market radius. Finally, Figure 5.1 translates this

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[4]Many actual Gourtmantche traders trace their origins to non-Gourtmanche background, from Mali notably (Jean Dahni, personal communication).

[5]As the legend goes, the Mossi Emperor's wives, who alledgedly set up the first regular market meetings in Ouagadougou, instituted the three-day market periodicity to coincide with the three-day brewing cycle of the popular sorghum beer (dolo). In the literature, it has been suggested that weekly market periodicity is often related to strong Muslim traditions. (Nearly all Haoussa in the East are Muslims, whereas, the religious beliefs of Mossi are more diversified and more tolerant to alcohol.)

[6]It was not determined for which particular reasons (to buy and/or sell agricultural or other products) residents in (user) villages attend the markets identified.

[7]Distance is mean Euclidian distance in kilometers from the market to user villages. In Table 5.2 this distance is referred to as market radius.

agricultural implements, clothes) are also exchanged and services (bicycle and auto repairs, grain milling, traditional and modern medicine services) are also provided in the regional center, regional and subregional markets. Also, Manni and Piela markets attract numerous market participants because market-goers can take advantage of available health care facilities provided almost gratis by religious institutions. Furthermore, many markets in categories 1, 2, and 3 (see Table 5.3) are also administrative centers (e.g., the E-ORD sectors centers), and only a few markets, for example Namoumou and Piela, have developed outside government-provided services.

The importance of rural markets with respect to grain marketing may not coincide with the assessment based on the more encompassing central place characteristics. Knowledgeable market participants and the author's own observations suggest a slightly different ranking of rural markets with respect to agricultural marketing (see Table 5.4). For example, Namounou is regarded by all participants as the most important produce market in the E-ORD on the basis of the volume of transactions and the number of participants attracted to the market. The fact that it is also the major market of smuggled manufactured products in the region adds to this importance. Another category of rural markets is the frontier markets at the borders of Togo and Benin (Pognoa, Zembede) which have their counterparts (with the same names) on the other side of the border.[10] Further information on the role of rural markets is provided later on in this chapter.

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[10]The ranking of Table 5.4 should not be viewed as inconsistent with that of Table 5.3 simply because the two differ. This difference is essentially due to the fact that the ranking of Table 5.3 is based implicitly on a broader criterion than grain marketing, the subject of the present study.

Table 5.4

Major Agricultural Produce Markets
in Eastern Upper Volta

1. Regional Center[a]	Namounou
2. Regional Markets	Fada, Piela, Diapaga
3. Subregional	Logobou, Nadiabondi, Mani, Diaka, Bilanyanga, Nassougou, Bassieri, Tansarga
4. Frontier Markets	Pognoa, Zembede

Source: 1980 marketing investigation.

[a]Pouytenga, located outside the E-ORD and 5 kilometers off the Fada-Ouagadougou highway, is an even larger rural market, and plays an even more important role than Namounou. Actually, Pouytenga is regarded as the largest rural market in Upper Volta. It happens that it is also the largest smuggling market in the country.

5.3 Typology of Major Market Participants

There are many ways to categorize rural market participants. In many cases in Africa, sharply delineated definitions such as "wholesalers" and "retailers" are not operational research concepts because many intermediaries perform all of these and sometimes other functions (see also, H.M. Hays, 1975; and N. Ejiga, 1977). Here, we categorize the major middlemen on the basis of the following criteria:

(1) Title to the product or ownership of capital. The intermediary may own the grain he buys or he may do so on behalf of a third person. This category distinguishes between the independent trader (merchant middleman) and the dependent trader (agent middleman).

(2) Remuneration of the agent middleman. The dependent trader may work for an agreed upon commission, or he may be an employee or a sort of apprentice whose ultimate remuneration is a share in the patron's enterprise or a grant to start his own business.

(3) Trading range. Merchants may trade at only the village level, the canton level, the ORD level, or across several ORDs.

On the basis of these criteria, we distinguish six main categories of middlemen operating in grain marketing channels in the Eastern region.[11]

5.3.1 The National Wholesaler-Retailer (NWR)

This is a merchant middleman with a large capital base, located outside the ORD in the large national market centers (Pouytenga, Ouagadougou, Koupela, Boulsa, and Kaya) and who trades across several ORDs. Most of the NWRs are Mossi. Many of those large traders own their own trucks and transport purchased products which have been collected by a network of agents or bought from smaller traders in regional markets. They buy large quantities in the region, but may also sell large quantities, depending on supply and price conditions, at wholesale and/or retail in the markets they operate.

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[11]This typology, implicitly, reflects the fact that market channels are mostly set up to move products outside the E-ORD. As will be seen later, many of these participants have a much more reduced role in the backflow of grain in the E-ORD.

5.3.2 The Regional Wholesaler-Retailer (RWR)

This merchant middleman is similar to the NWR except that he is located within the ORD, at one of the larger regional rural markets or centers (Namounou, Fada, Piela, Diapaga) and has a trade basis in the region. Most RWRs are Gourtmantche or Haoussa and only a few RWRs own their own trucks. Furthermore, their network of agent middlemen differs from that of the NWR as will be seen later. The RWRs collect truckloads of grain that they sell outside the ORD and sell smaller quantities at retail in their principle business locations.

NWRs and RWRs are also active in the marketing of crops other than grain. They are often licensed (agrées) by the GOUV to buy export crops (peanuts, sesame, shea nuts) and sell them to the export crop marketing board (Caisse de Stabilisation) and CITEC (nationalized oilseed plant). Furthermore, many of the RWRs have made substantial profits in cattle trading from the ORD to coastal countries (Togo, Benin, and Nigeria). Finally, some own other businesses such as grain mills, consumer goods stores, and bars.

5.3.3 The Local Independent Trader (LIT)

This is a merchant middleman with a small trading capital base who operates over a small range of a few markets and villages. He is often based in the larger markets of the ORD, but many come also from outside the region (adjacent ORDs of Kaya in the North, and Koupela in the West). These traders do not own trucks, but some may possess donkey carts, and almost all make use of bicycles or motorbikes when it comes to transporting small quantities of grain. The average LIT is also engaged in some consumer goods retailing, but, and more so than most RWRs, may also be a farmer who produces grain for his own needs.

5.3.4 The Trader's Apprentice (TA)

The TA is generally not a salaried employee, but rather an apprentice in the merchant middleman's enterprise. Oftentimes, the two are related and may live in the same compound. These relationships are reflected in the fact that the apprentice's remuneration is usually not a straightforward commission based on volume, but something which includes living expenses, a reward based on the success of a given trading period, and ultimately anticipated rewards such as a partnership or the capital needed to start his own business. NWR, RWR, and LIT have apprentices who buy grain in outlying villages on their behalf during the marketing season, and return to help in retailing grain and consumer goods in the market centers.

5.3.5 The Commission Agent (CA)

Similar to the trader's aide, the commission agent does not take title to grain, but purchases for others at the village level. What distinguishes the CA from the TA is that he does business on behalf of a merchant middleman for fixed commissions. Furthermore, the CA's interaction with his employer lasts a shorter time than that of the TA (particularly if the employer is outside the ORD, in Ouagadougou for example) and occurs during the buying season. The CA is often a farmer himself, and/or he may also be a craftsman in one of the villages in a producing area. Another difference between the two is that the CA works at the village level, whereas the TA works at both the village level and in regional marketplaces. Finally, the CA tends to work almost exclusively with outside traders (NWRs).

The CA is active in his home village, but also in surrounding villages. He may also operate in distant villages in which he relies on

village resident buyers (VRB). Both the CA and the TA perform the important function of gathering information for their employers.

5.3.6 The Village Resident Buyer (VRB)

The VRB is also an agent middleman who buys grain on behalf of a third party and is paid on commission. His distinguishing feature is that he operates in one village only. The most common picture of the VRB is a village chief, or some other prominent figure in the village hierarchy to whom farmers are willing to sell their produce once he announces that he is buying. In effect, the VRB lends his social influence to an outside middleman and gets remunerated. But the VRB is provided with less capital than the other commission agents, and he tends to work more with grain merchants located in the E-ORD.

In a village, there may be households that provide accommodations for outside traders who want to stay a few days in order to conduct business. The room given to the trader also serves as a storage room for the grain bought. Although the villager host (called a logeur or a landlord) may influence producers to come and sell grain to the trader, he is not paid a commission. Rather, he is given gifts, oftentimes in kind, as a reward. OFNACER also uses this system, but agents pay the logeur for providing and/or watching the storage facility.

The preceding paragraphs have described the major middlemen in the traditional grain marketing system (see Table 5.5). There are other categories of participants in the total grain system that we should also mention. One is OFNACER which buys grain through its buying agents, has modern warehouses in Fada, and sells grain mostly to civil servants in Fada and other cities. Another is the ORD village group with a village cereal bank which is analyzed later. Futhrermore, food processors,

Table 5.5

Criteria of Categorization and Types of Major Middlemen

Types of Middlemen	Capital/Title to Grain	Remuneration	Location	Trading Range
National Wholesaler-Retailer (NWR)	Large Base	Profit	Outside E. ORD.	Long range across several ORDs.
Regional Wholesaler-Retailer (RWR)	Large Base	Profit	Within E. ORD in large markets/ central places.	Long range over E. ORD.
Local Independent Trader (LIT)	Small Base	Profit	Within or outside E. ORD in markets.	Small range of a few markets and villages.
Trader's Apprentice (TA)	No Capital (No title to grain)	"Salary" and Others	Within or outside E. ORD in markets.	Small range of a few markets and villages.
Commission Agent (CA)	No Capital (No title to grain)	Commission Fee	Within E. ORD in villages or markets.	Small range of a few villages.
Village Resident Buyer[a] (VRB)	No Capital (No title to grain)	Commission Fee or Gratification	Within E. ORD in village.	Restricted range of one village.

Source: 1980 marketing investigation.

[a]The landlord (logeur) is similar to the VRB. However, the first acts only as a go-between, and is not paid a commission. In addition, he doesn't handle money or grain.

mostly women, who buy grain for the purpose of preparing and selling traditional beer and food, play an important role, particularly in local grain transactions. Finally, there are transporters, such as truck, donkey, and donkey cart owners.

As already noted, many of the NWRs and some RWRs own their trucks (commercant-transporteurs) which transport passengers as well as grain, but there are also private truck transporters who have regular lines or provide their services on demand. Besides these options, many traders make use of government-owned trucks with or without the knowledge of the state organizations. There also are a few donkey owners in the Namounou area who engage in transporting grain, but most donkey cart owners are primarily in the ubsiness of transporting firewood which pays more than transporting grain for a third party. (Revenues from donkey carts can be a relatively important source of income for ANTRAC farmers. See Barrett, et al., 1981.)

5.4 Grain Marketing Channels in E-ORD

Marketing channels may be viewed in terms of the many alternative combinations of market intermediaries who participate in, or facilitate, the change in title of products from producers to consumers. They may also be viewed in terms of the physical movement of grain (assembly and bulking centers, transport routes, storage). The description of the major marketing channels that follows is mainly in terms of the coordination among the major marketing institutions. For lack of quantitative estimates, the treatment of the physical distribution will be less detailed.

There are two major types of institutional grain distribution systems in the Eastern region. One type involves the public institutions,

while the other does not and is referred to as the "traditional" system. The traditional marketing system involves private traders' participation, but also has direct house trading among village households. As will be seen later, there are some links, if only minimal, between private and public intermediaries. Another interesting feature of the E-ORD grain marketing system is that transactions involving public and private intermediaries may be a market-oriented trade or a farm gate-oriented trade.[12] In addition to these institutions, there is the village cereal bank which is operated by the precooperative village groups (groupements villageois) and the ORD. The importance of the village cereal banks will be analyzed in Chapter 7.

5.4.1 Traditional Grain Marketing System

5.4.1.1 Marketplace-Oriented Trade

Figure 5.2 is a summary flow chart showing possible distribution channels with marketplace-oriented trade in the traditional system. Producers may also be retailers or consumers; for some go to these markets to sell, others to retail, and still others to buy grain. The middlemen are either located in these markets or come from other centers. The double-headed arrows linking various participants denote possible reverse flows of grain which will be discussed later.

The main distribution channels in the Eastern region are the following:

(1) Producer/Retailer - Consumer. This direct exchange is a local trade which redistributes local grain surpluses in small

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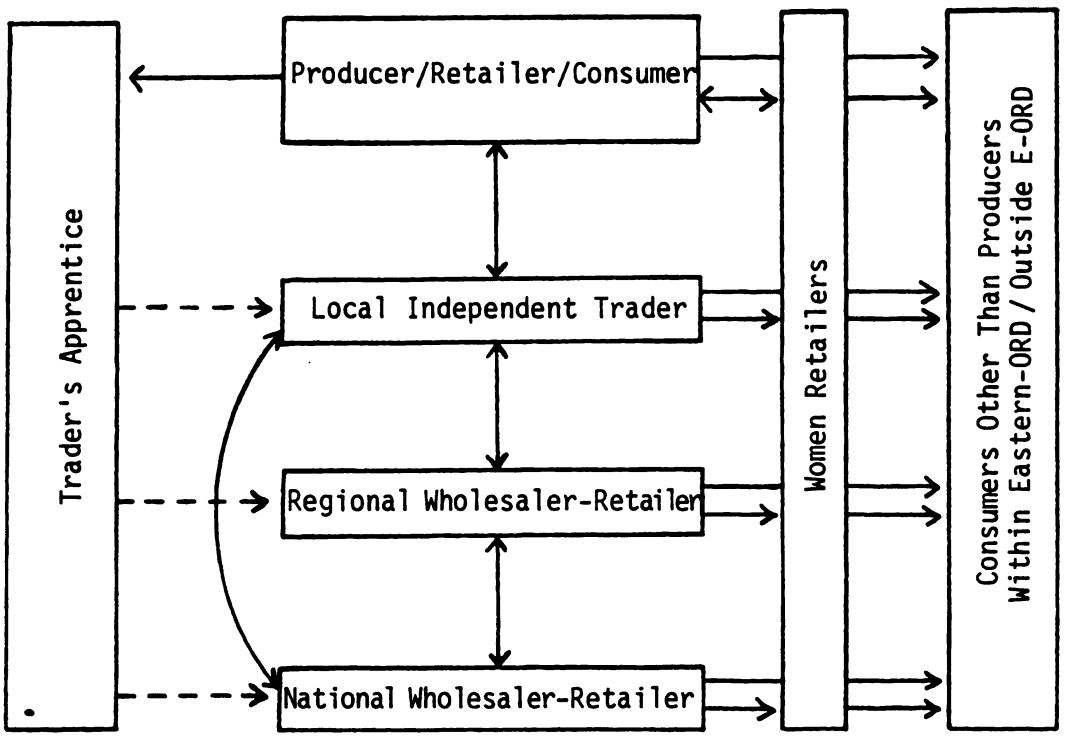
[12] It is worthy of note that although house trading occurs also outside marketplaces, it involves mainly transactions between producers and final consumers located in the same or neighboring villages.



⟶ Denotes one-directional flow.

- - -→ Denotes one-directional flow and internal flow to merchant middleman's business.

⟷ Denotes two-directional flow.

Figure 5.2

Traditional Grain Distribution Channels in Marketplace-Oriented Trade

quantities. In general, both participants are female, and it is often difficult to determine whether the seller is retailing her own (or her husband's) grain, or if she is retailing grain previously acquired from other participants. In the latter case, these other participants are producers or merchants, but consequently the channel is no longer direct.

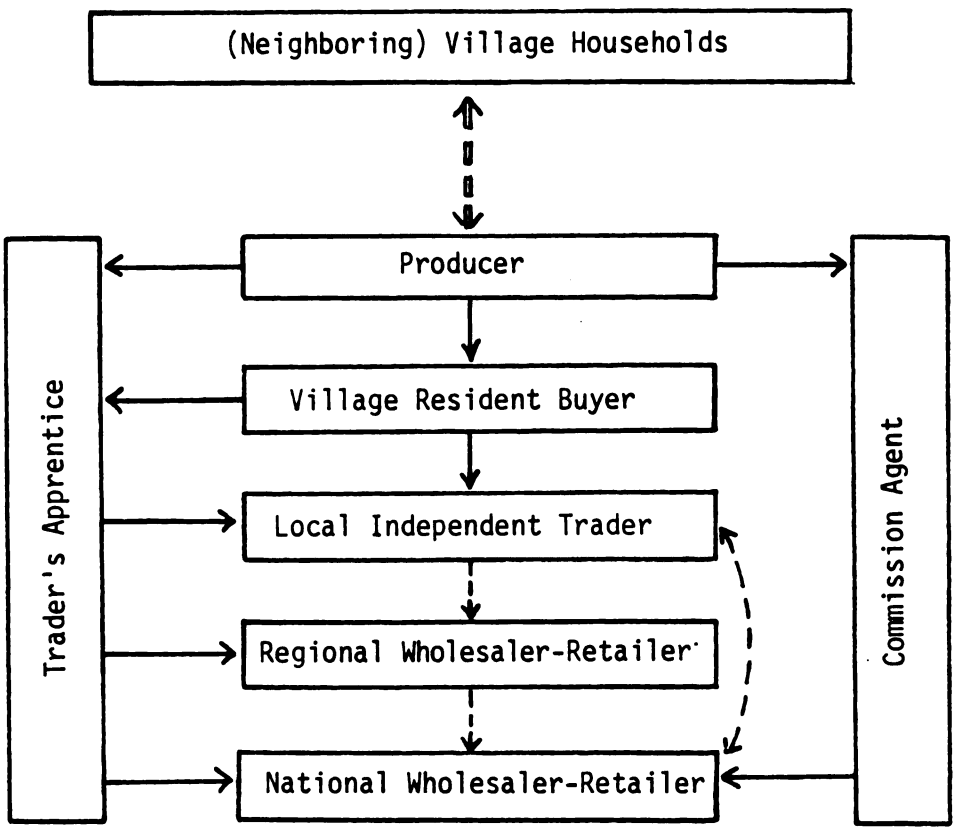
(2) Producer - LIT - Consumer. In this channel, the local independent trader assembles grain for retail in other markets or in the same market later in the year during the "hungry season."

(3) Producer - LIT - RWR or NWR - Consumer. In this channel, grain collected by the smaller merchants (LITs) is sold in the same or next larger market to larger merchants (RWRs and NWRs). The RWR retails the grain in his business location which is within the E-ORD, while the NWR located outside the E-ORD retails the grain to consumers outside the E-ORD. This is an important channel linking rural and urban areas.

(4) Producer - LIT - RWR - NWR - Women Retailer - Consumer. This represents the longest major marketing channel which moves the grain outside the E-ORD to consumers in other parts of Upper Volta.

5.4.1.2 Farm Gate-Oriented Trade

In the Eastern region, grain assembly by private intermediaries occurs not only at market sites, but also at the farm gate. Figure 5.3 illustrates this farm gate-oriented grain assembly while also showing



⇦▫⇨ Denotes house trading (outside marketplaces).

⟶ Denotes grain assembly at the farm gate (outside marketplaces).

- - → Denotes possible transactions between merchants in marketplaces.

Figure 5.3

Traditional Marketing System Showing House Trading, Assembly at the Farm Gate, and Merchants' Transactions in Marketplaces

the house trade and possible transactions which may later take place in market centers between merchant middlemen. For clarity, the transactions in marketplaces, between middlemen, and consumers are not shown.

The following are the major types of transactional channels:

(1) Producer - Village Households. This direct channel has farmers selling to consumers in the village. These consumers may be other producers, craftsmen, or fulani herders. This is part of the "hidden trade" or "household trade" as reported in marketing literature. In addition, exchange involving producers and other participants may include barter transactions such as gifts, credit, etc.

(2) Producer - Commission Agents - NWR. Commission agents are used mostly by the large outside traders (NNWRs) who do not have a reliable network of village resident buyers. Even though we have not shown a link between commission agent and village resident buyers, this link may exist, but a CA will use VRBs only if the volume requested by the NWR is very large.

(3) Producer - LIT. Here we note that the local independent trader who goes directly to producers in the village to buy crops. He may also go through a village resident buyer (VRB).

(4) Producer - Trader's Apprentice - Merchant Middlemen (LIT or RWR or NWR). Trader's aides here are doing the buying just as the buying just as the LIT, but they do so on behalf of a merchant middleman who may happen to be a LIT, a RWR, or a NWR.

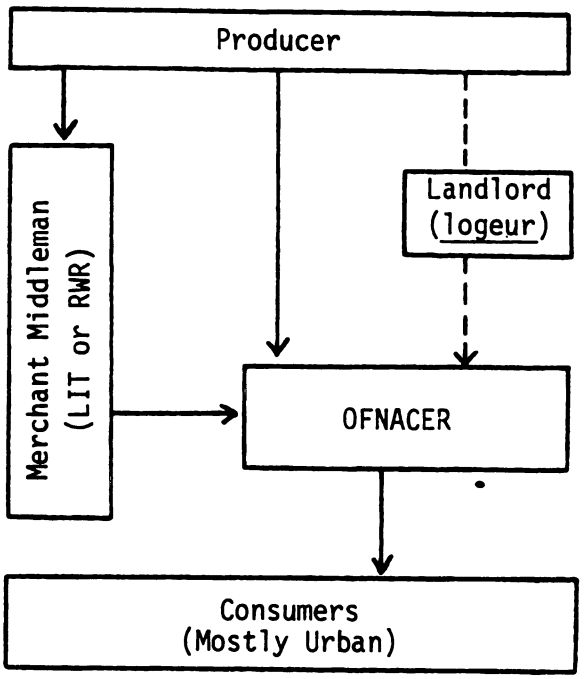
(5) Producer - VRB - TA - Merchant Middlemen. Merchant middlemen often send their apprentices to VRBs when the area over which they want to collect the product is large, and/or when they do not have enough apprentices, but they have confidence in several VRBs.

5.4.2 State Marketing Channel

In this section, we describe the structure of OFNACER (CRG of E-ORD) buying organization. OFNACER headquarter in Ouagadougou every year decides on the number of buying agents to send to the Eastern region who will be directed by the OFNACER regional chief (Chef de CRG). In the 1979-80 buying campaign, OFNACER employed nine buying agents in the Eastern region to operate in the marketplaces and also directly at the village level. They buy products (millet, sorghum, cowpeas, and paddy rice) directly from producers at marketplaces and at the farm gate, and they also buy from traders. In view of our categorization of the participants, the marketing structure of OFNACER is as follows (see also Figure 5.4):

(1) At the village level, OFNACER agents buy directly from producers at preannounced times and places. The buying points are generally the compounds of the village chiefs in one of which the agent usually resides. The village chief plays the role of a landlord (logeur) who is paid a rent for the agent's housing and an amount of money based on the number of bags and days of storage.

(2) When the AFNACER agent operates in the marketplace, he usually purchases large quantities from the merchant middlemen who are willing to assemble and bag the small



——→ At the marketplace.

– – → At the village level.

Figure 5.4

OFNACER Marketing Channel

quantities sold by numerous producers. In most instances, the trader buys the grain at the market, bags it using OFNACER's bags, and sells it right away to OFNACER. In other cases, the trader may rely on his connections in villages to organize grain assembly and transportation to the OFNACER market buying point. In contrast, OFNACER purchases from producers at the marketplaces are not very important.

5.4.3 "Back Flow" of Grain

The preceding presentation of the grain market channels is typical of the unidirectional presentation of the flow of agricultural produce from producers to rural and urban consumers. Added to this picture should be the sequence of middlemen who interact to sell back food grain to rural producers/consumers. In particular, we are interested in the inflow of grain to rural areas through the channels under a normal production year and/or during the rainy or "hungry" season.

RWRs and LITs located in markets close enough to outside markets such as Pouytenga and Ouagadougou are known to go to the NWRs outside E-ORD to buy food crops. The RWRs may, in turn, sell the products to other LITs or retail it themselves in the large rural markets where they are located. However, the local independent trader (LIT) is the only intermediary with large volumes that comes in close contact with producers/consumers and other rural consumers in the village. [These possibilities are illustrated in Figures 5.2 and 5.3 by reverse (up) arrows.] The other intermediary is the small retailer whose trading range is severely limited in the rainy season.

The small proportion (33.1 percent) of rural markets where grain food is available during the hungry season indicates that many rural consumers are not well served by the network of rural markets during the rainy season. Unfortunately, the network of agent middlemen (TA, CA, and VRB) which teamed up to move out products from farmers is not operating to serve back producers/consumers. This is because once the buying campaign is over, TAs rejoin their respective traders in the larger marketplace, and CAs and VRBs go back to their own business of farming.

As for OFNACER, its distribution network usually covers urban cities only as indicated in Chapter 3. (In E-ORD, OFNACER's main food distribution outlet is in Fada.) Only in some instances of severe drought does OFNACER organize interant selling points of food imports. Unfortunately, these selling points are set up in the main regional centers (where most civil servants are reached) and food is sold directly to consumers.

Thus, whereas there are important market channels that remove grain from the region through markets as well as through exchange arrangements which operate outside marketplaces, only in important rural markets in the rainy season is grain available to rural consumers through market intermediaries. In all other instances, producers/consumers and other rural residents must have accumulated grain stocks or buy grain from fellow grain producers. (In a few cases when the market is shut down during the rainy season, a local trader may still sell from his compound.) But if grain harvest happens to be disastrous for all producers in the area, food shortages may be severe.

5.4.4 Major Grain Physical Movements in E-ORD

Even though quantitative estimates of the total grain handled by market participants are lacking, the following account still provides a good summary of the physical grain movement in the E-ORD based on our present knowledge of the grain marketing system. Four main movements that take grain out of the E-ORD have been identified:

(1) The movement which extracts grain from the Namounou-Diapaga-Logobou area to the large market and consumer centers of Pouytenga, Ouagadougou, and Fada, through the main Diapaga-Kantchari-Fada Highway, is regarded by many knowledgeable merchants as the most important. This flow is fueled by added grain picked up along the road as trucks head back to Ouagadougou or Pouytenga on Sunday nights or Monday mornings following the Sunday market of Namounou.

(2) Along the West stretch of the E-ORD, grain flows from centers like Coalla, Manni, Diaka, Bila-Yanga, and Piela to the market and consumer centers of neighboring ORDs, Yalgo and Boulsa (Kaya ORD), Pouytenga and Koupela (Koupela ORD), It appears that such movement is more important than the flow along the second road network of the region (Bogande-Piela-Fada).

(3) An important part of the grain also flows to the neighboring countries of Togo, Benin, and Niger. Historically, the E-ORD had been considered a "food shed" for the neighboring countries of Niger, Benin, and Togo. Today, there is still a great deal of produce being exported to these countries (especially millet and cowpeas). Togo and Benin draw their

their supplies mainly through markets along the borders (particularly Zembende and Pognoa on the Togo border). These markets often have their counterparts or "twins" on the other side of the border, and transactions will involve Voltaic producers, foreign consumers, and small traders from both sides. The visible volume traded and exported may not be impressive in any market day, particularly if no large capacity trucks are present, but it may be quite important over the entire trading season. On the other hand, Niger draws its supplies deeper in the region because it has a longer border and better roads with the region than Togo and Benin.

(4) Finally, the direction of flow of grain from the center of the region is less distinct than in other parts because of the very poor road network. They branch either to the Piela-Pouytenga route or to the Namounou-Fada route.

In contrast with the numerous alternative grain export flows from the region, there is but one major route along which grain flows back into the E-ORD. This flow originates from Ouagadougou and Pouytenga, the very centers which imported grain from the E-ORD during the commercialization campaign. The path follows the main highway in the region and reaches Fada and Diapaga.

5.5 Standard Operating Procedures

This section examines key standard operating procedures involving agent middlemen, merchants, and producers.

5.5.1 Private Agent Network

At the large marketplaces (Namounou, Piela, Logobou, etc.) there is a keen competition, on the one hand, among small independent traders, traders' aides, and women restaurateurs, and on the other hand, between national and regional wholesaler-retailers. At these markets, some assemblers may be known well enough to attract a clientele of producers, but most assemblers pay children to guide uncommitted producers to them.

This practice of touting producers is taking a peculiar twist in the Fada area. In Fada, women restaurateurs do not wait for producers to come to the market. Instead, they meet them at key crossroads a few kilometers outside the marketplace. In addition, they also send their children on the smaller trails to intercept farmers on bicycle. The child usually attaches a distinctive piece of cloth to the bicycle to indicate to which woman the farmer will have to sell his/her grain. These transactions outside the Fada market have become so prevalent that almost no producer goes to the market of Fada for the purpose of selling grain (those who do, usually women, intend to retail rather than sell to middlemen). Women restaurateurs have come to rely on this scheme in order to avoid purchasing grain from merchants or paying double taxes (one for buying grain, another for selling food) when they buy grain at the market. Farmers, for their part, are content to avoid the inconvenience of the town (notably the police which may harass them for various reasons: nonpayment of head taxes, lack of identification, lack of proper fixtures on their bicycles, etc.). As a result of this practice, an assembly grain market may be developing outside the Fada market.

Buying grain at the marketplace is a time consuming task which yields disproportionally small results for any single assembler because

of the small quantities sold by a score of farmers and the small units of measurement used. In the small assembly markets, large merchants (RWRs and NWRs) may rely on their apprentices to collect grain, but in larger markets, the number of aides may be too small to take advantage of the available supply. Consequently, in the latter case, larger merchants contract with smaller ones (LITs) to supplement their needs. (To hire more aides is riskier because of potential cheating.)

An important feature of these contracts is that large merchants reluctantly provide credit to LITs to buy grain. Rather, they wait until the LITs have assembled a large enough volume to buy (usually at the end of the market day, but sometimes as the market activities go on). It has been reported that RWRs and NWRs fear that LITs (and occasionally the apprentices) may use their capital to buy grain and sell it to other merchants at more profitable prices to them. (When this happens, LITs and TAs usually pretend that market supply conditions were too poor.)[13] When the LITs do not receive credit from their larger contractors, they are free to strike a deal with anyone willing to buy grain, but at the same time, it substantially reduces their access to working capital.[14]

In the farm gate oriented trade, the village resident buyer (VRBs) and landlords (logeurs) play a central role. The VRB tries to convince other farmers to sell their grain to him, and thus saves the trader (RRW, LIT) the time it would have otherwise required to go from household to household. As previously mentioned, the VRB who takes an active part in

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[13] In the past, the E-ORD had also experienced such misfortunes with some village groups.

[14] Timely access to working capital is a major barrier to greater participation in grain marketing. As we will see, the easy access to large amounts of capital explains the appeal of the village cereal bank scheme.

handling grain and cash, is paid a commission, but the landlord who acts only as a go-between receives only some gratifications (usually gifts in kind). Sometimes, this handling of grain and cash by VRBs creates problems. The VRBs may not measure the grain the way the merchant might have, or the VRBs may cheat the trader out of his money the same way the NWRs fear the LITs do.

The standard operating procedures described above have emphasized the fact that cheating may exist to show how it may effect the system operation. Controlling the buying agent (bet it a VRB, a CA, or a TA) appears to be an overriding concern of the merchant. There is a trade-off between the cost of control (time and money costs of physical control) and the benefits of reduced money loss (because of cheating and inexperience). Merchants operating within their supply area can afford to give their agents small amounts of working capital (one-fourth or a fifth of the total at one time) and make more frequent control visits. In contrast, merchants located outside their supply area in the E-ORD, for example in Ouagadougou, have to provide their agent with larger operating funds and make control visits only a few times (no more than two).

As for the evolution of agricultural marketing in E-ORD, it was suggested by knowledgeable traders that more and more Gourmantches are entering the business and are challenging traders of other ethnic groups (Mossi and Haoussa) who have been dominant so far. The change may be due to inroads of Muslim and Protestant beliefs more tolerant to trade than traditional Gourmantche religious beliefs (most large and wealthy Gourmantche traders are either Muslim or Protestant). This rise of Gourmantche traders forces particularly Mossi traders from Ouagadougou

to rely more and more on LITs or commission agents who are part of the local communities in the E-ORD. (It should be noted that there is a large number of Mossi permanently established in the region and who are no longer considered strangers.)

5.5.2 OFNACER Agents' Operating Procedures

Table 5.6 shows the locations and characteristics of OFNACER's agents who purchased grain in the E-ORD during the 1979-1980 campaign. Most hardly understand the predominant local language (Gourmantche) and almost all have been in position late in the buying season. (In Bogande the agent was positioned in April to sell grain.) As for purchases, approximately half of the agents did their major purchases in villages (bypassing marketplaces) and half in the marketplaces of the village in which they were located.

Because the relevant performance criterion on the basis of which agents receive a bonus is the total volume collected, and because most agents are handicapped either by the language or their knowledge of local trade conditions, the agents rely on intermediaries to bulk the grain in order to reduce transaction costs when they are given the opportunity. At the marketplaces, the intermediary is a merchant[15] (licensed as well as nonlicensed), and at the village level, it is generally the village chief who plays the role of landlord (see Figure 5.4). In the latter case, producers are given empty 100 kg bags to fill and

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[15]Some agents provide capital to merchants to collect the grain; these merchants, who thus receive the credit that many LITs don't have access to, deliver the volume based on the official price and keep their profit. When market prices rise above official prices, they stop accepting the deal.

Table 5.6

OFNACER Agents' Network in 1979-1980

Residence of Agent	Major Purchases at	Language Capability[a]	Knowledge of the Area	Years as OFNACER Agent[b]	Beginning of Operations	Age of the Agent (Years)
Bogande	Villages[c]	Poor	Good	One Year	4/79	20
Diaka	Market	Poor	Poor	6 Months	12/1/79	29
Ougarou	Villages[d]	N.A.[e]	N.A.[e]	N.A.[e]	N.A.[e]	N.A.[e]
Diapaga	Market	Poor	Good	Over 3 Years	12/5/79	35
Namounou	Market	Poor	Good	Over 3 Years	12/1/79	22
Nadiabondi	Market	Excellent	Poor	Over 3 Years	11/30/79	27
Logobou	Market	Excellent	Good	Over 3 Years	12/1/79	24
Tansarga	Villages[d]	Poor	Poor	Over 3 Years	12/1/79	27
Madjoari	Villages[d]	Poor	Poor	Over 3 Years	11/27/79	48

Source: 1979-80 Market Investigation.

[a]Language capability is rated for Gourmantche. All agents, except in Ouagarou (N.A.) and Tansarga, speak at least a fair More, which many market participants understand.

[b]The actual training period, however, is only a few months, sometimes one.

[c]There is no grain assembly market in Bogande.

[d]There are markets in these localities, but most purchases are still conducted outside the markets. In Madjoari, no grain was purchased in the village market. Instead, producers went to the agents' residence to sell.

[e]N.A. = not available.

bring to the chief's compound. They are paid on prespecified days by the agents who go from bulking village to bulking village.

Two important results flow from these procedures. First, OFNACER itself is not encouraging the use of the official 20-liter container, the ORD tine. (In Chapter 7 we provide a detailed analysis of this issue.) At the large marketplaces, the producer who offers only small quantities is put off by OFNACER agents who prefer to buy in 100 kg bags from merchants. Furthermore, at the markets, the agent by contracting with assemblers let the merchant use his measurement device. In addition, in the villages selected in large supply areas, producers are provided empty 100 kg bags to fill.

Second, producers are effectively paid a different price according to whether they sell directly (in villages) or indirectly (at marketplaces) to OFNACER. Clearly, there is a competitive pressure on merchants brought about by OFNACER operating at marketplaces. Since in most instances OFNACER agents buy from licensed as well as nonlicensed traders, the demand for LITs' services increases and the supply of grain to large merchants competing with OFNACER decreases. Consequently, prices paid to producers at marketplaces are likely to increase as a result of OFNACER's presence. But, prices paid to producers at marketplaces by merchants must be lower than the official price because these merchants who are paid by OFNACER must cover their marketing costs and earn a profit. In addition, the net price received by farmers at marketplaces are even lower because the cost of transporting the grain from the village to the market.

When the ORD was actively involved in grain marketing, it attempted to set up a fairly sophisticated, but ultimately unsuccessful agent

network at the village level (see Chapter 3). Currently, OFNACER makes use of ORD expertise only when it requests information on supply conditions. In Madjoari, however, the agents of OFNACER and the ORD work in team.

5.5.3 A Total System View of the Grain Marketing Processes

A synthesis of the ongoing discussion about marketplaces, channels, and standard operating procedures is needed to sum up the understanding gained and the questions and hypotheses still left open.

The grain exchange system in the Eastern region is a mixture of house trading among village households, marketplace oriented trading, and farm gate-oriented grain assembly. In addition, it involves private and public intermediaries who may compete or cooperate. In the literature, the topics that had received extensive coverage are the distinctions between house trade and marketplace-oriented trade, and that between public and private intermediaries. Left out in many cases is the farm gate grain assembly network.

There are a number of features in the E-ORD, that lead us to believe that farm gate grain assembly may be adapted to the local conditions. The region has a sparsely and very unevenly distributed population with a heterogenous ethnic make-up. The road accessibility is very poor. On top of this, the highly variable rainfall pattern induces an instability of grain supplies from year to year. As a result, there are but a small number of rural markets, most of which are periodic or even more temporary. Under these conditions, quite a few transactions take place outside the marketplaces because it is too costly for a merchant to always be present at a given marketplace. Instead, it apparently pays for the merchant to set up an informal agent network which can be called upon

when there is a product to be purchased, to facilitate the merchant in collecting grain (and other agricultural products as well) at the farm gate.

This distinction between market-oriented trade and farm gate-oriented trade in grain assembly is worthy of interest because it has several research and policy implications: First, marketing research that investigates grain flows and prices between markets in the E-ORD must account somehow for house trade and also for the fact that important quantities are exported directly from the farm gate to other regions (particularly by national wholeslaer-retailers), and hence, bypass marketplaces located in the E-ORD. On the other hand, it must be realized that farm gate-oriented trade integrates the marketing services of assembly, bulking, and transportation within the marketing firm and consequently does not operate in isolation of market-oriented trade. For example, many merchants selling to OFNACER in marketplaces have indicated that this opportunity has allowed them to expand their agent network in the countryside.

Second, public officials have expressed some concern about the transactions between private traders and farmers outside marketplaces on the ground that, in these locations, competition for farmers' products may not be as keen as that of inside markets. It is alleged that private traders take advantage of producers who are locked into special relationships with merchants. (One such relationship referred to as green sales will be analyzed later.) Yet, public officials have begun to realize the potential and economy of the private agent network at the village level, after trying to set up their own system. By so doing, the public agency (OFNACER) is in a position to compete directly against

the private traders, and also to pay producers the official price. However, because the official price is uniform nationwide, it actually costs (in logistical services) OFNACER more to operate at the farm gate than to purchase grain from (and thus to cooperate with) merchants at the marketplaces. The policy implication is that either OFNACER rationalizes that this is the necessary high cost to pay in order to provide more revenues to producers in isolated areas, or it may want to share this added logistical cost with producers.

Third, it appears clear that both private and public marketing networks are mostly geared at exporting grain from the E-ORD to other parts of Upper Volta or West Africa. Indeed, this export-oriented system, in spite of some mistrust among traders and their agents, is more effectively structured than the reverse flow of grain from middlemen to consumers, especially in the hungry season and in isolated areas. To the extent that most farm-level grain stocks are large enough to cover more than their owners needs, house trading can help to distribute local grain surplus to other less successful producers and other nonfarm rural consumers. But obviously, house trade will not be effective in doing this if most producers have had harvests too poor to build up or maintain previous stocks. Thus, how to improve the timely availability of food supplies to rural consumers must be an important concern of public officials. (The village cereal bank scheme is such an attempt and the performance of this scheme is analyzed later.)

The issues addressed above prompt several questions. One is about the relative magnitude of the house trade, market-oriented trade, and farm gate-oriented trade in Eastern Upper Volta. Unfortunately, the empirical data that supports this study did not address this question

specifically, and a clear-cut answer cannot be provided. But various marketing participants have emphasized the importance of farm gate trade in such a way that further investigation should be undertaken. (Later we will present empirical evidence related to OFNACER's market share and grain repurchases by producers.)

Another closely related question is whether farm gate-oriented trade in grain is common to other parts of Upper Volta. In another, more densely populated area of Upper Volta (Manga), J. Sherman did not observe such channels outside marketplaces. Besides its dense population and different ethnic background (Mossi), the Magna area has also a better road system (linked to the capital city and most important consuming center) than the E-ORD (personal communication). But in other regions with sparse population, poor roads, and/or with farm gate assembly of export crops (groundnuts, sesame and shea nuts), large quantities of food grain may be collected at the farm gate as well.

Still another series of questions are related to marketing costs in the various trades. For many LITs the lack of working capital puts severe limitations on their scope of operations. It may also be assumed that the small effective demand of poor rural households in sparsely populated and isolated areas makes it costly for LITs to carry adequate stocks and serve many consumers. The poor road system is also bound to affect adversely marketing operations of the various types of traders identified in the E-ORD. Unfortunately, most of these questions cannot be investigated empirically on the basis of the data available in this study. But an attempt can be made to present (if only partially) physical distribution conditions and problems faced by private merchants.

Such an attempt is presented in the next section. (The assumptions and computations are presented in Appendix A.)

5.6 Private Merchants' Physical Distribution Out-of-Pocket Costs

In order to provide an enlarged basis for the diagnosis of problems with grain marketing and sort out priorities for future investigations, this section attempts to illustrate the key physical distribution costs that private merchants incur in performing grain marketing services in E-ORD. The figures derived are out-of-pocket costs (exclusive of return to merchant's labor and management) based on actual operations of merchants. The sources of information used for one category of merchant may come from more than one source (informant), however. The gathering of the information is thus patterned, loosely, to the economic engineering approach of B.C. French (1977). The illustrative approach chosen is dictated by the short time allocated to the gathering of the information and by the nature of the information itself.

First, traders are most reluctant to talk to outsiders about cost margin figures for fear of having to pay eventual taxes. Second, traders do not keep written records because very few can read and write. Third, generalizations about transactions are difficult because many may be undertaken under special relationships between the parties. Fourth, these special relationships as well as others entail gifts in cash or in kind that traders may not reveal as explicit costs of doing business.

The section describes possible cost components related to the marketing functions performed by private traders and illustrates costs of marketing services by building the costs around actual cases of merchants engaged in different marketing channels, such as local independent trader (LIT), a small regional wholesaler-retailer (RWR), and a large

regional wholesaler-retailer (RWR). The costs figure developed is on a unit of one 100-kg bag basis. But because actual volume of transactions was not determined, they are only tentative. (The volume of operation of grain merchants in the region may vary from hundreds of 100-kg bags to less than 500 kg, in a year.)

5.6.1 Cost Components

The physical distribution costs incurred by grain merchants are related to buying, handling, storing, and transporting the grain: In buying grain, besides purchasing the product, merchants may have to pay fees to commission agents, provide gifts to landlords (logeurs), pay salaries and expenses to apprentices, and possibly face monetary losses because of mistakes or cheating by his aides. These losses may be substantial, but unfortunately, difficult to estimate.

Handling costs are related to bagging, hauling from assembly points to warehouse, loading/unloading, and for the user costs of equipment (bags, needle and thread to sew bags, and measurement devices). Bagging is sometimes performed by teenage boys who are paid also to help bring undecided producers to the assembler.

Storage costs incurred by merchants in the E-ORD are for the user cost of the storage space allocated to the grain, the use of pesticides, the physical loss of grain, the capital tied up in inventory, and taxes related to the volume of operations. The user cost of storage space can be estimated by the rent or the amortization of the warehouse. The capital cost is more difficult to estimate. First, we will use the interest rate charged by lending institutions in the area (BND) to approximate the opportunity cost of one FCFA of grain held in storage. Second, we reason that the total amount of money the merchant has to do without

while the grain is held in storage should include the purchase price plus all other costs (of handling and transportation, for example) attached to the grain (see M. Lambert, 1975). Third, in the absence of information as to the rate of stock depletion, we approximate the quantity held in stock during the relevant period by the average stock in this period.

In transportation, merchants may use trucks, donkey carts, and bicycles. Bicycles can carry up to 100 kg bags adequately, but they are also used to control agents or gather market intelligence. Donkey carts are of much less use to carry grain than their number would suggest.[16] The truck used may be operated by truckers along established lines such as Ouagadougou-Fada-Namounou, or it may be hired to transport grain off these established lines, or it may be owned by grain merchants. In addition, truck drivers of public or corporate institutions, without the knowledge of their employers, may provide transport services. Truck transport costs vary according to who provides the service, but they are related to rates changed by truckers in the established lines. Hence, the latter charge will be used.

5.6.2 Illustrative Marketing Costs

The marketing costs are illustrated for a local independent trader, a small (regional) wholesaler-retailer, and a large (national) wholesaler-retailer. For the LIT-located in Namounou, the largest rural

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[16]The 1980 village inventory survey shows that, in 1980, residents in E-ORD owned 1,773 motorbikes (regular bicycles were not enumerated because of their large number), 1,083 donkey carts, 157 private passenger cars, and 36 private trucks (A. Mehretu, 1982, p. 41). Donkey carts are mostly used to collect and transport firewood which cartload value becomes the price charged for transporting grain over similar distances.

market--three representative cases are considered. In the first case, the LIT buys in another weekly market (Logobou) for sale to larger merchants at Namounou, a few days later in the same week. In the second case, the LIT buys grain from producers for sale to larger traders or OFNACER the same day, at Namounou. In the third case, the LIT buys grain at harvest and stores it for resale in the hungry season. For the RWR, we consider the representative case of a small merchant who buys grain at Namounou from LITs, transports it to Fada, for sale by 100 kg bags to urban consumers or women-restaurateurs. For the NWR, we consider the physical distribution costs incurred in the Eastern ORD until the grain reaches his warehouses in Ouagadougou.

On the basis of these assumptions, Table 5.7 summarizes the illustrative costs derived for representative merchants operating in the E-ORD. (The computational details are provided in Appendix A.) Before we attempt any diagnostic assessment it is worth discussing the limitations introduced by the assumptions necessary to obtain our estimates.

First, storage losses are not derived for the same period for all traders. For example, the LIT is assumed to store the grain over the whole year, the wholesaler is assumed to keep the grain in storage only two weeks, and the NWR storage loss is for a three-month period in the countryside in the E-ORD. Second, storage loss and capital cost figures increase with the acquisition price while the other costs behave independently of the price of grain. That is to say, the first costs should change according to where, how, and by whom the grain was brought since those variables determine the acquisition price for all categories of traders. Here, however, this possible change is ignored. Third, cost figures for transportation are valid only for the dry season. Fourth,

Table 5.7

Illustrative Marketing Costs Incurred by Private Traders

Cost Components	Local Independent Trader (LIT)						Small Wholesaler		NWR	
	Case 1		Case 2		Case 3		--			
	FCFA/kg	% of Total Cost	FCFA/kg	% of Total Cost	FCFA/kg	% of Total Cost	FCFA/kg	% of Total Cost	FCFA/kg	% of Total Cost
Buying	--	--	--	--	--	--	--	--	2.50	11.7
Handling	1.6	16.9	1.1	100.0	1.33	12.7	1.6	20.5	2.3	10.9
Transportation	7.5	80.4	--	--	--	--	5.8	74.5	14.5	67.6
Storage	0.2	2.7	--	--	9.13	87.3	.4	5.0	2.1	9.8
Total Cost:	9.3	100.0	1.1	100.0	10.5	100.0	7.7	100.0	21.4	100.0
Marketing Cost in % of Acquisition Price[a]	22.3	--	2.7	--	26.2	--	19.3	--	53.6	--

Source: 1980 Marketing Investigation.

[a]Assumed purchase price is FCFA 4,000 a 100-kg bag of grain.

Note: Details on computation are given in Appendix A.

even though we try to account for regional differences, cost figures, apart from transportation, are normalized for the entire year. Indeed, handling and use of facility in a few areas can be higher (50 CFA for loading/unloading, 50 FCFA for use of facility, for storage) than the rates used here. Fifth, taxes were unaccounted for due to the lack of information on annual volume. Hence, for all preceding reasons, the cost figures should be viewed as conservative; in other words, as minimum costs.

Despite all the preceding qualifications, it is possible to make a number of general comments. Firstly, the costs of transportation (when it has to be undertaken) is the highest and may account for up to 80 percent of total marketing costs. A look at the rates charged for different distances show that the transport cost is a step function with very extended plateaus. Transport rates are quoted between important centers without any discount for secondary centers in between (except when they are very close, by less than 10 km, to one of the extreme points). Examples of the stepwise behavior of transport are shown in Table 5.8.

The overall conclusion is that transport costs are very large for medium-range distances and between centers off main lines. In contrast, transportation over long distances (to Ouaga for example) is the least expensive on a kg per km basis. In effect, the transport cost structure favors the grain export from the region, and within the Eastern region, export from the producing area.

Secondly, storage facilities do not seem to be of much concern for these traders. Only large traders build a facility for the express purpose of holding grain, but most merchants make use of whatever space

Table 5.8

Grain Transport Costs Along Selected Transport Routes

Transport Route	Mode	Distance km	FCFA/kg	FCFA/kg/km
Namounou-Fada	Truck	228	500	21.9
Kantchari-Fada	Truck	150	500	33.3
Fada-Ouaga	Truck	230	500	21.7
Namounou-Ouaga	Truck	458	750	16.4
Kodjari-Namounou[a]	Truck	37	500	135.1
Tansarga-Namounou[a]	Truck	22	400	181.8
Piela-Pouytenga	Truck	63	500	79.4
Logobou-Namounou	Donkey Cart	50	750	150.0
Naponsiga-Namounou	Donkey Cart	35	500	142.9
Basseri Area	Donkey Cart	15	150	100.0

Source: Marketing Investigation.

[a]Off main transport lines.

happened to be available. Physical losses, provided the grain is not kept in storage for more than a year, do not present much concern for the trader. This is more so because most of the damage is passed on to the consumer when the physical appearance is not very much affected. This being the case, lower figures for storage loss from the trader's perspective are misleading as far as consumers are concerned. There may be warranted action to try and lower physical and quality damage to grain in storage.

Thirdly, total costs of physical distribution vary according to whether the trader is a full service merchant or performs a few functions, but also according to whether he operates in the marketplace or mainly outside the marketplace. The costs of operating outside the market presented here are certainly more conservative than the costs incurred in the marketplace, for we did not account for all expenses (travel, control, food, gifts for goodwill building) attached to operating at the village level. Despite these higher costs, large wholesalers are still willing to operate there because of the larger volume secured in a short time. On the other hand, traders incur less cost when they operate at the marketplace because producers are performing some of the marketing functions.

5.7 Summary

This chapter has described the characteristics of rural markets in the E-ORD, identified the major market intermediaries, described the major private and public grain market channels, analyzed key operating procedures of major participants, and attempted to illustrate the out-of-pocket costs of marketing services (physical distribution) performed by private traders.

The region's poor road system, uneven population, and socioethnic traditions are key determinants of the rural market network and periodicity. There is but a small number of major assembly markets and the marketing channels show how private traders attempt to adapt to these limitations by developing a sophisticated network which sometimes bypasses the marketplaces.

The coordination of this marketing network has shortcomings caused by short supply of working capital, mistrust, and the demanding physical control that must be applied in order to reduce losses. OFNACER intervention in the marketing system tries to emulate private traders and introduces some competitive pressure that benefits producers to whom OFNACERs go to in their villages to buy grain.

The marketing channels are geared to move products out of the region, and in spite of their shortcomings, are more effective in doing so than coordinating the back-flow of grain to consumers. The highly dispersed population and the deterioration of the already poor road infrastructure during the rainy season partially accounts for an ineffective back-flow. These conditions may also explain why physical distribution costs incurred by private traders are dominated by transport costs when merchants' time costs are left out. The lack of working capital and the low concentrated effective demand accounts for the small storage costs shown in the illustrative cost figures.

This chapter constitutes a backdrop against which the marketing behavior of grain producers is analyzed in Chapters 6 and 7.

CHAPTER 6

VILLAGE AND FARM-HOUSEHOLD LEVEL ANALYSIS OF GRAIN MARKETING BEHAVIOR

6.1 Introduction

The present chapter analyzes food grain producers' marketing behavior at the farm-household level. A number of studies by anthropologists and economists have attempted similar analysis in other countries. They have described market transactions, estimated grain disposals, and marketed or marketable surplus, but few have generally examined the behavior in the light of the whole farming system. Economic studies, in particular, even though they point to the complex nature of crops produced for home consumption, sale, and other nonmonetary exchange, have often sacrificed the understanding of this complexity to the needs to generalize for the purpose of mathematical modelling. Too often not enough attention has been paid to the "back flow" of grain to the farm-family unit through market as well as nonmonetary exchanges. In addition, the inflow and outflow of grain has not been related to the farm-family cash flow situation.

This chapter will attempt to answer the following questions:

(1) In the make up of the grain flow, what is the relative importance of monetary and nonmonetary transactions?

(2) Are the marketed or marketable surplus, if any, related to the farming system (hoe and animal traction)?

(3) How are grain purchases financed given the cash flow situation?

(4) What is the timing of sales and purchases of grain, and does it relate to price variability?

(5) Do farmers sell and buy back grain, or are selling households different from buying ones?

The following specific points will be addressed: (1) the concepts and operational definitions of grain flow statements, marketed and marketable surplus; (2) the limitations of the data and the consequent estimation procedures; (3) the empirical results of the yearly and seasonal grain flow statements; (4) the empirical estimates of the yearly and seasonal marketed and marketable surplus; (5) the yearly and seasonal cash flow statements; (6) the timing of sales-purchases of grain and related farm gate price behavior; and (7) the empirical evidence of distress sales and repurchases of grain.

6.2 Concepts and Operational Definitions of the Grain Flow Statement, Marketed and Marketable Surplus

6.2.1 Grain Flow Statement

The grain flow statement stems from three related concepts: (1) the conservation of flow principle; (2) the cash flow statement generated in farm management analysis; and (3) the food balance popularized by FAO publications.[1]

The conservation of flow principle states that what flows into the farm-household system either flows out or adds up to stock (see Figure 6.1). In other words:

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[1]Other definitions are food budget, food matrix (Smith, et al., 1981), etc.

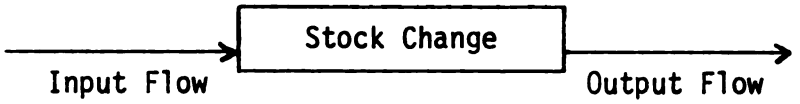

Figure 6.1

Conservation of Flow Principle

$$\text{Output} - \text{Input} = \text{Change in Stock} \qquad (6.1)$$

where output includes all possible household and farm uses, and change in stock is defined here as beginning - ending stock.

The concept of food grain flow is also closely related to that of the cash flow of the farm-family unit and serves similar purposes. The annual grain flow examines the total availability and use of food grain by the household unit, and the seasonal grain flow examines how the variability of the sources and uses of food grain might lead to eventual seasonal food shortages. Thus, both annual and seasonal food grain statements help identify problems that might not have been apparent otherwise.

Finally, the grain flow statement at the farm-family level may be thought of as the micro level version of the food balance sheets established for entire countries or regions of the world by FAO. The purpose of the food balance sheet is to estimate food supply available for consumption by accounting for export-import, industrial use, and waste. A similar measure can be derived in micro level grain flow statement.

Following the pattern of a typical cash flow statement, the fundamental identity of the grain flow statement reads as follows:

$$\text{Total Sources of Grain} = \text{Total Uses of Grain} \qquad (6.2)$$

One important dimension of the marketing component of the 1978-79 farm survey was the identification of all the possible sources and uses of sorghum-millet in Eastern Upper Volta. The sources of grain to the farm-family in Eastern Upper Volta include:

(1) Beginning stock from the previous year crop, purchases and gifts, etc.

(2) Production--the 1978 crop.

(3) Purchases of grain:

  (a) for farm-family uses; that is, home consumption, animal feed and seed;

  (b) for the purpose of later resale;

  (c) for processing and sale of prepared foodstuffs.

(4) Gifts received.

(5) Grain borrowing.

(6) Grain received as payment for loans extended (in cash or in kind).

(7) Grain received as payment for work and services.

On the other hand, the uses of grain include:

(1) Household consumption.

(2) Seed.

(3) Sales:

  (a) of own stock and production;

  (b) of grain previously bought for resale;

  (c) of processed grain (in particular, dolo, sorghum beer).

(4) Gifts given.

(5) Loans extended.

(6) Grain given as payment for borrowing (in cash or in kind).

(7) Grain given to hired workers.

(8) Eventual losses.

(9) Ending stock as of April 30, 1979.

In order to simplify the presentation of the grain flow and related statements, let us classify the sources and uses of grain as identified above into four broad categories: production, exchange, farm and household disappearance, and stock. Production is self-explanatory. Exchange, for convenience, is defined to include all-purpose purchases and sales, gift, credit, and labor transactions. Farm and household disappearance, again for convenience, includes farm uses (seed and feed), household consumption, and losses. Finally, stock refers to beginning and ending inventories.

To simplify further, let us call barter transactions those made up of gifts, credit, and labor transactions; and let us call farm-household uses those for seed, feed, and household consumption. As a result, we may define the following:

$$\text{Exchange Inflow} = \text{Purchases} + \text{Barter Inflow} \tag{6.3}$$

$$\text{Exchange Outflow} = \text{Sales} + \text{Barter Outflow} \tag{6.4}$$

$$\text{Net Exchange Outflow} = \text{Exchange Outflow} - \text{Exchange Inflow} \tag{6.5}$$

Let us also define change in stock as:

$$\text{Change in Stock} = \text{Ending Stock} - \text{Beginning Stock} \tag{6.6}$$

The use of the variables identified above allows an explicit yet compact representation of the fundamental identity of the grain flow statement. Identity (6.2) may be rewritten as follows:

$$\text{Beginning Stock} + \text{Production} + \text{Exchange Inflow} = \text{Consumption} + \text{Farm Use} + \text{Losses} + \text{Exchange Outflow} + \text{Ending Stock} \tag{6.7}$$

From the above expression, identity (6.6) which defines the change in stock may be rewritten as:

$$\text{Change in Stock} = \text{Production} + \text{Exchange Inflow} - \text{Exchange Inflow} - \text{Exchange Outflow} - \text{Farm-Family Use} - \text{Losses} \quad (6.8)$$

Throughout the literature, measures such as food availability, grain disposals, marketed and marketable surplus are used to evaluate the behavior and the performance of farmers with respect to food crops. These measures can be derived from the grain flow statement. Yet, this simple derivation shows that pitfalls and hidden assumptions, which may obscure the meaning of the measures identified above, go often underreported in the literature. Examples are shown below.

6.2.2 Food Available to the Farm-Family Unit

For example, from identities (6.7) and (6.8), we see that:

$$\text{Consumption} = \text{Production} - \text{Net Exchange Outflow} - \text{Farm Use} - \text{Losses} - \text{Change in Stock} \quad (6.9)$$

In food balance sheets such as those constructed by FAO, food supply available for consumption is computed as:

$$\text{Food Available} = \text{Production} - \text{Net Exchange Outflow} - \text{Farm Use} - \text{Losses} \quad (6.10)$$

Also, in many studies and consultant reports, one finds estimates of production available for consumption derived on the basis of one year's data and computed as "raw production minus 4 percent seed and 5 percent for losses" (CILSS, 1977, appendices).

Obviously, since change in stock is not accounted for, the underlying assumption is that change in stock is zero. But this assumption may hold more for the long-run that the short-run. That is, it may be safely assumed that in the long-run (using long time series data), stock fluctuations over particular productive or destructive years even out so

that, on average, beginning stock will equal ending stock. However, in the case of one particular year (using one year's data), there may be a difficult ground to assume identical beginning and ending stocks[2] (see E. Simmons and T.T. Poleman, 1974).

Given the riskiness of rain-fed agricultural production in semi-arid tropical conditions, food stock levels and changes play an important part in farmers' strategy for survival. This consideration makes the question of stock change an empirical issue. Also, given the focus of the present study and the national trend toward the promotion of village grain reserves to alleviate local seasonal shortages, an attempt should be made to estimate the magnitude and behavior of grain stock change.

6.2.3 Grain Disposals

The literature also abounds with grain disposal studies where attempts are made to measure the magnitude of uses from farm grain production. Written in terms of the above grain flow statement, grain disposed of by the farm-family is:

$$\text{Disposals} = \text{Sales} + \text{Barter Outflow} + \text{Consumption} + \text{Farm Uses} + \text{Losses} \quad (6.11)$$

and stock residual is derived as:

$$\text{Ending Stock} = \text{Production} - \text{Disposals} \quad (6.12)$$

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[2]One may still assume identical beginning and ending stock, provided there is reason to believe that the year being studied has followed a long series of consecutive normal years so that it can be argued that producers have no particular reason to add to, or decrease their level of stock. Alternatively, one may assume that over a good representative cross-section of farmers, with grain production following a normal distribution, some producers will increase their stock over the year, but others will decrease theirs so that one can argue that the overall mean will show no stock change.

Conceptually, as shown in the grain flow statement, such studies of grain disposed of provide only a partial picture of the grain movement within the farm-household context. First, the backflow of grain through monetary and barter transactions is ignored. Second, the eventual beginning stock is assumed away. Yet, to the extent that there is any grain in stock at the end of the marketing year, there will be a carryover at the beginning of the next year, which then indicates that there might have been a stock at the start of the present year. If producers do carry grain stock from one year to the next for security reasons, the ending inventory derived above may provide only a partial understanding of producers' behavior. Again, we are faced with the empirical question of stock change.

6.2.4 Grain Marketed and Marketable Surplus

The concept of marketed and/or marketable surplus of food crop has received a great deal of attention thanks to the pioneering work of Raj Krishna (1962) and the many other studies that followed with added refinements (see for example, J.R. Behrman, 1968). The concern over marketed-marketable surplus arises from the fact that estimates of price elasticity of supply, which are an important potential ingredient in agricultural policy design, may not be reliable if they are derived through econometric supply functions which treat food crops like export or industrial crops: owning to the income elasticity of producers' own consumption out of production, the total quantity harvested and its portion made available to other consumers (particularly urban consumers who purchase from the market) may respond differently to prices and other relevant variables.

The main emphasis of the studies mentioned above has remained the derivation of regression coefficients which would relate some measure of marketed or marketable surplus to production, consumption, price, income, and other relevant variables. In the literature, the ongoing debate centers on: (1) how to approach marketed-marketable surplus (i.e., through direct observation or as a residual); and (2) the sign and magnitude of these coefficients. The debate over the sign of the coefficients is an empirical issue (J.R. Behrman, 1968), but it also hides some primary concerns.

The fact that the concepts are operationally ill-defined because of hidden assumptions (discussed later on) obscures the debate. It is also apparent that producers are considered as grain exporters who are satisfying their consumption needs. But what happens if producers are net or absolute importers? The complexity introduced by such a situation is handled with more or less difficulty by current econometric techniques.[3] But more importantly, the results of such techniques are very difficult to interpret in a policy context given the generally poor quality of data used. Thus, before one adds new ammunition to the debate over

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[3]Standard econometric techniques can handle a dependent variable (marketed surplus) with negative, but nonzero values. A difficulty arises over which price series (prices received by producers, prices paid by producers, or a composite market equilibrium price) to use. Current techniques used only one price (retail or wholesale market) in single or simultaneous equation systems. Another and more serious difficulty stems from the fact that the dependent variable (marketed surplus) may assume negative, positive, and zero values because, as will be shown later, there may exist four categories of producers: (1) those without sales nor purchases; (2) those with purchases only; (3) those with sales only; and (4) those with both sales and purchases. Tobit analysis, which has been used to model only sales (see Garcia, 1978; and Sands, 1984) can handle dependent variables with zero values, but without negative values.

regression coefficients, it is worthwhile to ponder the meanings of the concepts themselves in a low income economy.

From the ongoing analysis of the Eastern Upper Volta marketing information, it is clear that a distinction can be made between the monetary transactions involving sales and purchases and the nonmonetary transactions, here loosely defined as barter transactions, which include in-kind gifts exchange, credit transactions, and labor service payments. In addition, it must be realized that even in a predominantly rural economy, food grain is not only sold, but is also purchased. Consequently, marketed surplus to truly represent what actually flows out of the farm-family unit or to serve as an indication of the degree of monetarization, should take account of the back flow of food grain. Marketed surplus is therefore best defined as net market sales; that is:

$$\text{Marketed Surplus} = \text{Net Market Sales} = \text{Total Sales} - \text{Total Purchases} \tag{6.13}$$

Here, total sales include sales of produced grain, sales of grain bought for trade, and sale of processed foodstuffs from grain. Similarly, total purchases include purchases of grain for farm-family use (seed, feed, and human consumption), purchases of grain for trading purposes, and purchases for processing.

Since grain is also exchanged through nonmonetary transactions, the net barter position may be defined to include net gifts given, net credit outflow (loans plus debt payment less borrowing less payments for loans),

and net labor payments (wages of hired labor plus cost of labor "invitations"[4] less wages received).

Consequently, a better indicator of the total grain available to consumers outside the farm-family unit include not only marketed surplus, but also the net outflow from the barter transactions. Let us call it, for convenience, net exchange outflow:

$$\text{Net Exchange Outflow} = \text{Marketed Surplus} + \text{Net Barter Outflow} \qquad (6.14)$$

Identities (6.13) and (6.14) provide an excellent basis to examine the common alternative definitions of marketable surplus found in different studies. The concept of marketable surplus relates to the total food crop potential available for sale. Some authors use marketed and marketable surplus interchangeably; that is, sales net of purchases (identity 6.13). For others, marketable surplus is the net total exchange (identity 6.14) available to participants outside the farm-family unit. Still others add a stock component to either net market sales on net exchange outflow to make up marketable surplus.

The stock component, often included, is accounted in two different ways. First, some authors consider that the residual stock, after an explicit level of security stock is subtracting from the ending stock, will be available for sale. For example, Lassiter (1982, p. 202) defines marketable surplus as "the total value of crops either sold or available for net sale net of requirement for subsistence consumption and food security stocks." The difficulty, of course, is to determine both

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[4]Labor "invitations" refer to traditional work parties of a reciprocal nature in which the "invited" are rewarded in kind (food, sorghum beer, and cola nuts).

reserved consumption and security stock out of ending stock. It should also be noted that the "surplus" stock will include potential sales as well as other potential uses.

A second group considers the change in stock as potentially available for sale. The hidden assumption in such a definition is that the level of the beginning stock is deemed satisfactory or planned, so that any stock above this level at the close of the year might be sold off (or exchanged) once the farmer realizes it. But change in stock may be either positive, when stocks are being built up, or negative, when stocks are being depleted. The interpretation of marketable surplus, which is straightforward when change in stock is positive, becomes less obvious when change in stock is negative. A negative marketable surplus may be saying that the farm-family unit has given up or reduced stocks potentially more than it should or wanted (again, assuming that the level of beginning inventory was planned):

$$\text{Marketable Surplus} = \text{Net Exchange Outflow} + \text{Change in Stock} \tag{6.15}$$

Thus, for this second group, marketable surplus represents not only a measure of the food crop potentially available for sale, or better for exchange, but also a measure of the potential erosion/strengthening of the food balance position of the farm-family unit. However, even though this marketable surplus accounts for change in stock, it does not explain the decision making of households as to the build up or depletion of stocks.

The two different ways of estimating marketable surplus (assuming an explicit security stock level and accounting for change in stock) yield different results unless beginning stock is identical to ending stock and equals the explicit security stock level. A marketable surplus that

uses an explicit end of year stock security level will never drop below the net exchange outflow (or marketed surplus) and will be negative only if net exchange outflow (or marketed surplus) is negative and large. On the other hand, a marketable surplus estimate that includes change in stock may be smaller than net exchange outflow (or marketed surplus) and will be subject to a great deal of variability.

Marketable surplus defined as in (6.15), however, is consistent with the distinction of the direct and indirect approaches of marketable surplus derivation encountered in the literature of supply analysis. The identification of marketable surplus in terms of its components as in (6.15) is referred to as the direct approach. The indirect approach, on the other hand, identifies marketable surplus as a residual on the basis of the grain flow statement.

From identity:

$$\text{Change in Stock} = \text{Production} - \text{Net Exchange Outflow} - \text{Consumption} - \text{Farm Use} - \text{Losses} \tag{6.8}$$

we can derive also marketable surplus (change in stock plus net exchange outflow) as:

$$\text{Marketable Surplus} = \text{Production} - \text{Consumption} - \text{Farm Use} - \text{Losses} \tag{6.16}$$

Thus, implicitely, the indirect approach also assumes that beginning stock is planned or desired stock. As to the controversy of which approach is best (see Medani, 1975; and G. Gemmill, 1978), it appears that the indirect approach has fewer components to estimate, but the degree of difficulty of either approach hinges on the availability and accuracy of the data.

To sum up, the grain flow statement is a useful tool to describe and diagnose producers' behavior and performance with respect to grain

marketing. An important element of this statement is the year-to-year change in stock which affects producers' ability to feed themselves properly. Unfortunately, in the literature, the change in stock is often conceptually assumed away rather than being treated as an empirical question.

From the grain flow statement some of the conceptual limitations of alternative measures of producers' behavior, such as grain disposals and marketed-marketable surplus, are examined. A majority of grain disposal studies have provided only a partial picture of the grain flow within the farm household. This section also clarified the concepts of marketed and marketable surplus to show that part of the debate over marketable surplus can be clarified if it is realized that the different alternative definitions may yield different empirical estimates. By themselves, the nagnitude of these estimates can dispell some myths about producers' grain "export" or "import." Ultimately, however, the difficulty of estimating directly a marketable surplus hinges on the availability of data.

The next section examines openly the limitations of the data in the current study and the consequent estimation procedures advocated to derive the grain flow and other related statements.

6.3 Sources and Limitations of the Data and Estimation Procedures

The grain flow and other related statements are accounting identities, and thus, may be marred by accounting errors. In similar cases, accounting errors are usually checked by matching the observed figure of a "balancing item" against its estimated figure derived as a residual. In cash flow statements, for example, ending cash balance serves as a

"balancing item" to provide an internal consistency check. Unfortunately, the limitations of the 1978-79 farm survey data will not allow a "balancing item" to serve the purpose of internal consistency checking.[5] Herein, we address these limitations and the consequent estimation procedures adopted. But before addressing these issues, a few words about the sample selected for the present analysis are in order.

6.3.1 Sample Selection

In order to permit comparison between animal traction and hoe (traditional) farmers while reducing the larger ORD-MSU disaggregated data base to a manageable size, the present grain flow analysis is focused on zones where animal traction (ANTRAC) practices are used. In those zone, purposely selected ANTRAC households in one village are matched against randomly selected traditional households in another village (for detail, see Chapter 4). However, for the purpose of this analysis, only one ANTRAC village (in place of the three) was selected in the Diabo Zone in order not to overrepresent the ANTRAC farming system vis-a-vis the hoe system (represented by one traditional village). In addition, one household in Ougarou Village was judged "atypical" and dropped, because of its grain trade dealings being larger than that of all the total sample combined. Also, one household that was dropped in Kindi-Kombou Village because its credit transactions were unusually large, obviously

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[5] In the cash flow statement developed on the basis of the farm survey data there is no true "balancing item" either. Partly be design and partly because of difficulties in data collection, beginning and ending cash balances were not measured. Instead, a net cash flow balance is computed and forced into the identity: Net Cash Flow = Sources - Uses.

a misrecording.[6] The total sample size of 13 villages and 234 households was consequently reduced to 11 villages, with 107 traditional households and 89 ANTRAC households (see Table 6.1).

In the sample thus selected, in addition to the breakdown between ANTRAC and traditional farming systems, it is possible to identify villages with known important grain market activities such as Piela and Logobou; villages with easy access to the main road such as Diapangou and Ougarou; villages off the main road such as Diabo (only slightly), Logobou (of difficult access).

For purpose of the grain flow analysis, the sample data is also disaggregated by season of the year into three broad periods.[7] The first, from May 1, 1978 to September 3, 1978, corresponds to the pre-harvest and rainy season; the second, from September 4, 1978 to December 31, 1978, corresponds to the harvest season; and the third, from January 1, 1979 to April 30, 1979, corresponds to the after-harvest and dry season. This breakdown was performed primarily to accommodate the fact that more detailed monthly observations were not available for many

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[6] In Village 23, one household had purchased 164,073.6 kgs. for trade purposes and sold back 131,562.8 kgs. The total volume for all other households of the whole farm survey sample are respectively 25,940.7 kgs. and 18,628.4 kgs. In Village 10, it was misrecorded that one household had paid back 400,320.1 kgs. The total volume for all other households of the whole farm survey sample is 3,833.3 kgs.

[7] Lassiter (1982, pp. 141-142) broke down the year into four seasons: (1) Working Season (May 29-August 30); (2) Hungry Season (August 21-October 15); (3) Harvest Season (October 16-January 7); and (4) Dry Season (January 8-May 28). However, the farm survey started May 1, 1978 and ended April 30, 1979.

Table 6.1

Sorghum-Millet Acreage, Production, and Seed Use, and Total Household Income by Zone and Technology in Selected Zones

Items	Zones											
	Piela		Lantaogo		Logobou		Diapangou		Ougarou		All Zones	
	ANTRAC	Trad.	ANTRAC	Trad.	ANTRAC	Trad.	ANTRAC	Trad.	ANTRAC	Trad.	ANTRAC	Trad.
Sample size (households)	18	18	18	18	18	35[b]	18	18	17[c]	18	89	107
Members per household	9.67	6.28	12.22	6.78	12.17	11.34	12.22	8.00	10.47	7.5	11.36	8.51
Sorghum-millet area (ha per HH)	3.59	2.55	5.03	2.74	3.36	4.06	5.08	3.65	3.77	2.86	4.17	3.31
Seed use rate (kgs/ha per HH)	6.6	12.0	9.4[a]	8.1	12.6	10.4	10.5	8.1	13.0	11.6	10.4	10.1
Production (kgs per HH)	781.4	597.2	1,493.4	751.3	1,735.3	1,964.7	1,486.8	563.5	4,890.9	4,129.6	2,019.7	1,659.0
Total household income (FCFA per HH)	11,631	58,681	167,630	93,317	105,934	136,738	238,605	51,958	266,167	203,071	169,606	113,714

Source: 1978-79 Farm Survey.

[a]Village 26, 27 (ANTRAC farmers) are dropped in order not to over-represent ANTRAC farming system in this zone. But the ANTRAC mean is the mean for all of 3 villages (8, 26, and 27) is kept for lack of better estimate. Seed rate estimate is taken from Lassiter, 1981, pp. 7, 17, 27-29.

[b]One household is dropped in village #10 because of unreasonably high loans.

[c]One household is dropped in village #23 because of "atypical" behavior.

[d]On the basis of 189 valid cases.

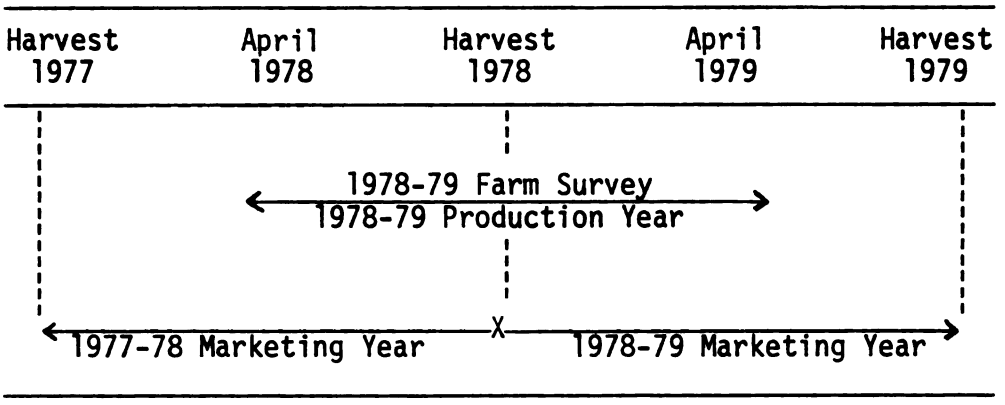

Figure 6.2

Coverage of the 1978-79 Farm Survey and Related Marketing Seasons

components[8] of the grain flow such as stock, consumption, and seed use.

An important limitation of the data is with respect to the annual coverage of the 1978-79 farm survey. As already indicated, the farm survey covers a full 12-month production year from planting to planting. A marketing season, however, usually covers the year from one harvest to the next so that farmer behavior with regard to grain disposals from a given crop can be followed. Therefore, the 1978-79 farm survey covers imperfectly two marketing seasons (see Figure 6.2), which makes the interpretation of sales with respect to the 1978 harvest more arduous than otherwise. This is because it is not warranted to take the observed

[8]The primary intent of the analysis was to use the observations on grain stocks gathered in September 1978, December 1978, and May 1979. The breakdown matches approximately these dates. (See also next sections on stock, seed, production, and consumption data.)

pre-1978 harvest (from May to September 1978) as a proxy for the unobserved post-1978 harvest (from May to September 1979) in order to make up a full 1978 marketing year.[9]

One must keep this limitation in perspective, however. As the grain flow statement shows, if producers carry over stock from other sources than harvest, sales in a marketing year are likely to come from sources other than the year's harvest. Indeed, one may hypothesize that once producers determine they are going to have a normal harvest, the carryover would be sold before the new harvest (Hays, 1975, p. 34), or as the new harvest is being prepared for storage. This fact explains how grain disposal studies that ignore beginning stocks may overstate the importance of one marketing year's harvest with respect to the year sales, and consequently, underestimate the derived food availability.

6.3.2 Yield, Acreage, Production, and Seed Use Data

The 1978-79 farm survey provides three alternative estimates of sorghum-millet yield and production: First is the yield plot, second is the monthly recall of the off-take of each field, and third is the end-of-season recall of total production. Because the estimated yield and production figures differ significantly according to the method

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[9]Matlon (1977, p. 242), faced with the same predicament, concludes that it is not "possible to use the previous (harvest) year's sales during the observed--period as a proxy for late, current (harvest) year's sales (which were not collected)." In order to make up a full marketing year, Matlon went on to estimate a three-month "minimum potential additional sales" to be added to the observed sales "to constitute total projected sales." He assumed that "grains harvested (less 15 percent for seed, storage loss, and gifts) in excess of an amount which would meet average household caloric ingestion levels would--be sold."

used, a judgment as to the "best" estimate has to be made. Previous analyses of the data found that the yield plot method seriously overestimated crop yield and suggested that the "best" estimate would be some average of the monthly field off-take and the end of season total production recalls (Baker and Lassiter, 1980, pp. 46-48; Lassiter, 1981, p. 16; Lassiter, 1982, p. 75). This study uses millet and sorghum production data from this "best" estimate. Seed rate per household computed on a zone and village basis is taken from Lassiter, 1981 (pp. 7, 17, 27-29), see Table 6.1. Grain quantities are computed by using standard kg. conversion factors for millet and sorghum combined (see Appendix B).

6.3.3 Consumption, Stock, and Storage Losses

Stock levels and consumption are two important variables that remain difficult to estimate accurately in micro-level studies. On the basis of the grain flow statement, if one variable is observed, or estimated in some way, the other can be derived as a residual. A review of the farm survey results show that the attempt to collect stock information at three periods (September 1978, December 1978, and May 1979, but not at the beginning of the survey in April 1978) was not entirely successful because many households provided internally inconsistent periodic stock estimates (see an example of such inconsistencies in Appendix C). Without a reasonable basis to correct the inconsistencies, a decision was made not to rely on these stock estimates rather than reduce drastically the sample size by rejecting all faulty cases.

Consequently, to derive the change in stock, we need information regarding grain consumption. There are many alternative estimates of grain consumption per capita to chose from. In various government reports,

annual per capita grain consumption ranges from 170 kg. to 200 kg. In a report to Upper Volta, FAO (1976) had estimated, for the period covering the 1978-79 farm survey, a per capita grain consumption of 175 kg. per year (or .478 kg. per day). In his study of the E-ORD farming systems, Lassiter (1982, p. 65) chose a minimum consumption requirement of .46 kg. per capita per day (slightly higher than FAO's estimate) instead of the simple sample mean (.568 kg. per capita per day) of the 1978-79[10] farm survey.

By using one of these alternatives, we are providing an estimate of the change in stock under a particular scenario. We chose to make a base run of the grain flow statement using a reasonable minimum consumption requirement because it will later on allow us to make stronger inference about whether the households studied meet basic minimum food requirement. The FAO's estimate, which is ameanable to generalization, was thus chosen to perform the base run.

When change in stock is computed as a residual without specific reference to beginning and ending stock, a further complication that

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[10]In order to gather this information, the 1978-79 farm survey interviewed a third of the original sample at four different periods (May 1978, August 1978, December 1978, and May 1979). The results of the daily consumption per household show a significant difference between technology levels, but none between periods. ANTRAC households have higher per household consumption, but only because they have more members than traditional households. The results show mainly a large variability with respect to the number of days (from one to 30 days) within which the grain set aside by the household was supposed to be consumed (see Appendix D). These results lead us to believe that the daily consumption derived represent some target consumption for the farmer.

relates to storage losses[11] is introduced. As already indicated in the grain flow statement, losses may be approximated by storage losses by ignoring other sources of waste. But needed now are estimates of the storage loss rate and the quantity that has remained in stock during the storage period. An estimate of that quantity is difficult to secure.

In cases where there is a periodic replenishment of stock, say within the year, an estimate of the quantity that has remained in stock can be approximated by the average stock; that is:

$$\text{Quantity in Stock} \simeq \text{Average Stock} = \frac{\text{Beginning} + \text{Ending Stock}}{2} \quad (6.17)$$

and the physical storage loss is approximated by:

$$\text{Storage Loss} = \text{Loss Rate} * \underset{(\simeq \text{Quantity in Stock})}{\text{Average Stock}} \quad (6.18)$$

In the absence of beginning and/or ending stock, the quantity remaining in stock may be approximated differently--let us call:

$$Y = \text{Production} + \text{Other Inflow} \quad (6.19)$$

$$X = \text{Farm Use} + \text{Consumption} + \text{Other Outflow} \quad (6.20)$$

Production and other inflow (Y) contribute to stock building, while X represents stock depletion within the period. Consequently, an estimate of the quantity that remain in stock during the period may be approximated by:

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[11] Storage loss is made up of volume loss through volume shrinkage (due to humidity loss), pilferage, grain eaten by pests or fallen through cracks--and quality deterioration--due to insect and fungi infestation. (Eventual storage loss due to unfavorable price change does not apply here.)

$$Z^{12} = \frac{Y + (Y - X)}{2} = \frac{2Y - X}{2} \qquad (6.21)$$

The other difficulty in the computation of storage losses is the storage loss rate. A purposely selected sample of 24 farmers (of whom only seven from the 1978-79 farm survey sample), living in 18 of the selected villages of the sample (five were ANTRAC villages), were asked to indicate five main crops for which they thought the E-ORD should help to reduce storage losses. From the farmers' judgment of how many units of the crops stored could be lost in various periods (months or years), estimates of storage loss rate, in percent per year, were to be derived. The results of these derivations (simple average), on the basis of the available MSU-E-ORD computerized data file, suggest rather samll annual farm storage losses of millet and sorghum,[13] 2 to 3 percent (see

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[12]Obviously, such a proxy is biased downward, for beginning stock is ignored. However, it is not as far-fetched as it may seem since implicitely, it can be derived in studies of farm crop disposals that start with harvest, but ignore beginning stock. In such studies, remaining stock from harvest is (Production + Exchange Inflow) - (Exchange Outflow + Farm Use + Consumption), that is X in equation (6.20). If (Production + Exchange Inflow), i.e., Y is assumed to be stored first before use, then equation (6.21) holds.

[13]Lassiter's figure of 11.3 percent per year is much higher (1982, pp. 155-156). His figure was derived from 67 responses for sorghum storage losses, 47 responses for millet and seven responses for niadi (early millet) and weighed "by the average percentage which each of the three crops contributed to the total sorghum-millet production of hoe subsample farmers." In addition, Lassiter's storage loss rate varies across the year: 23.7 percent in the wet season, no loss during the dry season, and 15.8 percent for the balance of 24 weeks.

Given that only seven farmers were taken from the farm survey sample, we used simple average. It is not clear whether the discrepancy of the two estimates is accounted for by the different weighing methods or the number of cases. There is no information on file about variation of storage loss across the year.

Producers' estimates of storage loss rates as low as 2-3 percent are not unrealistic if one accounts for the fact that spoiled grain (by insect or humidity) is still being fed to animals so that, though the spoiled grain is not consumed by humans, it is not lost for the farm-family unit.

Table 6.2). In effect, they appear rather negligible given our judgment of the level of accuracy of the entire 1978-79 farm survey data set.

6.3.4 Processed Food Grain

Grain processed into food and beverages (sorghum beer, dolo) is an important dimension of the rural economy. Sorghum beer, particularly, is part of the way of life in many Voltaic markets. The farm survey data collected information about both the value and volume of grain purchased for processing activities, but collected only information about the value of processed food and beverages sold. Unfortunately, the sale of processed food grain may be at a loss, and thus the quantity sold is difficult to estimate on the basis of the sale value of the processed food or beverage. For these reasons, it will be assumed that all quantities bought for processing activities are processed and sold, be it at a profit or a loss. Furthermore, the quantity processed that might have come from farmer's own production is assumed negligible. (This assumption, however, holds more for sorghum to be brewed that is considered a cash crop than for millet and sorghum processed in foodstuffs.) In effect, grain used in processing activities will serve as a scaling factor in the sources and uses of grain, but will not affect the change in stock or marketed and marketable surplus in the analysis of the average farmer's behavior.

From the ongoing assessment of the sources of data, it is apparent that the limitations of the 1978-79 farm survey put some constraints on the grain flow and other related statements. In particular, the non-availability of measured consumption and storage data forces us into

Table 6.2

Millet-Sorghum Annual Storage Loss Rate
(Selected Households' Estimates)

Number of Selected Households	Number of Selected Villages	Number of Cases	Time of Storage in Years[c]		Annual Storage Loss Rate in Percent[b]	
			Mean	95 percent C.I.[d]	Mean	95 percent C.I.[d]
24	18	121[a]	2.029	1.667 to 2.390	2.547	2.039 to 3.055

Source: 1978-79 Farm Survey.

[a]There were 69 responses for sorghum-millet (no distinction was made for one or the other), 25 responses for millet, and 27 for sorghum, none for niadi (early millet).

[b]The range is from zero (3 cases) to 25 percent (1 case) and the median is 1.996 percent. The figure is a composite measure for all crops (millet and sorghum).

[c]Time in months was converted into years on the basis of 12 months per year.

[d]Ninety-five percent confidence interval.

estimating minimum grain consumption and deriving change in stock as a residual. However, this change in stock is easily interpreted if we assume that storage losses are negligible; that is, within the margin of statistical error. We will choose this interpretation on the basis of the empirical estimates of farmers' judgment of millet-sorghum losses.

Despite all the mentioned shortcomings, it is felt that the pursuit of the grain flow analysis is worthwhile. First, the 1978-79 farm survey is the best data bank set available on Eastern Upper Volta. Second, the grain flow analysis provides a simple, but sound approach to analyzing food grain marketing behavior. Third, from such an analysis of the farm survey data, many shortcomings can be exposed that should be taken into account in future studies, notably the oncoming proposed food grain marketing study by CRED and USAID in Upper Volta.

6.4 Grain Flow Statement

6.4.1 Annual Grain Flow Statement .

Table 6.3 presents the annual grain flow statement for the average animal traction and traditional households in the five zones being studied. Overall, the relatively low levels of grain production and exchange flows convey very well the modest level of agricultural development of the average farmer in Eastern Upper Volta. Only a few hundred kilograms are dealt with on the average, and though the ANTRAC households deal with more volume than hoe (traditional) counterparts, we must keep in mind that ANTRAC households also have larger families (see again Table 6.1).

Grain production, as expected, makes the better part (74 and 84 percent) of the total annual grain inflow into ANTRAC and traditional

Table 6.3

Annual Grain Flow and Performance Measures by Zones and Technology (Selected ANTRAC Zones)

Flow Items (Average kg by Household)	Piela Zone		Lantaogo Zone		Loaobou Zone		Diapangou Zone		Ouaraou Zone		Total Sample	
	ANTRAC	TRAD	ANTRAC	TRAD	ANTRAC	TRAD	ANTRAC	TRAD	ANTRAC	TRAD	ANTRAC	TRAD
Sources of Grain[a]												
Household Purchases	330.3	115.7	132.4	97.3	502.5	257.3	288.0	116.8	920.4	235.5	429.3	179.3
Trade Purchases	0.0	2.1	1.4	0.0	108.6	61.0	639.9	0.0	276.4	54.4	204.5	29.5
Processing Purchases	0.0	0.3	40.7	11.9	82.6	51.0	69.2	21.2	33.8	24.8	45.8	26.2
Total Purchases	330.3	118.1	174.5	109.2	693.7	369.3	997.1	138.0	1,230.6	314.7	679.6	235.0
Gifts Received	2.1	0.0	6.5	1.8	23.8	19.7	.9	4.4	34.8	56.1	13.4	16.9
Borrowing	0.0	5.6	5.6	9.0	7.4	2.9	0.0	25.1	0.0	5.3	2.6	8.5
Loan Repayment	0.0	0.0	0.0	0.0	2.1	102.1	0.0	0.0	75.9	45.2	14.9	41.0
Wages	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.0	0.5
Total Barter Inflow[b]	2.1	5.6	12.1	10.8	33.3	124.7	0.9	29.5	110.7	109.5	30.9	66.9
Total Exchange Inflow[c]	332.4	123.7	186.6	120.0	727.0	494.0	998.0	167.5	1,341.3	424.2	710.5	301.9
Production	781.4	597.2	1,493.4	751.3	1,735.3	1,964.7	1,486.8	563.5	4,890.9	4,129.6	2,045.9	1,659.0
Total Sources	1,113.8	720.9	1,680.0	871.3	2,462.3	2,458.7	2,484.8	731.0	6,232.2	4,553.8	2,756.4	1,960.9
Uses of Grain[d]												
Farm Sales	0.4	0.0	27.3	9.4	16.2	144.4	71.2	20.7	150.4	424.0	52.0	123.6
Trade Sales	0.0	0.0	0.0	0.0	107.2	89.9	393.9	0.0	160.9	54.4	132.1	38.5
Processing Sales	0.0	0.3	40.7	11.9	82.6	51.0	69.2	21.2	33.8	24.8	45.8	26.2
Total Sales	0.4	0.3	68.0	21.3	206.0	285.3	534.3	41.9	345.1	503.2	229.9	188.3
Gifts Given	1.0	1.0	49.3	17.2	69.0	102.6	40.0	91.0	123.4	83.8	55.7	66.0
Loans Extended	0.0	0.0	0.6	0.0	18.0	10.4	8.7	0.0	15.3	1.1	8.4	3.6
Debt Repayments	0.0	0.0	0.6	9.0	7.4	2.9	0.0	1.1	0.0	48.7	1.6	10.8
Hired Labor	0.0	0.0	1.1	0.0	0.0	0.2	2.1	8.8	1.8	0.0	0.9	1.5
Work "Invitations"[e]	0.0	0.0	2.8	0.0	8.7	3.9	3.1	9.7	22.6	15.9	7.3	5.6
Total Barter Outflow[f]	1.0	1.0	54.4	26.2	103.1	120.0	53.9	110.6	163.1	149.5	73.9	87.5
Total Exchange Outflow[g]	1.4	1.3	122.4	47.5	309.1	405.3	588.2	152.5	508.2	652.7	303.8	275.8
Seed	23.7	30.6	47.3	22.2	42.3	42.2	53.4	29.6	49.0	33.2	43.1	33.2
Feed	6.3	3.3	22.8	13.1	180.4	33.4	125.0	78.0	173.1	17.1	100.7	29.7
Total Farm Use[h]	30.0	33.9	70.1	35.3	222.7	75.6	178.4	107.6	222.1	50.3	143.8	62.9
Consumption (estimated)	1,686.2	1,095.1	2,131.9	1,182.3	2,122.3	1,978.5	2,131.9	1,395.5	1,826.5	1,308.2	1,901.5	1,485.1
Farm-Family Use	1,716.2	1,129.0	2,202.0	1,217.6	2,345.0	2,054.1	2,310.3	1,503.1	2,048.6	1,358.5	2,125.3	1,548.0
Total Uses	1,717.6	1,130.3	2,324.4	1,265.1	2,654.1	2,459.4	2,898.5	1,655.6	2,556.8	2,011.2	2,429.1	1,823.8
Stock Change (residual)[i]	-603.8	-409.4	-644.4	-393.8	-191.8	-.7	-413.7	-924.6	3,675.4	2,542.6	327.3	137.1
Performance Measure (%)												
Farm Sales/Household Purchases	0.1	0.0	20.6	9.7	3.2	56.1	24.7	17.7	16.3	180.0	12.1	68.9
Total Sales/Total Purchases	0.1	.2	39.0	19.5	29.7	77.2	53.6	30.4	28.0	159.9	33.8	80.1
Barter Inflow/Household Purchases	0.6	4.8	9.1	11.0	6.6	48.5	0.3	25.2	12.0	46.5	7.2	37.3
Barter Inflow/Total Source	0.2	.8	.7	1.2	1.4	5.1	0.0	4.0	1.8	2.4	1.1	3.4
Exchange Inflow/Total Source	29.8	17.2	11.1	13.8	29.5	20.1	40.2	22.9	21.5	9.3	25.8	15.4
Farm Sales/Production	0.1	0.0	1.8	1.2	.9	7.3	4.8	3.7	3.1	10.3	2.5	7.4
Farm-Family Use/ Production	219.6	189.0	147.4	162.1	135.1	104.6	155.4	266.7	41.9	32.3	103.9	93.3
Barter Outflow/Farm Sales	250.0	∞	199.3	278.7	636.4	83.1	75.7	534.3	108.4	35.3	142.1	70.8
Total Sales/Exchange Outflow	28.6	23.1	55.6	44.8	66.6	70.4	90.8	27.5	67.9	77.1	75.7	68.3
Exchange Outflow/Total Uses	.1	.1	5.3	3.8	11.6	16.5	20.3	9.2	19.9	32.4	12.5	15.1

Source: 1978-79 Farm Survey.

[a] Beginning stock is not observed.

[b] Barter inflow = gifts received + borrowing + loan repayment + wages (in kind).

[c] Exchange outflow = total barter inflow + total purchases.

[d] Ending stock is not observed.

[e] Refer to traditional work parties of a reciprocal nature in which the "invited" are rewarded in food, sorghum beer, and cola nuts.

[f] See b and c.

[g] See b and c.

[h] Total farm use = seed + feed.

[i] Stock change = total source - total uses. It is equivalent to ending stock - beginning stock.

(hoe) households. (Beginning inventory, however, was not estimated) Similarly, grain consumption is the most important component (81 percent) of the uses of grain by ANTRAC and traditional households. (Here also, ending inventory was not estimated). Conversely, the exchange of grain, acquired or disposed of, plays a relatively smaller role for the average ANTRAC or traditional household (see Figures 6.3 and 6.4).

Table 6.3 shows that for the average ANTRAC and hoe farmers barter plays a very small part in grain acquisition compared to household purchases let alone total purchases (see also Figure 6.3). But grain given out in similar barter form plays a relatively larger part in grain disposals compared to total sales, let alone farm sales (see also Figure 6.4). For example, the average ANTRAC household gives up more grain in barter form (gifts, credit, and labor payments) than through farm sales. For the average traditional farmer, total grain bartered out represents 70 percent of the farm sales.

It is worthy of note, as Table 6.3 shows, that the amount of grain used by households may be larger than the year's total grain production. This is because the extra grain is acquired through some exchange (monetary or barter) and/or comes from stock carryovers. As already noted, grain carryovers were not observed, but the change in stock can be estimated on the basis of the grain flow statement.

In the zones being studies, the results of the grain flow analysis shows that the average household would have accumulated grain[14] over the year if consumption were to be kept at the minimum of 175 kg. per capita per year. In particular, the ANTRAC household would have accumulated

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[14]It should be kept in mind that stock changes include also storage losses (here assumed negligible).

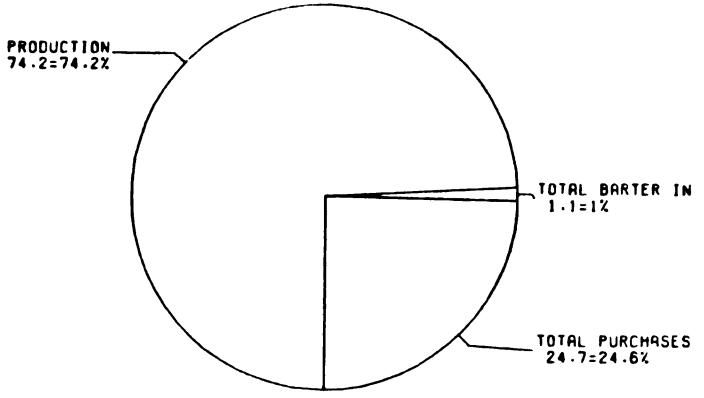

Figure 6.3a

Sources of Sorghum and Millet for ANTRAC Farmers
(Carryover Stocks Not Included)

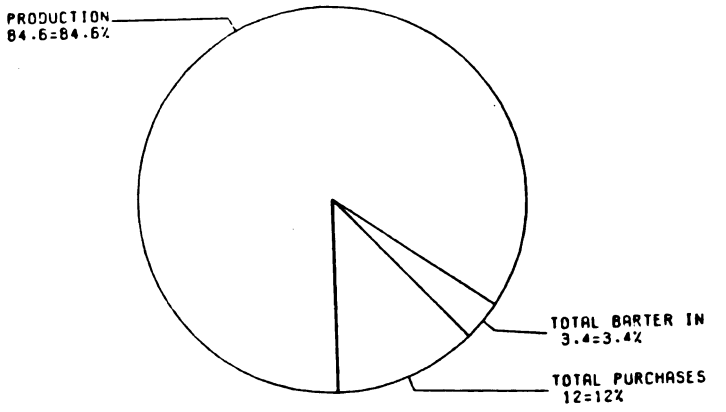

Figure 6.3b

Sources of Sorghum and Millet for Hoe Farmers
(Carryover Stocks Not Included)

Source: 1978-79 Farm Survey.

Figure 6.3

Sources of Sorghum and Millet for ANTRAC and Hoe Farmers

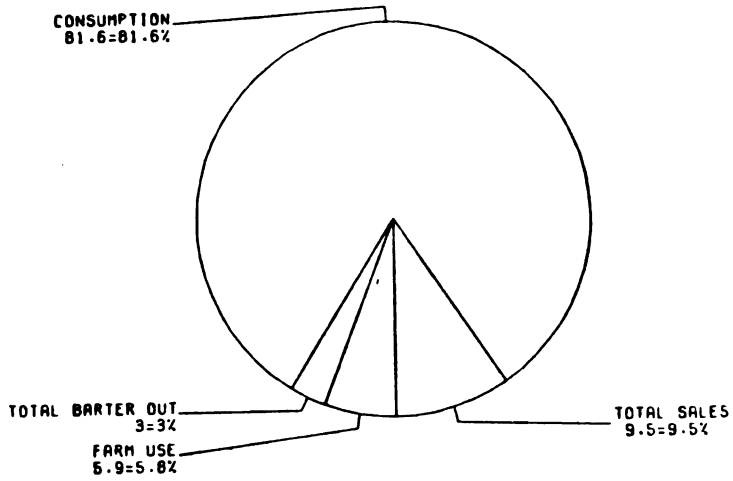

Figure 6.4a

Uses of Sorghum and Millet by ANTRAC Farmers
(Ending Stocks Not Included)

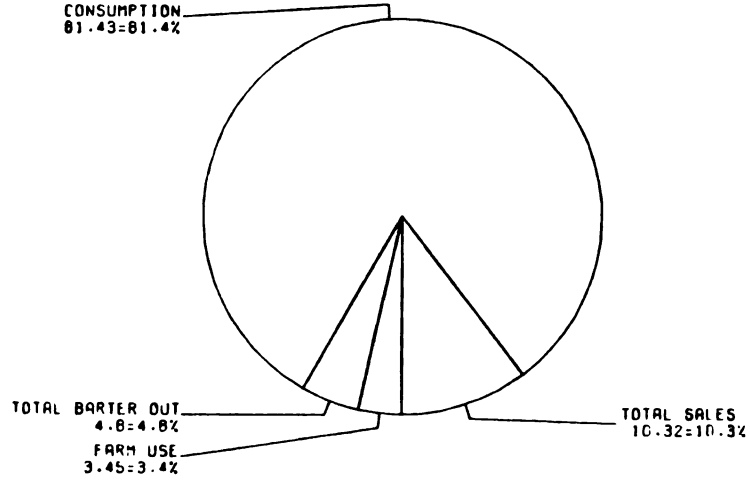

Figure 6.4b

Uses of Sorghum and Millet by Hoe Farmers
(Ending Stocks Not Included)

Source: 1978-79 Farm Survey.

Figure 6.4

Uses of Sorghum and Millet by ANTRAC and Hoe Farmers

more than twice as much grain as its hoe counterpart. The figures on a per capita basis, however, are 28.8 kg. for ANTRAC and 16.11 kg. for hoe farmers and this difference is less significant. Moreover, it appears that the estimated stock build up of ANTRAC households is due to heavy grain purchases as well as large grain production.

Table 6.3 also shows clearly the zonal heterogeniety. (This heterogeneity is also conveyed in Appendix E by figures E.1, E.2, E.3, E.4, and E.5, patterned to Figured 6.3 and 6.4, which compare in each zone the relative importance of the key components of the sources and uses of grain.) For example, the Piela and Ougarou Zones are almost the opposite of each other in terms of production, change in stock, and other key components. A severe drought suffered by the Piela Zone accounts for the poor harvest and the subsequent small disposals.[15]

In many respects, the two villages of the Ougarou Zone are exceptional. Sorghum and millet production per household are the highest of the sample; stocks accumulated are large, and the magnitude of these figures carry a disproportionate weight into the overall means. Oddly enough, grain purchases are heavy too, particularly for ANTRAC. It would appear that whereas the 1978-79 bumper crops translated into relatively large sales for the average hoe household, but the average ANTRAC household still bought more than he sold. It may be that in this particular instance the survey period was not long enough to capture all the sale behavior.

The Logobou Zone is usually thought of as a large producing area with important grain market activities (especially Logobou and Napankore).

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[15]This fact might have been compounded by the lower-than-average performance of the enumerator in this region.

The 1978-79 survey data, however, do not convey strongly this importance. Production was about average, but total sales were far less than total purchases. The average traditional household built up grain stocks over the year, whereas his ANTRAC counterpart has drawn its down.

The Lantaogo and Diapangou Zones display similar features across the farming systems in many respects: The average ANTRAC household has higher production, larger purchases, larger sales, and larger (smaller) stock increase (decrease) than the average traditional household.

The zonal breakdown in Table 6.3 also provides some evidence on the key issue of advanced or "green" sales that will be discussed later in more detail. It can be seen that, on average, debt repayments (either for grain previously borrowed or credit in cash) are not important. Only in Logobou and Ougarou does the evidence on loans repayment received by households suggest the contrary. But even then, the average loan payment received is far less than gifts given in kind. (In most instances, these gifts are made to persons other than merchants.)

In most all other zones than Ougarou, the average household would have drawn down its stock level, assuming the estimated minimum consumption rate. In reality, some households might not have any stock to begin the year. In this case, the negative change in stock suggests that grain consumption is even lower than the minimum consumption assumed in the computation. In particular, when the absolute size of the implied stock

depletion is as important as production, there is a strong indication that grain consumption is below the minimum requirement.[16]

6.4.2 Seasonal Grain Flow Statement

Table 6.4 shows the grain flow within the farm-household by comparing and contrasting zones rather than level of technology[17] over the preharvest, harvest, and postharvest seasons previously defined.

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[16]As an alternative data collection strategy, producers were asked at the end of the farm survey, in May 1979 (i.e., approximately six months into the 1978 marketing year), to estimate grain disposals (sales, consumption, stock, and other uses such as gifts and credit) out of the current year's production. The phrasing of the question obviously missed the fact that beginning stock and grain acquired might have been eventually sold. Furthermore, there is always a potential problem of recall error when asking farmers to look back over six months. For all these reasons, these estimates cannot be directly compared to the results from the comprehensive grain flow statement. However, the results of grain disposals (see Appendix F) lend support to a few broad points referred to in the grain flow statement.

These results confirm the fact that the drought in Piela and the consequent low production level prevented farm sales. They show no evidence of heavy farm grain sales just after harvest. Instead, they suggest that more grain may be disposed of through barter exchange than through sales. But the results contradict also the observation that producers in Piela Zone would not have much to store given the poor harvest in 1978. On the other hand, in Ougarou, the relatively large percentage of grain that remains in stock is consistent with the good harvest in this region.

Overall, the estimated rate of use of grain by farmers themselves helps clarify the situation of the producer's food grain budget. If producers had to feed themselves over the year from the current year's crop, they must keep in stock for use in the next semester somewhat as much as they have consumed the previous six months. On this basis, only a few villages (Ougarou) and Lantaogou (ANTRAC) present strong indications of potential self-sufficiency.

[17]Appendix G shows the seasonal grain flow for ANTRAC and traditional households. It is interesting to note that: (1) farm sales are heavier after harvest than during harvest for both groups; (2) a sizeable proportion of grain is sold in the preharvest season; (3) ANTRAC household's grain purchases are heavier than grain sales throughout the three seasons.

Table 6.4

Seasonal Grain Flow and Performance Measures by Zones (Selected ANTRAC Zones)

Flow Items (Average kg by Household)	Piela Zone				Lantaoga Zone				Loyabou Zone				Diassanou Zone				Ougarou Zone			
	Pre Harvest	Harvest	Post Harvest	Total Year	Pre Harvest	Harvest	Post Harvest	Total Year	Pre Harvest	Harvest	Post Harvest	Total Year	Pre Harvest	Harvest	Post Harvest	Total Year	Pre Harvest	Harvest	Post Harvest	Total Year
Sources of Grain[a]																				
Household Purchases	84.8	79.0	59.1	222.9	100.6	5.8	8.6	114.8	131.8	77.8	131.0	340.6	39.6	70.5	92.0	202.4	351.4	117.2	69.6	568.2
Trade Purchases	0.0	1.0	0.0	1.0	0.7	0.0	0.0	0.7	2.2	63.0	12.0	77.2	21.7	50.6	247.6	319.9	24.9	116.3	17.0	162.2
Processing Purchases	0.0	0.1	0.0	0.1	13.0	5.7	7.6	26.3	12.5	37.1	12.1	61.7	13.0	13.9	18.2	45.1	0.0	8.2	21.2	29.4
Total Purchases	84.8	80.1	59.1	224.0	114.1	11.5	16.2	141.8	146.5	177.9	155.1	479.5	74.3	135.1	357.8	567.4	410.3	241.7	107.8	759.8
Gifts Received	1.0	0.0	0.0	1.0	1.7	0.5	1.9	4.1	8.9	10.3	1.9	21.1	0.5	1.8	0.5	2.8	8.2	32.7	4.9	45.8
Borrowing	0.0	2.8	0.0	2.8	7.3	0.0	0.0	7.3	2.5	1.9	0.0	4.4	4.1	0.5	8.4	12.5	2.2	0.5	0.0	2.7
Loan Repayment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	64.0	4.2	68.2	0.0	0.0	0.0	0.0	0.0	36.3	23.8	60.1
Wages	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	1.5	0.0	1.5
Total Barter Inflow[b]	1.0	2.8	0.0	3.8	9.0	0.5	1.9	11.4	11.4	76.2	6.1	93.7	4.6	1.8	8.9	15.4	10.4	71.0	28.7	110.1
Total Exchange Inflow[c]	85.8	82.9	59.1	227.8	123.1	12.0	18.1	153.2	157.9	254.1	161.2	573.2	78.9	137.1	366.7	582.7	420.7	312.7	136.5	869.9
Production	0.0	689.3	0.0	689.3	0.0	1,122.4	0.0	1,122.4	0.0	1,886.8	0.0	1,886.8	0.0	1,025.2	0.0	1,025.2	0.0	4,499.4	0.0	4,499.4
Total Sources	85.8	772.2	59.1	917.1	123.1	1,134.4	18.1	1,275.6	157.9	2,140.9	161.2	2,460.0	78.9	1,162.3	366.7	1,607.9	420.7	4,812.1	136.5	5,369.3
Uses of Grain[d]																				
Farm Sales	0.2	0.0	0.0	0.2	0.0	7.2	11.2	18.4	47.6	28.2	25.1	100.9	30.3	11.2	4.3	45.9	0.0	68.1	223.0	291.1
Trade Sales	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.0	21.4	21.4	95.8	11.2	0.0	185.7	196.9	17.4	16.4	72.3	106.1
Processing Sales	0.0	0.1	0.0	0.1	13.0	5.7	7.6	26.3	12.5	37.1	12.1	61.7	13.0	13.9	18.2	45.1	0.0	8.2	21.2	29.4
Total Sales	0.2	0.1	0.0	0.3	13.0	12.9	18.8	44.7	113.1	86.7	58.6	258.4	54.5	25.2	208.2	287.9	17.4	92.7	316.5	426.6
Gifts Given	0.0	1.0	0.0	1.0	5.0	17.8	10.4	33.2	32.3	56.0	2.9	91.2	14.7	39.9	10.8	65.4	24.8	57.4	20.8	103.0
Loans Extended	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	6.5	6.2	0.3	13.0	0.0	4.4	0.0	4.4	7.4	0.5	0.0	7.9
Debt Repayments	0.0	0.0	0.0	0.0	0.0	4.8	0.0	4.8	0.0	4.4	0.0	4.4	0.0	0.0	0.5	0.5	0.0	16.4	8.7	25.1
Hired Labor	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.1	0.0	5.5	0.0	5.5	0.0	0.0	.9	0.9
Work "Invitations"[e]	0.0	0.0	0.0	0.0	1.4	0.0	0.0	1.4	4.4	1.1	0.0	5.5	6.3	0.0	0.1	6.4	12.1	4.9	2.2	19.2
Total Barter Outflow[f]	0.0	1.0	0.0	1.0	6.9	22.6	10.7	40.2	43.2	67.8	3.2	114.2	21.0	45.5	11.4	82.2	44.3	79.2	32.6	156.1
Total Exchange Outflow[g]	0.2	1.1	0.0	1.3	19.9	35.5	29.5	84.9	154.3	154.5	61.8	372.6	75.5	75.0	219.6	370.1	61.7	171.9	349.1	582.7
Seed	27.1	0.0	0.0	27.1	34.7	0.0	0.0	34.7	42.2	0.0	0.0	42.2	41.5	0.0	0.0	41.5	40.8	0.0	0.0	40.8
Feed	1.1	1.4	2.3	4.8	5.0	10.3	2.6	17.9	42.0	23.9	17.4	83.3	46.5	21.6	33.4	101.5	19.9	41.3	31.6	92.8
Total Farm Use[h]	28.2	1.4	2.3	31.9	39.7	10.3	2.6	52.6	84.2	23.9	17.4	125.5	88.0	21.6	33.4	143.0	60.7	41.3	31.6	133.6
Consumption (estimated)	582.9	350.5	457.2	1,390.6	694.6	417.7	544.8	1,657.1	849.8	511.0	666.5	2,027.3	739.3	444.5	579.8	1,763.6	653.9	393.2	512.9	1,560.0
Farm-Family Use	611.1	351.9	459.5	1,422.5	734.3	428.0	547.4	1,709.7	934.0	534.9	683.9	2,152.9	827.3	466.1	613.2	1,906.6	714.6	434.5	544.5	1,693.6[i]
Total Uses	611.3	353.0	459.5	1,423.8	754.2	463.5	576.9	1,794.6	1,090.3	689.4	745.7	2,525.4	902.8	541.1	837.8	2,276.7	776.3	606.4	893.6	2,276.3
Stock Change (residual)[j]	-525.5	419.2	-400.4	-506.7	-631.1	670.9	-558.8	-519.0	-932.4	1,451.5	-584.5	-65.4	-823.9	621.2	-466.1	-668.8	-355.6	4,205.7	-757.1	3,093.0
Performance Measure (%)																				
Farm Sales/Household Purchases	0.2	0.0	0.0	0.1	0.0	124.1	130.2	16.0	26.1	36.2	19.2	29.6	76.5	16.0	4.8	22.7	0.0	58.1	320.4	51.2
Total Sales/ Total Purchases	0.2	0.1	0.0	0.1	11.4	112.2	116.0	31.5	77.2	48.7	37.8	53.9	73.4	18.6	58.2	50.7	4.2	38.4	293.6	56.1
Barter Inflow/ Household Purchases	1.0	3.5	0.0	1.7	9.0	8.6	22.1	9.9	8.6	97.9	4.7	27.5	11.6	2.5	9.7	7.6	2.7	60.6	41.2	19.4
Barter Outflow/ Farm Sales	0.0	∞	0.0	500.0	∞	313.9	95.5	218.5	99.8	243.4	12.7	113.2	69.3	440.7	285.1	179.1	∞	116.3	14.6	53.6
Total Sales/Exchange Outflow	100.0	9.1	0.0	23.1	65.3	36.3	63.7	52.6	72.4	56.1	94.8	69.3	72.2	33.6	94.8	77.8	28.2	53.9	90.7	73.2
Exchange Output/ Total Uses	0.0	0.3	0.0	0.1	2.6	7.7	5.1	4.7	14.3	22.4	8.3	14.8	8.4	13.9	26.4	16.3	7.9	28.3	38.1	25.6

Source: 1978-79 Farm Survey.

[a] Beginning stock is not observed.

[b] Barter inflow = gifts received + borrowing + loan repayment + wages (in kind).

[c] Exchange outflow = total barter inflow + total purchases.

[d] Ending stock is not observed.

[e] Refer to traditional work parties of a reciprocal nature in which the "invited" are rewarded in food, sorghum beer, and cola nut.

[f] See b and c.

[g] See b and e.

[h] Total farm use = seed + feed.

[i] Stock change = total ... = total use ... it is equivalent to ending stock - beginning stock.

As expected, for all zones, grain stocks are drawn down in preharvest and postharvest seasons while they are being replenished at harvest. Across all zones, farm sales, even if small, are more important either before or after harvest, rather than during the harvest. Even though the choice of the cutoff points that mark the seasons may have introduced some aggregation bias, it appears that the evidence suggesting heavy farm sales right at harvesttime is not very strong. Further evidence on this subject will be presented in the more detailed timing of sales. Household purchases are also important before and after the harvest season for most zones. Further evidence will also be presented later on the timing of purchases.

A comparison between the largest producing zone (Ougarou) and the smallest (Piela) reveals that households in the deficit zones had had almost no transactions in key components. (This is due also possibly to misreporting). Thus, a comparison between Ougarou and the other zones is more revealing.

Lantaogo, for example, typifies an average-to-poor zone. Household purchases are concentrated in the preharvest or hungry season, borrowing--although small--takes place in this period while debts are paid in kind at harvest, and grain is sold at harvest and in the early postharvest season. In comparison, however, the behavior of households in Ougarou does not fit exactly the pattern expected for large producers because household purchases are still unexpectedly high at harvest, the level of sales is very modest, and no sales were reported before harvest.

The household purchases of the ANTRAC farmers in Ougarou were for social events which often take place in the harvest and postharvest seasons. In addition, the Ramadan (Muslim holy month) which fell on

August-September in 1978, and the subsequent Tabaski (40 days after the end of Ramadan) in November might have added to large food consumption. The large food consumption at these events is indicative of the individual's wealth. To the extent that this wealth effect is shown in Ougarou's average higher household income (see Table 6.1), it would be an indication that producers there may have preferred to buy food when it was abundant rather than deplete their stock even if the year's crop happened to be very good.

If the size of the current year's crop is indicative of the size of the preharvest sales (because it is assumed that the farmer will empty his previous stock for sale once he is assured of a good crop), then preharvest sales in Ougarou should be higher than in other zones. They are not as Table 6.4 shows. Obviously, the lack of information on the previous year's crop makes the interpretation of the preharvest sales very difficult. In the absence of such information, it is not possible to know whether households in Lantaogo, Logobou, and Diapangou follow the pattern hypothesized by Hays (1975, p. 34) and those in Ougarou do not, or whether the large production in Ougarou is of only recent memory so that producers have not yet established the hypothesized pattern.

6.4.3 Stock Change and Minimum Consumption Requirement

At any rate, Tables 6.3 and 6.4 show that stock can change dramatically over one year. But obviously the assumption of minimum consumption requirement introduces a bias in the stock change estimate. In some cases, the bias will be downward, meaning that household consumption has been overestimated. The direction of this bias can be assessed with the introduction of yet another simplifying assumption.

Given that home consumption is derived mostly from production and carryover stocks, if there are households with low grain consumption, they are likely to have suffered a few consecutive years of bad harvests and thus empty stocks prior to the harvests. Let us, therefore, assume a zero stock level at the start of the harvest season. From the grain flow statement, we can then determine the stock level at the end of the farm survey, i.e., May 1979. This stock level, obviously, may be zero, but it cannot be negative. If it were negative, we would have over-estimated the outflow of grain; that is, consumption since all other components are observed estimates. In essence, the above scenario holds that for the poorly-fed households, grain stocks are built up exclusively from the current crops and are drawn down to zero at the start of the next (see Figure 6.5).

The results of such assumptions translate into the projections in Table 6.5. In Piela, the very low ending stocks (18.8 kg.) indicates that the minimum consumption assumed in the derivation of the grain flow statement may have been even lower in that zone. On the contrary, the much larger ending stocks of 4,205.7 kg. and 3,448.6 kg. in Logobou and Ougarou indicate that consumption in those zones may have been underestimated. In the other two zones, Lantaogo and Diapangou, the projected end of stock as of May 1979 indicates that if households had consumed the minimum requirements in the 1978-79 production season, the prospects of a similar consumption level for the next coming semester before the next harvest are very poor.

Given the simplifying assumptions used in their derivation, the results presented above should not be taken literally. However, they seem to point to a potential nonself-sufficiency in many villages of

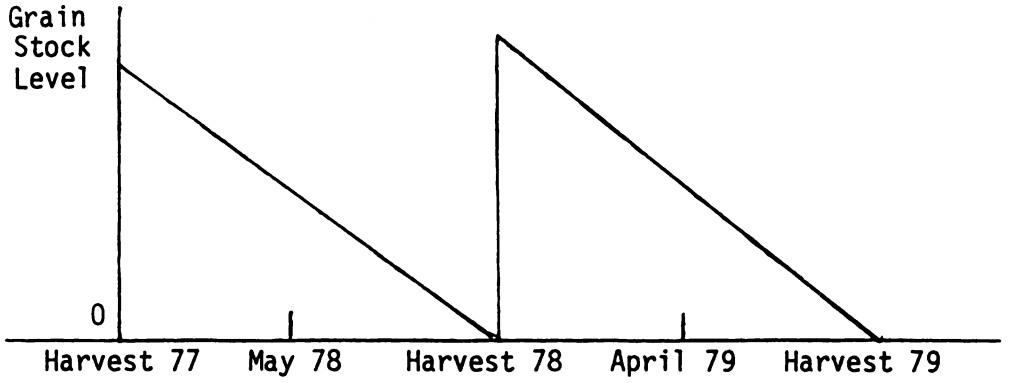

Figure 6.5

Assumed Grain Stock Behavior of Non-Self-Sufficient Producers

Table 6.5

Projected Ending Stock (May 79) Under the Assumption of Zero Stock Prior to Current Harvest (kg.)

Items	Piela Zone			Lantaogo Zone			Logobou Zone			Diapangou Zone			Ougarou Zone		
	Before Harvest	Harvest	After Harvest	Before Harvest	Harvest	After Harvest	Before Harvest	Harvest	After Harvest	Before Harvest	Harvest	After Harvest	Before Harvest	Harvest	After Harvest
Beginning Stock[a]	525.5	0	419.2	631.1	0	670.9	932.4	0	1451.5	823.9	0	621.2	355.6	0	4205.7
Ending Stock (Projected)[b]	0	419.2	18.8	0	670.9	112.1	0	1451.5	867.0	0	621.2	155.1	0	4205.7	3448.6
Stock Change[c]	-525.5	419.2	-400.4	-631.1	670.9	-558.8	-932.4	1451.5	-584.5	-823.9	621.2	-466.1	-355.6	4205.7	-757.1

Source: 1978-79 Farm Survey.

[a]Since stocks are assumed to be depleted prior to next harvest, beginning stock before harvest is (-) stock change (see grain flow statement).

[b]Projected ending stock after harvest is computed as: beginning stock + stock change.

[c]Stock change is computed as: ending stock - beginning stock.

the zones being studied. On the basis of a sensitivity analysis using alternative grain consumption requirements and the changes in sign of the stock change and the marketable surplus as stopping points, we tentatively set the actual annual grain consumption in the zones studied between 165 kg. and 190 kg. (see Appendix H). This transaltes into a daily grain consumption per capita between .45 kg. and .52 kg., which is low. It would not then come as a surprise that there is hardly any marketed or marketable surplus as presented below.

6.5 Marketed and Marketable Surplus

Grain marketed and marketable surplus are key components of the grain flow statement rearranged in a different way to highlight the ability of producers to supply outside consumers while accounting for the farm household grain requirements. Marketed surplus is defined here as total sales less total purchases, while marketable surplus is the sum of marketed surplus, net barter, loss, and change in stock (ending less beginning inventory).

In Table 6.6 the annual marketed and marketable surplus for the average ANTRAC household is compared to that of the traditional household in the selected ANTRAC zones. The picture that emerges throughout the zones shows that both ANTRAC and traditional households were marketed and marketable deficit producers in 1978-79, except in a few villages. The average traditional household in Ougarou is the only example of marketed surplus producer in the study zones. The stock build ups of households in the Ougarou Zone and the traditional villages in Logobou help make them marketable surplus producers. But the marketable surplus is only significant in Ougarou.

Table 6.6

Annual Grain Marketed and Marketable Surplus by Zone and Technology in Selected Zones (Average kg per Household)

Items	Piela Zone		Lantaogo Zone		Logobou		Diapangou		Ougarou		All Zones	
	ANTRAC	Hoe	ANTRAC	Hoe	ANTRAC	Hoe	ANTRAC	Hoe	ANTRAC	Hoe	ANTRAC	Hoe
Marketed Surplus[a]	-329.9	-117.8	-106.5	-87.9	-487.6	-84.0	-462.8	-96.1	-885.5	188.5	-449.7	-46.7
Net Barter Outflow[b]	-1.1	-4.6	42.3	15.4	69.8	-4.7	53.0	81.1	52.4	40.0	43.0	20.6
Net Exchange Outflow[c]	-331.0	-122.4	-64.2	-72.5	-417.9	-88.7	-409.8	-15.0	-833.1	228.5	-406.7	-26.1
Stock Change[d]	-603.8	-409.4	-644.4	-393.8	-191.8	-.7	-413.7	-924.6	3,675.4	2,542.6	327.3	137.1
Marketable Surplus[e]	-934.8	-531.8	-708.6	-466.3	-609.7	-89.4	-823.5	-939.6	2,842.3	2,771.1	-79.4	111.0

Source: 1978-79 Farm Survey.

[a]Marketed surplus = net sales = total sales - total purchases.

[b]Net barter outflow = total barter outflow - total barter inflow.

[c]Net exchange outflow = total exchange outflow - total exchange inflow = (a) + (b).

[d]Stock change = ending inventory - beginning inventory = sources - uses.

[e]Marketable surplus = (a) + (b) + (d) = (c) + (d).

The seasonal marketed and marketable surpluses are presented on a zonal basis in Table 6.7 (Appendix I compares the seasonal marketed and marketable surplus of ANTRAC to that of traditional households. All zones, except Lantaogo and Ougarou had marketed deficit in all three seasons. This deficit outweighs the barter outflow and translates into a position of net exchange inflow for most zones. Here again, the change in stock determines heavily the marketable surplus.

The picture conveyed by the above analysis is that in most zones the average household was a net importer of grain rather than a net exporter regardless of the level of technology. This picture contrasts with the general view of many public officials who have thus far considered most of the Eastern Region as a net grain exporter. Although grain may be available for sale in many parts of the region (see the results of the 1980 Village Inventory Survey, Chapter 7), over the production year, the average household in most zones purchases grain in excess of its market sales. Moreover, in most zones, nothing much in excess of farmers' grain requirements seem to be potentially available for sale, regardless of how marketable surplus might be defined.[18] On the contrary, grain stocks have been reduced below last year's levels.

This picture must change the emphasis of marketing given by public officials for the region. Food grain marketing must not be viewed only

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[18]We recall that in another definition of marketable surplus, net exchange outflow is added to potential sales out of ending stock after consumption and security stocks are accounted for. Even though ending stock could not be accurately estimated, it does not appear that many households would have had any large amount to set aside potential sales, except in the zones of Ougarou and Logobou already mentioned (see Table 6.6).

Table 6.7

Seasonal Grain Marketed and Marketable Surplus in Selected Zones (Average kg per Household)

Items	Piela Zone				Lantaogo Zone				Logobou Zone				Diapangou Zone				Ougarou Zone			
	Pre Harvest	Harvest	Post Harvest	Total Year	Pre Harvest	Harvest	Post Harvest	Total Year	Pre Harvest	Harvest	Post Harvest	Total Year	Pre Harvest	Harvest	Post Harvest	Total Year	Pre Harvest	Harvest	Post Harvest	Total Year
Marketed Surplus	-84.6	-80.0	-59.1	-223.7	-101.1	1.4	2.6	-97.1	-33.4	-91.2	-96.5	-221.1	-19.7	-110.1	-149.6	-279.5	-392.9	-149.0	208.7	-333.2
Net Barter Outflow	-1.0	-1.8	0.0	-2.8	-2.6	22.1	8.8	28.8	31.8	-8.4	-2.9	20.5	16.4	48.0	2.5	66.8	33.9	8.2	3.9	46.0
Net Exchange Outflow	-85.6	-81.8	-59.1	-226.5	-103.7	23.5	11.4	-68.3	-1.6	-99.6	-99.4	-200.6	-3.3	-62.1	-147.1	-212.7	-359.0	-140.8	212.6	-287.2
Change Stock	-536.0	279.5	-406.6	-663.1	-603.3	849.5	-534.1	-288.4	-832.1	1486.9	-507.4	147.4	-867.7	700.3	-497.9	-665.1	-456.8	4180.5	-1835.1	2888.6
Marketable Surplus	-621.6	197.7	-465.7	-889.6	-707.0	873.0	-522.7	-356.7	-833.7	1387.3	-606.8	-53.2	-871.0	638.2	-645.0	-877.8	-815.8	4039.7	-1622.5	2601.4

Source: 1978-79 Farm Survey.

[a]Since stocks are assumed to be depleted prior to next harvest, beginning stock before harvest is (-) stock change (see grain flow statement).

[b]Projected ending stock after harvest is computed as: beginning stock + stock change.

[c]Stock change is computed as: ending stock - beginning stock.

as extracting sales from producers at high prices, but also as managing the back-flow of grain and other food items to producers.

6.6 Timing of Farm Sales and Household Purchases

The magnitude of the grain marketed deficit requires additional attention. In this section, we focus particular attention on average grain sales from the current and past survey years' productions, and average grain purchases for household and farm uses. These two components, farm sales and household purchases, are the center of attention of grain marketing policies.

The grain flow and marketed-marketable surplus statements were not developed on a monthly basis because key components such as production and seed use could not be accurately observed on a monthly basis. In addition, the analysis was carried for the average farmer across all key transactions regardless of how many households did actually participate in these exchanges. Thus, all the disaggregated details on farm sales and household purchases were not shown. In particular, questions regarding the more exact timing and potential distress character of grain sales were only generally observed. Also, the effects of marketplaces, location on/off the main road, and income distribution could not be assessed. This section remedies these shortcomings for farm sales and household purchases in the zones being studied.

6.6.1 Producers Grain Sales and Repurchases

A recurring theme in the literature is that producers sell at low prices at harvest and purchased grain at higher prices later in the "hungry" season. We have already shown in the grain flow statements that larger quantities of grain are being bought rather than sold by the average

producer in the zones studied in Eastern Upper Volta. But we have not shown whether the grain being purchased is by the same households who sell or whether there are two distinct categories of producers, one of buyers and the other of sellers.

There are two reasons why the evidence presented thus far has not spoken directly to the issue of repurchases. First, averaging volumes over all farmers, a necessary step to the previous analysis, obscures the issue. Second, because the data does not cover the entire 1978-79 marketing year, from the information generated it is impossible technically to say whether grain "will be repurchased later" in the (hungry) season. Yet, the fact that producers did buy grain in the planting season prior to the 1978-79 harvest, and that they sold grain at or after harvest, strongly suggests that over a marketing year there will be producers selling at harvest and buying later.

The results of the 1978-79 farm survey actually show four groups of producers: First are producers without farm grain sales nor household purchases; second are those with household purchases only; third are those with farm sales only; and fourth are those with both farm sales and household purchases.

Chi-square tests show that the distribution of households according to this grouping is not significantly related to whether the village has a marketplace or whether it is located on the main road.[19] The same tests suggest, however, a significant relationship with farming

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[19]Among the 11 villages in the five selected ANTRAC zones, five villages (Piela, Napomkore, Logobougou, Diapangou, and Ougarou) have markets, but the farm survey does not provide any information on whether transactions occurred in markets or not. In addition, three villages (Tilonti, Diapangou, and Ougarou) are located on the main Ouagadougou-Niamey Highway.

technology, zonal location, household income classes,[20] and grouping (see Appendix J and Table 6.8). But given the small size of the sample, great care should be taken in assessing the statistical significance of these tests.[21]

Overall, there were 80 fewer farm grain sellers than buyers (see Table 6.9). Some 25.5 percent of the households have had both farm sales and household purchases; a smaller percentage of farmers (9.7 percent) were sellers exclusively; another 14.3 percent of them had no transactions at all, but the majority (50.5 percent) of the households in the selected sample were exclusive buyers of grain for farm and family use in 1978-79.

The results of the analysis of variance in Table 6.8 suggest that households who did not sell any grain had also poorer grain harvests in 1978-79 than those who sold grain, mainly because of the difference in the yields achieved. (Preliminary results did not show any significant difference in areas planted in sorghum-millet among the four groups of households.) The results suggest also no significant average income difference across the four groups, but it would appear that households without grain transactions had much lower average household income than households who sold and repurchased grain.

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[20]The cutoff points of the income classes are as follows: First Quartile $\leq$ 45,103.6 FCFA; Third Quartile $\geq$ 165,626.2 FCFA.

[21]In particular, because of missing cases, grain production (and yield) and income estimates are based on a smaller number of households' responses than that of farm sales and household purchases. It will be assumed that the behavior of the nonrespondents is not fundamentally different from that of the respondents.

Table 6.8

Distribution of Grain Production, Grain Yield and Farm-Household Income According to Grain Transaction Patterns

Actual Grain Transaction Patterns[a]	Average Millet and Sorghum Production[b] (kgs.)	Average Millet and Sorghum Yield[c] (kg./ha)	Average Number of members per Household[d]	Average Household Income (FCFA)[e]	Number of Households in Household Income Classes[f]		
					1st Quartile	Middle Income	3rd Quartile
No transactions	1300.3	358.2	9.2	116,695.3	10	13	5
Household purchases only	1359.6	488.5	9.8	113,089.9	29	49	15
Farm sales only	2260.2	722.4	9.7	136,382.8	2	9	8
Both farm sales and household purchases	2870.0	893.9	10.1	161,120.2	6	24	19

Source: 1978-79 Farm Survey.

[a]Exclude sorghum and millet sales and purchases for trade and processing purposes.

[b]Based on 194 observations. Anova F = 8.3216, significance = .0000.

[c]Based on 194 observations. Anova F = 5.6910, significance = .0009.

[d]Based on 196 observations. Anova F = .1369, significance = .9379.

[e]Based on 189 observations. Anova F = .3213, significance = .8099.

[f]Based on 189 observations. Chi-square = 17.2564, significance = .0084. However, the small number of observations in many cells makes the chi-square test questionable.

Table 6.9

Farm Sales and Household Purchases of Grain in Relation With Farming Technology and Grain Transaction Patterns

Actual Grain Transaction Patterns[a]	Number of Households[b]		Average Sale Per Household (kgs.)[c]		Average Purchase Per Household (kgs.)[c]	
	ANTRAC	Hoe	ANTRAC	Hoe	ANTRAC	Hoe
No transactions	12	16	0	0	0	0
Household purchases only	52	47	0	0	522.1	276.2
Farm sales only	4	15	80.0	208.5	0	0
Both farm sales and household purchases	21	29	205.2	348.3	526.4	213.7
Total[d]	89	107	52.0	123.6	429.3	179.3

Source: 1978-79 Farm Survey.

[a]Exclude sorghum and millet sales and purchases for trade and processing purposes.

[b]The stratification on the basis of values instead of quantity gives the same number of households in the different groups. A slight discrepancy, however, is introduced by missing cases in kgs. relative to values.

[c]Rounding errors account for the discrepancy with figures in other tables in the text.

[d]Based on 196 households' responses.

Added to the fact that the average number of members does not vary significantly across the four groups, these results lead one to believe that farmers without grain transactions were not self-sufficient as might have been thought. But at the same time, there is no indication that the poorest and the smallest grain producing farmers are the ones that are forced into sales and then repurchases.

Table 6.9 lends support to the previous observation that on average ANTRAC households bought more grain for farm-family use and sold less farm grain than their hoe counterparts. But an attempt to characterize in the same way the sale and purchase behavior on the basis of income distribution is more difficult given the small number of observations in many cases (see Table 6.10). The results of this attempt, however, suggest that across the transaction groups the volume of grain sold or bought increases with the household income bracket. This lends support to the hypothesis that as total household increases, farm sales increase (or that farm sales increase constributes to total income) and household purchases increase too.

Looking particularly at the group of households who sold and repurchased grain, it can be seen in Table 6.11 that overall almost 80 percent of the households had repurchased grain in excess of their farm sales. But, on average, hoe households sold more grain than they repurchased contrary to their ANTRAC counterpart. On the other hand,

Table 6.10

Farm Sales and Household Purchases of Grain in Relation With Household Income Distribution and Grain Transaction Patterns

Actual Grain Transaction Patterns[a]	Number of Households in Household Income Classes[b]			Average Grain Sale (kg.) per Household in			Average Grain Purchase (kg.) per Household in		
	1st Quatile	Middle Income	3rd Quartile	1st Quartile	Middle Income	3rd Quartile	3rd Quartile	Middle Income	3rd Quartile
No transactions	10	13	5	0	0	0	0	0	0
Household purchases only	29	49	15	0	0	0	248.1	355.9	793.1
Farm sales only	2	9	8	104.4	95.3	297.6	0	0	0
Both farm sales and household purchases	6	24	19	53.5	161.2	526.3	111.3	298.0	477.4
Total[b]	47	95	47	11.3	49.7	263.4	167.3	258.9	446.1

Source: 1978-79 Farm Survey.

[a]Exclude millet and sorghum sales and purchases for trade and processing purposes.

[b]Based on 189 households' responses.

Table 6.11

Relationship Between Farming Technology and Sale/Purchase Volume Differential for Households with Grain Sales and Repurchases

Ratio of Farm Sales to Household Purchases	Number of Households[a]		Average Volume Differential (kgs.)[d]	
	ANTRAC	TRAD	ANTRAC	TRAD
Greater than 1	6	14	(+)182.1	(+)506.6
Less than 1	14	15	(-)559.8	(-)212.6
Total	21[b]	29	(-)321.2[c]	(+)134.6

Source: 1978-79 Farm Survey.

[a]Based on 50 households' responses in that particular transaction group.

[b]One household had sold and repurchased the same amount.

[c]Based on the total number of ANTRAC households (21).

[d]Volume of grain sales exceed that of purchases if (+).

Table 6.12 shows that in this same group only farmers in the third income quantile had farm sales in excess of their household purchases.[22] These results combined with the large number of exclusive buyers, provides further insight in the grain deficit position of the farmers over the selected ANTRAC zones. Not only did producers buy more grain than they sold as shown by the grain flow situation, but also more producers bought or had larger purchases than producers who sold grain.

6.6.2 Timing of Farm Sales and Household Purchases

The timing of farm sales-household purchases are readily interpreted by reading off the cumulative percentage figures[23] plotted against the time axis of 13 four-week periods ("months"). Evidence of large sales at harvest (distress sales) will be shown by cumulative percent sales larger in period 5 through 9[24] than in other periods, and the

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[22] It should be stressed that the results in Table 6.12 are based on a smaller number of households' responses than that of Table 6.11. Because of the small sample size, a problem of degrees of freedom arises which does not permit a meaningful analysis which would be used in conjunction with farming technology (ANTRAC-hoe households), income classes, and grain transaction patterns as independent variables. As already shown in Table 6.1, on average, ANTRAC households have larger total income than traditional households, but preliminary cross-tabulation results (Chi-square = 1.5267 and significance = .4661) do not suggest any significant relationship between farming technology and the distribution of households in income classes.

[23] The cumulative percent figure is with respect to the total year's transactions and not production. Such a measure avoids the pitfall of assuming that the observed pre-1978 harvest sales are a proxy for the post-1978 harvest sales that were not observed. Yet, such a measure has a merit of its own, for it avoids the pitfall of considering that all farm sales are from the current year's crop. As already indicated, in one marketing year, farm sales may also generate from stock carryovers.

[24] In fact, actual harvest (of early millet) starts about the end of August or early September. By including the whole of period 5 (weeks August 21 to September 17), we increase the likelihood of harvest distress sales in the interpretation of the timing of sales.

Table 6.12

Relationship Between Household Income Distribution and Sale/Purchase Volume Differential for Households with Grain Sales and Repurchases

Ratio of Farm Sales to Household Purchases	Number of Households in Household Income Classes[a]			Average Volume Differential (kg.)[e]		
	1st Quartile	Middle Income	3rd Quartile	1st Quartile	Middle Income	3rd Quartile
Greater than 1	0	10	10	-[c]	(+)179.5	(+)638.9
Less than 1	5	14	9	(-)69.4	(-)362.9	(-)606.6
Total	6[b]	24	19	(-)57.8[d]	(-)136.9	(+) 48.9

Source: 1978-79 Farm Survey.

[a]Based on 49 households' responses in that particular transaction group.

[b]One household had sold and repurchased the same amount.

[c]Not applicable.

[d]Based on total number of households (6) in the quartile.

[e](+) if volume of sales exceed that of purchases.

curve would be s-shaped. Conversely, evidence of concentrated purchases in the hungry season would be shown by cumulative percent purchases larger in periods 1 through 5 than in other periods, and the curve would likely show a plateau in periods 5 through 9 indicating no purchases in the harvest period. But if the curve were to lie on the 45-degree line, the timing of transactions would be interpreted as steady and regular throughout the year.

When we compare and contrast the behavior of ANTRAC and hoe households, the evidence in Table 6.13 does not suggest any harvest distress sales for those farmers who sold and repurchased; only 22 and 35 percent of the annual farm grain was sold during harvest (periods 5 through 9), while 63 and 57 percent of the grain was sold after harvest. For households who had had sales only, the pattern of timing of hoe households cannot be meaningfully compared to that of ANTRAC because of the small number of observations for the latter. (Traditional households had heavy sales, 45 percent of the annual total, in the harvest period, but also important sales, 32 percent, in the preharvest period.) As for purchases, the results show that traditional households had heavy purchases, 61 to 68 percent in the hungry season, while ANTRAC had 41 to 54 percent in the same period. In sum, when the timing of grain transactions of ANTRAC households can be meaningfully compared to that of hoe households, Table 6.13 and also Figure 6.6[25] show that the major significant difference is with respect to the pattern of purchases. Otherwise, there is no strong evidence of harvest distress sales.

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[25]In order to plot the cumulative percent curve, it will be assumed that all transactions are made at the end, rather than midway or at the beginning of the period.

Table 6.13

Timing of Grain Farm Sales and Household Purchases by Actual Transaction Category (Monthly Percentage of Annual Volume), and Average Farm Gate Prices Received and Paid (in FCFA per kg)

Actual Grain Transaction Patterns[a]	May 1-May 28 1978 (1)	May 29-June 24 1978 (2)	June 26-July 23 1978 (3)	July 24-Aug 20 1978 (4)	Aug 21-Sept 17 1978 (5)	Sept 18-Oct 15 1978 (6)	Oct 16-Nov 12 1978 (7)	Nov 13-Dec 10 1978 (8)	Dec 11-Jan 7 1979 (9)	Jan 8-Feb 4 1979 (10)	Feb 5-Mar 4 1979 (11)	Mar 5-Apr 1 1979 (12)	Apr 2-Apr 30 1979 (13)[e]
Both Farm Sales and Household Purchases													
Farm Sales													
ANTRAC	0.0	5.3	0.0	2.4	12.6	6.3	0.5	9.5	6.4	12.6	5.6	38.4	0.4
Trad	1.6	0.0	8.3	3.8	0.3	2.1	1.3	4.3	14.7	15.3	3.8	24.3	20.2
Household Purchases													
ANTRAC	17.7	10.0	16.8	6.7	2.9	0.0	2.5	12.0	21.9	0.3	3.6	1.0	4.6
Trad	18.4	13.4	25.5	4.9	6.5	3.9	1.0	6.0	6.1	6.7	2.5	1.2	3.9
Farm Sales Only													
ANTRAC	0.0	63.3	0.0	0.0	11.9	0.0	0.0	0.0	0.0	9.0	0.0	0.0	15.8
Trad	18.9	11.8	1.8	0.0	8.5	17.9	0.6	6.7	14.2	7.2	5.7	1.2	5.5
House Purchases Only													
ANTRAC	20.5	7.0	7.1	3.4	3.5	3.0	3.7	11.9	6.2	6.1	9.4	7.6	10.6
Trad	11.9	11.7	16.3	7.8	13.6	5.6	2.3	2.9	6.3	2.9	5.0	5.0	8.7
Farm Gate Prices[b]													
Prices Received (FS)[c]	43.7	55.1	58.7	53.9	53.4	41.4	27.8	33.4	34.4	35.1	37.1	40.7	41.8
Prices Paid (HP)[d]	56.5	57.2	49.9	58.3	47.9	50.1	50.1	43.4	35.9	45.6	41.2	49.2	51.5

Source: 1978-79 farm survey.

[a]Based on 196 household-sample in selected ANTRAC zones.

[b]Based on the whole 1978-79 farm survey sample. The large sample size was needed to estimate prices computed as trimmed sample averages for each 4-week period ("month").

[c]FS (farm grain sales).

[d]HP (household grain purchases).

[e]Corresponding periods ("months") are in parentheses.

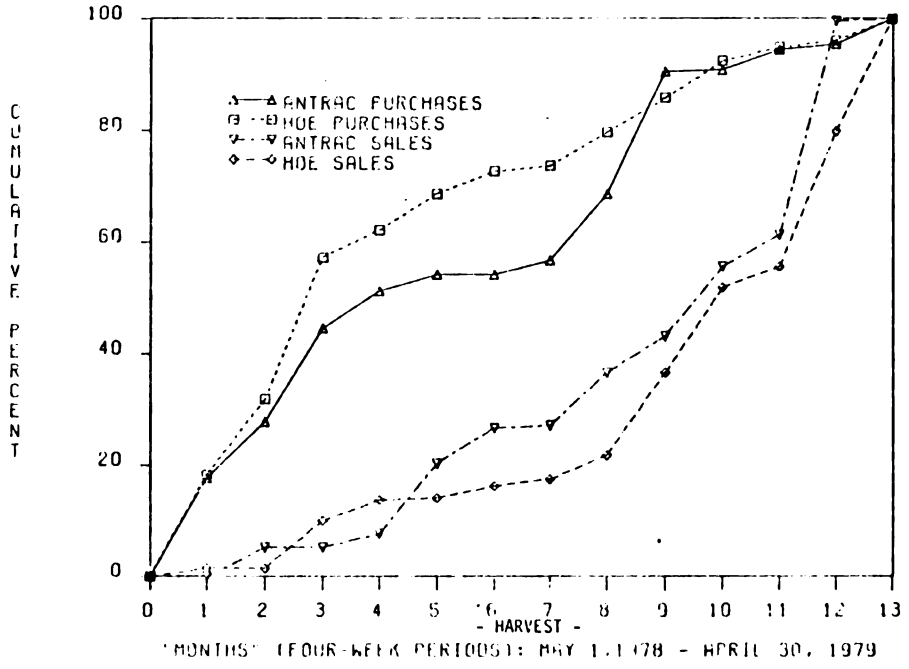

Figure 6.6a

Timing of Farm Sales and Household Purchases
(Households with Grain Sales and Repurchases)

Figure 6.6

Timing of Farm Sales and Household Purchases by
Technology and Grain Transaction Patterns

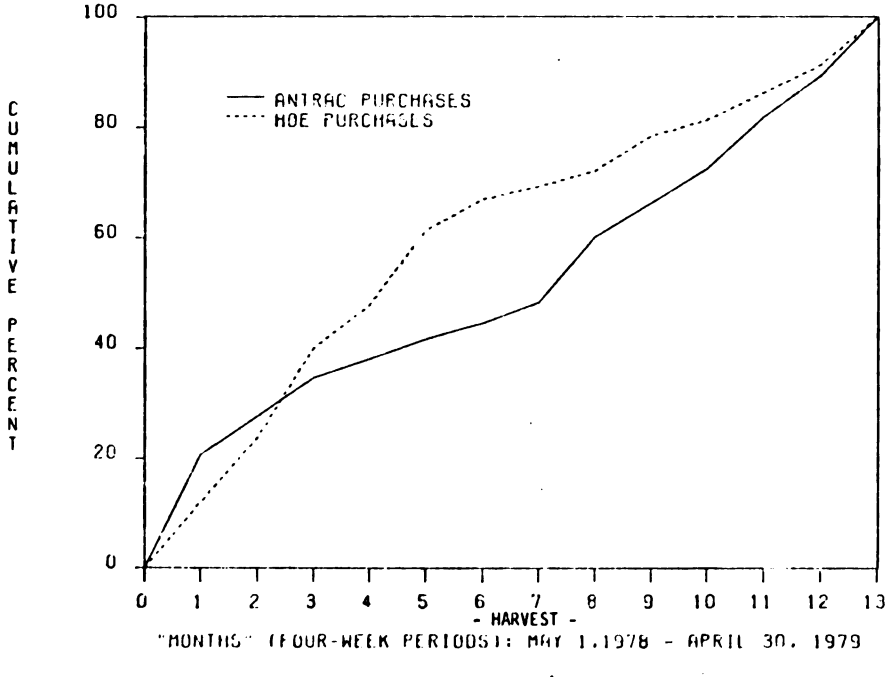

Figure 6.6b

Timing of Household Purchases (Farmers with Household Grain Purchases Only)

Figure 6.6

Timing of Farm Sales and Household Purchases by Technology and Grain Transaction Patterns

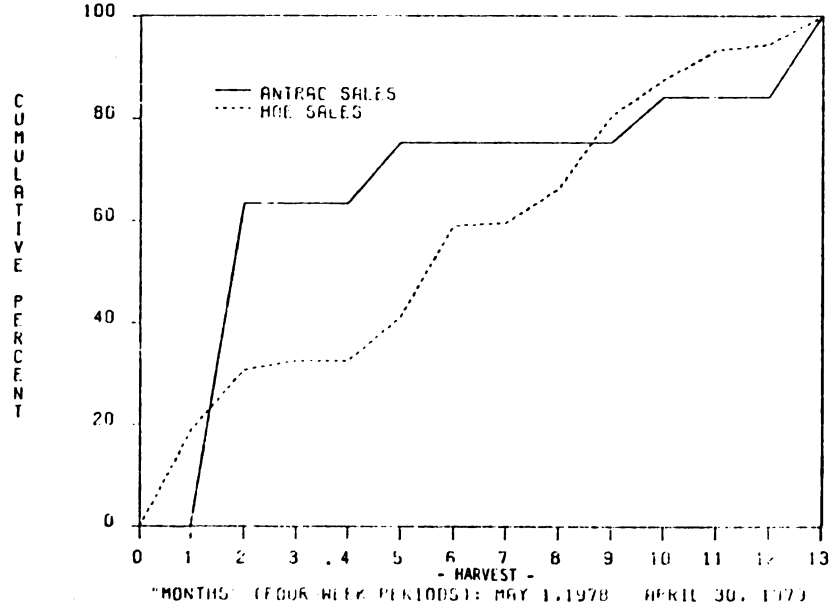

Figure 6.6c

Timing of Farm Sales (Households with Farm Grain Sales Only)

Figure 6.6

Timing of Farm Sales and Household Purchases by Technology and Grain Transaction Patterns

The timing of sales and purchases can then be interpreted with reference only to grain transaction patterns ignoring farm technology (and gaining more degrees of freedom). (See Figure 6.7.) There is hardly any difference between the timing of sales of the households who sold only and the timing of purchases of households who purchased only. Both groups tend to have a regular pattern of transactions throughout the year. It is only for households with both sales and purchases that the data suggest heavy purchases in the hungry season, but for the same group, farm sales are again mainly concentrated after harvest.

When we contrast the behavior of households in the three income classes (discarding the grain transaction patterns), the evidence in Table 6.14 and Figure 6.8 show a somewhat regular pattern of household purchases for all three classes of income throughout the year. For example, by mid-October households in all income classes have purchased about 55 percent of the total amount they bought that year. As for sales, there is only a slight indication that middle income households had heavy sales (42 percent of the year's total) in the harvest period, but even then, an equal amount of grain was sold at a regular pace after harvest. Here again, there is no strong indication of harvest distress sales.

6.7 Farm Gate Prices

The next question that comes to mind is about the impact of market prices on the timing of farm sales and household purchases. Unfortunately, there is no reliable market price series for the Eastern Region for the time coverage of the 1978-79 farm survey. An attempt made in 1978-79 to secure monthly market prices at important marketplaces throughout

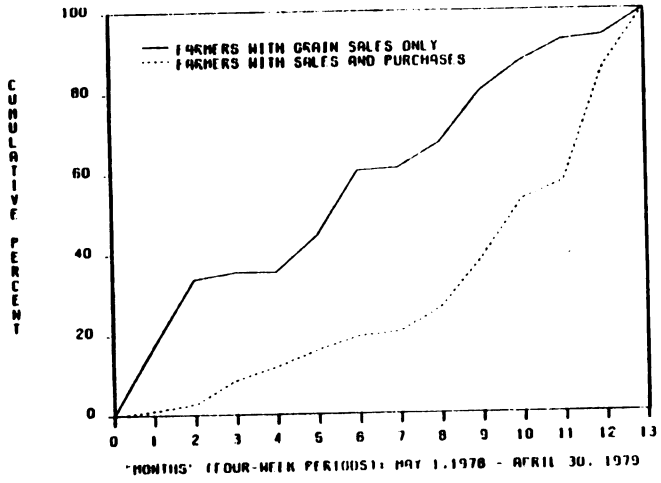

Figure 6.7a

Timing of Farm Grain Sales

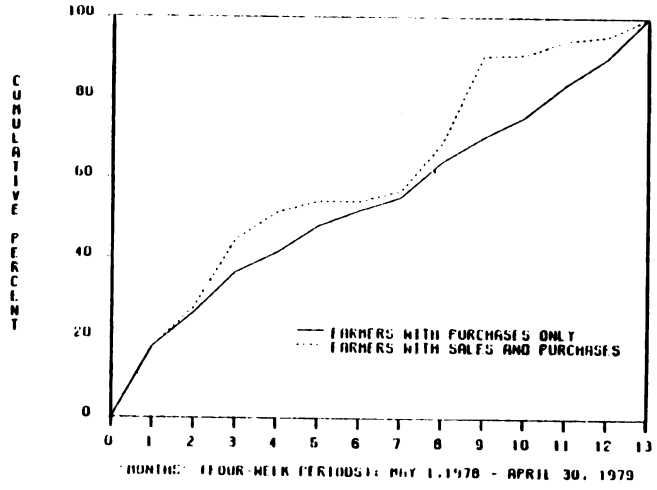

Figure 6.7b

Timing of Household Grain Purchases

Figure 6.7

Grain Sales and Purchases by Grain Transaction Categories

Table 6.14

Monthly Percent of Farm Grain Sales and Household Purchases by Household Income Classes[a]

Sales and Purchases by Income Quantities[b]	May 1-May 28 1978 (1)	May 29-June 24 1978 (2)	June 26-July 23 1978 (3)	July 24-Aug 20 1978 (4)	Aug 21-Sept 17 1978 (5)	Sept 18-Oct 15 1978 (6)	Oct 16-Nov 12 1978 (7)	Nov 13-Dec 10 1978 (8)	Dec 11-Jan 7 1979 (9)	Jan 8-Feb 4 1979 (10)	Feb 5-Mar 4 1979 (11)	Mar 5-Apr 1 1979 (12)	Apr 2-Apr 30 1979 (13)[d]
Farm Sales[c]													
1st quartile	0.0	38.2	0.0	0.0	3.6	.5	3.3	10.8	4.6	17.4	0.0	4.8	16.8
Middle income	.4	8.9	3.6	2.1	13.0	7.8	2.1	8.7	10.5	11.0	7.2	10.6	14.0
3rd quartile	5.9	1.4	5.9	3.1	2.0	5.5	.4	4.7	13.5	14.0	3.7	27.6	12.3
Household Purchases[c]													
1st quartile	9.5	8.3	13.8	7.8	9.8	6.7	12.9	2.1	3.1	7.4	9.0	7.8	1.8
Middle income	16.0	12.9	15.0	4.9	4.8	2.7	1.0	6.8	10.2	4.4	7.9	6.1	7.2
3rd quartile	26.1	7.3	11.0	4.6	6.6	1.9	1.9	11.0	11.8	3.4	3.3	1.4	9.7

Source: 1978-79 Farm Survey.

[a]Total may not add up to 100 owing to rounding errors.

[b]Based on 189 households' responses.

[c]Owing to the small number of cases, no breakdown by categories of actual transaction is made.

[d]Corresponding periods ("months") are in parentheses.

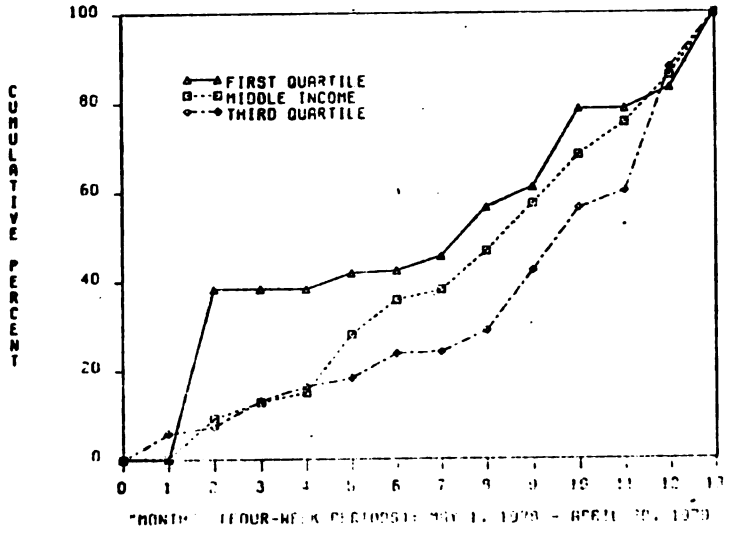

Figure 6.8a

Timing of Farm Grain Sales by Income Classes

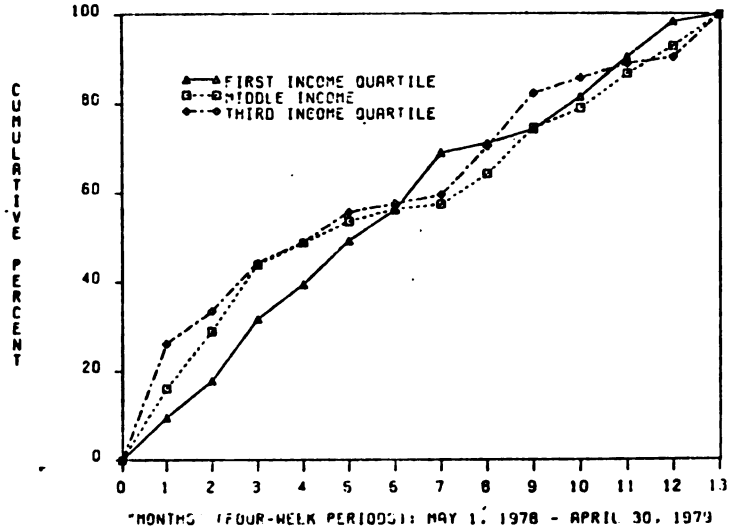

Figure 6.8b

Household Grain Purchases by Income Classes

Source: 1978-79 Farm Survey.

Figure 6.8

Timing of Grain Sales and Purchases by Income Classes

the E-ORD (Mercuriales des prix) was not successful because of the poor performance of E-ORD extension agents and the difficulty of gathering accurate prices without actually measuring the weight of the nonstandardized devices used by participants.

Farm gate prices, however, can be derived from the 1978-79 farm survey. Because the values of transactions entered in computerized files are net of marketing costs (handling and transportation), the unit prices obtained are farm gate prices. Given that there are but a few instances of cash outlays to pay for marketing services by producers, these farm gate prices may approximate market prices in most cases.

One difficulty arising from the derivation of the farm gate prices is the possible measurement error in the kilogram conversion for millet and sorghum. For this reason, the farm gate price may reasonably be accurate on an annual basis (previous analysis used a benchmark of annual price received of FCFA 45.5 per kg.), but not so much so on a more disaggregated monthly or zonal basis. In particular, the smaller the number of transactions, the stronger the possible bias of price variability due to the volume conversion. To circumvent this difficulty, monthly farm gate prices are estimated as trimmed sample averages[26] (see Table 6.13).

In addition, in Table 6.13, trimmed sample averages were computed on the basis of grain transactions for the entire 1978-79 farm survey sample (i.e., 480 households) in order to add more degrees of freedom to

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[26]This measure "trims off" all observations below the first quartile and all observations above the third quartile. The trimming makes the measure less sensitive to the existence of a few unusually large or small observations (see G. Bhattacharyya and R. Johnson, 1977, p. 31).

the estimates. (Trimmed sample averages on the basis of the reduced sample of 196 households show outliers caused by the smaller number of cases which serve for the computation, see Appendix K). In Figure 6.9, the plot of farm gate prices received is compared to that of farm gate prices paid.

It can be seen that average farm gate prices received in 1978-79 were at a level below the official price of FCFA 40 per kg. from mid October to early April. In the preharvest season, however, the level of prices was quite high.[27] The lowest level is reached in October-November, but Table 6.13 shows that producers are not marketing large quantities then, and that grain is mostly sold after January and sometimes a sizeable proportion in the preharvest period. Thus, some producers seem to be able to avoid the very low prices associated with the harvest. However, this price pattern works against the group of households with both sales and purchases since they mostly bought before harvest and sold after harvest.

Overall, prices paid are contained in a narrow band (FCFA 35 to FCFA 60), and thus, shows somewhat less variability than prices received. Based on Table 6.13 the coefficient of variation of prices paid is only 12.6 percent, whereas that of prices received is 21.7 percent. This may be due to the localized nature of grain purchases, but also the fact that food grain provided by aid agencies was sold at low nominal prices and contributed to dampen the variability of prices paid.

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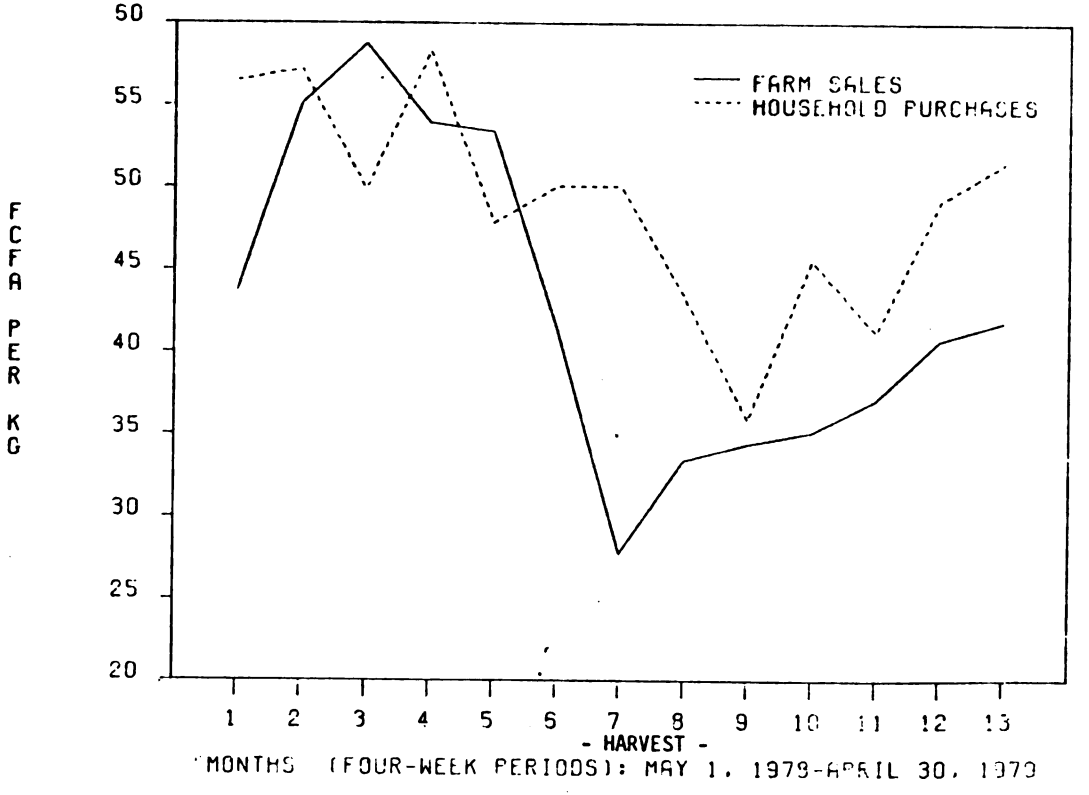
[27]This general pattern follows that of market prices in other parts of Upper Volta reported by J. Sherman (1981) and ICRISAT (A. Bonkian, 1982: see Appendix L).



Source: 1978-79 Farm Survey.

Figure 6.9

Sorghum and Millet Farm Gate Prices (Trimmed)

However, despite the overall higher level of prices paid relative to prices received, the two series of prices appear to move together. In particular, prices paid are not significantly different from prices received in the preharvest season. This suggests that prices paid may bear some relationship to prices received, which is consistent with the picture presented by Figure 6.7 above in which, for a number of producers at least, the timing of farm sales may be similar to that of household purchases.

6.8 Cash Flow

The lack of marketed and marketable surplus in most of the zones being studied, and also the large number of households who bought food grain without selling any in 1978-79 prompts the question as to how the households finance their food and other cash needs, given the fact that cash income actually contributes less than 20 percent to total household income.[28] To shed some light on this matter, we analyze the cash flow in relation to the level of technology, the zonal difference, and the grouping of households with respect to actual grain transaction patterns (in farm grain sales and household grain purchases).

The cash flow statements presented are shown in a light consistent with the derivation of the grain flow statement. As in the grain flow statement, the cash flow statement does not estimate any beginning and ending balances; instead, the net cash is estimated as a residual just as is the change in stock. Crop sales refer to sale of sorghum-millet and all other crops (e.g., peanuts, bambara nuts, cotton, etc.) grown

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[28]Preliminary analysis shows that based on 189 households' responses, cash income accounts for 14 percent of total household income on average (see also Barrett, et al., 1981).

by the household. In addition, net cropping revenue is defined as the sum of all crop sales and cropping related revenues (custom plowing, for example) less the sum of crop input costs and related service expenditures (costs of custom plowing, for example). And net cropping cash surplus, defined as net cropping cash revenues less foodstuff expenditures, measures the capacity of the household to finance its additional cash food and other expenditures out of cropping revenues.

Table 6.15 presents the annual cash flow for households stratified with respect to technology, zone, and grain transaction patterns in the zones being studied. Sources of cash are derived mainly from grain and other crop sales, livestock, credit and nonfarm revenues (off-farm employment, artisan enterprises, trade in consumer goods, and in a few cases military pension or heritage). It would appear that a large part of total crop sales in the source of cash is not associated with large sources of cash or positive net cash flow. In fact, Table 6.15 suggests that regardless of how one stratifies households in the zones being studied, crop sales are not the first contributor to cash revenues (except only marginally in Ougarou Zone). The average household relies more on livestock and nonfarm enterprises to generate cash income.

The above results help explain why the average households in the largest and the smallest grain producing zones are the only ones with negative net cash flow, and why they have also the lowest level of sources of cash. In fact, as shown by the negative net cropping cash surplus, cropping revenues are not adequate to provide cash to purchase food in most instances. The above results show also that animal traction technology is net yet well developed to pay for itself through cropping revenues.

Table 6.15

Annual Cash Flow and Performance Measures by Ecological Zones, Technology, and Grain Transaction Pattern[a]

Cash Flow Items	Ecological Zones					Technology		Grain Transaction Patterns			
	Piela	Lantaogo	Logobou	Diapangou	Ougarou	AMTRAC	Trad	No Transactions	Buy Only	Sell Only	Sell and Buy
Sources of Cash	6,323	102,093	99,743	301,275	75,370	189,073	54,632	93,375	133,622	94,639	100,640
Crop Sales	293	3,533	18,562	8,765	21,119	12,455	10,305	5,498	5,894	15,216	23,694
Farm Services	0	188	844	643	228	929	0	54	461	371	570
Agricultural Trading	11	799	18,215	24,788	6,057	14,535	7,526	5,523	9,485	20,816	12,194
Ag. Processing and Gathering	346	3,548	6,791	7,783	6,697	8,096	2,749	2,791	4,258	4,535	8,577
Livestock	4,682	33,146	24,936	162,034	20,972	86,589	14,432	31,346	67,159	21,585	26,281
Credit	831	13,172	12,867	15,014	4,741	15,366	4,906	3,236	12,198	4,303	10,251
Other Sources	160	47,707	17,528	82,248	14,556	51,103	14,714	44,926	34,167	27,813	19,073
Uses of Cash	16,954	55,350	94,445	233,045	91,490	165,289	41,958	62,410	107,977	84,908	102,997
Crop	1,131	3,078	5,356	4,371	3,316	4,511	2,872	2,660	3,334	4,023	4,556
Agricultural Trading	1,354	672	15,028	33,254	7,071	18,354	6,560	10,010	9,251	21,697	14,113
Ag. Processing and Gathering	978	2,215	5,302	7,128	1,141	6,095	1,402	1,992	4,387	2,619	3,092
Livestock	1,246	20,039	21,781	127,096	31,537	72,151	11,014	28,601	45,068	18,003	39,906
Credit	217	19,512	16,365	17,895	9,889	20,245	7,160	5,093	16,219	8,997	12,974
Equipment	176	1,163	2,209	1,811	26	1,992	505	688	1,244	3,097	603
Foodstuffs	11,833	5,445	14,394	15,535	25,633	21,393	8,761	1,081	19,839	1,770	16,268
Other	19	3,226	14,010	25,955	12,877	20,548	3,884	12,354	8,635	24,702	11,485
Net Cash Flow	-10,632	46,742	5,297	68,231	-16,118	23,784	12,674	30,964	24,645	9,731	-2,357
Net Cropping Surplus	-13,147	-6,115	-991	-11,952	-12,212	-16,409	-1,339	-45	-18,763	9,748	1,398
Performance Measures (%)											
Sale/Source	4.6	3.5	18.6	2.9	28.0	6.6	18.9	5.9	4.4	16.1	23.5
Animal Revenue/Source	74.0	32.5	25.0	53.8	27.8	45.8	26.4	33.6	50.3	22.8	26.1
Food/Use	69.8	9.8	15.2	6.7	28.0	12.9	20.9	1.7	18.4	2.1	15.8

Source: 1978-79 Farm Survey.

[a]Based on 196 households' responses.

A comparison of households statified with respect to patterns of grain transactions show the following major points. On average, households who did not sell any grain, but still have sold some other crops have generated a value of crop sales far smaller than that of households who did sell grain (and other crops as well). This result is consistent with the observation that grain is the most important farm grown crop sold by the average farmer in the E-ORD. To compensate for their low level of crop revenues, these households without grain sales generate a significantly larger percent of their cash through livestock and nonfarm sales than households with grain sales (with or without repurchases). This is also consistent with the fact that households with no recorded animal sales derive also a significantly larger percent of their cash through crops sales than households with animal sales (see t-test results in Table 6.16).

Another major point is that the average household which purchases grain (with or without sales) allocates a larger proportion of its cash expenditures to pay for foodstuffs (see Table 6.17). Again, this is consistent with the observation that grain is the most important foodstuff bought by the average household in E-ORD. As a consequence, one finds that households with no reported grain purchases (or no transactions) allocates a smaller percentage of cash expenditures to foodstuffs purchases (see Table 6.15). Households in that category spends on average less than 3 percent of cash expenditures on foodstuffs.

This low percentage of cash expenditures on foodstuffs for households with no recorded grain purchases is surprising nonetheless. This is because these households have also the smaller grain harvest in the group, and yet, over the 1978-79 season, they have accumulated the

Table 6.16

Relationship Between Cash Generation Through Crops and Animal Sales and Patterns of Grain and Animal Transactions

Grain and Animal Transaction Patterns	Percent of Crop Sales to Total Cash Inflow				Percent of Animal Sales to Total Cash Inflow			
	Number of Cases	Mean	T-Value[a]	One-Tail Probability[a]	Number of Cases	Mean	T-Value[a]	One-Tail Probability[a]
No Grain Sales	127	11.1	-5.49	.000	127	35.7	2.87	.002
Grain Sales	69	29.6			69	21.4		
No Animal Sales	57	25.3	3.12	.002	57	0.0	-10.02	.000
Animal Sales	139	14.5			139	43.2		

Source: 1978-79 Farm Survey.

[a]Pooled variance estimates.

Table 6.17

Relationship Between Cash Expenditures on Foodstuffs and Patterns of Grain Transactions

Grain Transaction Patterns	Percent of Food Expenditures to Total Cash Outflow			
	Number of Cases	Mean	T-Value[a]	One-Tail Probability[a]
No Grain Purchases	47	4.4	-7.48	.000
Grain Purchases	149	36.8		

Source: 1978-79 Farm Survey.

[a]Pooled variance estimates.

largest net cash flow. The large positive cash flow may have resulted from underreporting, or be explained by the fact that households may have postponed payment, of sensitive cash outlays such as animals or credit (see Tapsoba, 1981).

The monthly cash flow statements (see Appendix M) show that in spite of his positive annual net cash flow, the average ANTRAC farmer spends the early part of the growing season with a negative cumulative cash flow. This pattern, however, may be more representative of farmers with grain sales and repurchases than for ANTRAC. If such pattern was to be repeated every year, it may present some liquidity constraint to this group of farmers.

The monthly cash flow statements do not clearly show an inverse relationship between crop sales and animal sales which would suggest that at one time households may raise relatively more cash from animals and at another time raise relatively more cash from crops. This may be due to the fact that animal sales are averaged over all households even though not all households have effectively sold animals. To correct this impression, we consider only households which had actually sold both grain and animals and we compute zero and higher order (controlling for zone, technology level, and period of the year) correlation coefficients between the percent contribution of crop sales and animal sales to cash revenues. These correlation coefficients indicate that crops and animal sales may indeed by inversely related significantly, even if the strength of the relationship is weaker than expected (Table 6.18).

Overall, the evidence from the cash flow analysis shows that crop sales are a relative minor part of the sources of the farm-family cash

Table 6.18

Relationships Between Crops and Animal Sales Contribution to Cash Inflow

	Zero-Order Correlation	Third-Order Correlation (Controlling for Zone, Technology and Time)
Correlation Coefficient	-.602	-.576
Number of Cases	127	100[a]
Significance Level	.001	.001

Source: 1978-79 Farm Survey.

[a]Missing data (and list wise deletion) accounts for the small number of cases.

revenues. Crop sales, at most, makes 40 percent of cash revenues in November-December for households who sell and repurchase grain, and less than 5 percent in December for households without grain transactions. These figures convey the low monetization level of farmers with respect to crops, but not necessarily with respect to other enterprises. They also show the diverse nature of the farm-family economy even at this low level of development. In particular, they show the critical importance of livestock revenues and also that taken together, revenues from agricultural trading, processing, and gathered products (e.g., shea nuts) are larger than revenues from farm crop sales. Once again, we are shown that food marketing at the village level must not only be concerned with crop sales.

The figures also show that cash outlays for food are relatively more important for traditional households than for ANTRAC households. Yet, in absolute terms, ANTRAC households still spend in cash more on foodstuffs than traditional households (partly because of larger family size), but cash outlays for cropping enterprises, livestock raising, and equipment are even higher. Thus, they are being forced into more cash outlays while the cash generating power of the cropping enterprise remains very small.

6.9 Summary

This chapter has analyzed producers' behavior with respect to grain marketing at the farm-household level by examining the grain flow statement, marketed and marketable surplus, the timing of farm sales and household purchases, farm gate prices received and paid, and the monthly cash flow statement. The overall conclusion is that grain marketing covers both purchases and sales by producers even in a low-income economy.

Conceptually, the grain flow statement, rather than grain disposals, provides a better approach to the understanding of producers' behavior; and a key to the understanding of this behavior in the short-run is the annual change in stock. Marketed and marketable surplus which are derived from the grain flow statement have hidden assumptions with respect to the change in stock, and thus, may yield significantly different results depending on the treatment of stock. In addition, by establishing the grain flow statement, it can be shown that short-run cross-section studies of food availability at the farm-household level

may yield inaccurate results because they often assume implicitely that the change in stock over the year is zero.

The grain flow and marketed-marketable surplus statements were developed for a selected subsample under the assumption of a minimum consumption requirement. Furthermore, the statements are restricted to three seasons that span a growing agricultural year rather than a marketing year. Despite these limitations, they show clearly that the average ANTRAC and traditional households were both marketed and marketable deficit producers with the exception of a few households in only a few villages. The results suggest that many may even have had grain consumption below the assumed minimum requirement. This situation worsens particularly for the ANTRAC households because of their larger family size.

The pattern of farm sales and household purchases are slightly biased when they are examined as if all households buy and sell. When households are stratified into four categories of actual transactions, the results show that the largest group of households buy grain only. Also, ANTRAC households tended to be more buyers than sellers.

There is but a small difference between ANTRAC and traditional households when it comes to the pattern of sale and purchases, except for the fact that some ANTRAC households have had large purchases in the harvest season to accommodate social events. Also, the distribution of farm income does not affect significantly the timing of transactions. Rather, it appears that the difference may be related to the types of actual transactions. Households which sell only, or which purchased only, seem to trade more evenly year-round than households who sold and bought. For the latter group, the pattern of transactions

show heavier sales after harvest and heavier purchases in the pre-harvest season than in any other period.

Thus, for the last group of households, the evidence suggests that price variability might further worsen their situation. Farm gate prices received tend to move together with farm gate prices paid. The high level of prices paid relative to prices received may affect more the relatively few farmers who bought and sold. For others who tended to have sales and purchases nearly better balanced throughout the year, the price variability will have less impact.

The importance of crop sales in the cash flow is not as dominant as might be expected. To generate cash producers are engaged instead in other farm and nonfarm related activities such as livestock raising, trade, and employment off-farm. In 1978-79, the average household, in the zones being studied, was not able to cover its food purchases out of its net cropping revenues. Introduction of ANTRAC puts consequently added cash constraints on farmers.

CHAPTER 7

GRAIN PRODUCERS' MARKETING LINKAGES AND PROBLEMS

7.1 Introduction

This chapter focuses attention on the identification and diagnosis of grain producers' marketing problems. It is based on information about the structure of the E-ORD grain marketing system (see Chapter 5), producers' patterns of grain marketing behavior (see Chapter 6), and other empirical data from the 1978-79 farm survey and the 1980 marketing investigation.

Public officials perceive that producers are at a disadvantage in their linkages with private traders. One such area of concern relates to the measurement of grain when producers sell to private intermediaries. Another area relates to marketing credit which private traders allegedly provide it at usuary terms to producers in order to gain a low cost access to grain supplies at harvest. OFNACER (see Chapter 3) was instituted partly to minimize these alleged negative effects, and aims at reducing private traders' market shares and promoting better measuring techniques. Further, in the E-ORD, "Village Cereal Banks" have been set up in village groups (groupements villageois) to help producers cope with local seasonal food grain shortages and the consequent credit need referred to above.

The design of effective grain marketing policies requires empirical evidence to analyze the issues mentioned above. It also requires an

evaluation of the Village Cereal Bank scheme. Does the scheme fulfill its intended objectives and farmers' real needs? Policy design requires also an analysis of producers' perceptions of problems and, if any, suggested solutions for improvement.

7.2 Marketing Problems Felt by Producers

We are concerned with first, producers' awareness of marketing problems and then solutions to these problems which producers may think of. Also, of particular interest to public officials is the perception of producers towards the E-ORD and OFNACER after these agencies' previous lackluster marketing campaigns (see Chapter 3 for details).

7.2.1 Producers' Awareness of Marketing Problems

At the close of the 1978-79 farm survey, producers were asked first to recall the major topics discussed with the extension agent, and then to note important topics which might have been overlooked by the extension agent, but should require attention by the E-ORD. Obviously, the fact that E-ORD management had no grain marketing plans in 1978-79 means that very few, if any marketing themes would likely be on the extension agent's agenda when they meet with farmers. In effect, only a handful of farmers' responses (12 out of 253 valid responses) directly identified marketing issues: Regular purchases of produce by the ORD (five responses), building of warehouse and rural general store in the context of Village Cereal Banks (four responses), problems of crop storage losses (two responses), and food aid (one response).

Clearly, a better indication of the importance of marketing is provided when producers are allowed to express their concerns in an open-ended way. Table 7.1 shows how marketing issues compare with one

Table 7.1

Relative Importance of Marketing Problems Producers Felt the E-ORD Should Pay Attention To

Marketing Issues	Order of Priority			Total	
	First	Second	Third		
	(As Percent of Total Responses)			Number of Responses	Percent
Road improvement	3.6	5.0	5.9	17	20.7
Lower input prices	.8	-	-	2	2.4
Regular purchases of crops	12.2	7.6	5.9	42	51.2
Increase producer prices	2.8	-	-	7	8.5
Sell back to farmers	.4	.8	-	2	2.4
Food aid	1.2	6.7	2.9	12	14.6
Total:	21[a]	20[b]	14.7[c]	82	100.0

Source: 1978-79 Farm Survey entire sample.

[a]253 households cited issues of first priority.

[b]119 households cited issues of second priority.

[c]34 households cited issues of third priority.

another. Despite the seemingly small number of issues related to marketing, it should be noted that not shown here is the fact that taken individually as a first priority producers request that the E-ORD buy regularly farm crops everywhere and anytime after harvest (or that the E-ORD keep its promise of doing so) ranks only second to the demand of more extension agents. (Better servicing of agricultural implements comes third and water supply fourth, all requested by at least seven percent of the producers.)

The previous questions asked to the heads of households were centered on the E-ORD and tried to identify the whole range of problems of interest to producers. Even though the results in Table 7.1 show clearly a number of problems, not all marketing problems have been identified. Hence, an attempt was made to identify the problems and also the suggestions of solutions by producers themselves. But before we analyze the suggested solutions, we will examine farmers' perceptions toward the E-ORD's past marketing campaigns.

7.2.2 Producers' Attitudes Toward Public Intervention in Grain Marketing

From Table 7.1 it appears that one major concern of producers is the availability of regular market outlets. Also from the overview of marketing issues in Upper Volta (Chapter 3), we are aware that public marketing operations have not been very successful. Hence, it is important to get producers' assessments of past and present public interventions in the grain market system.

Questions were asked to determine whether producers knew of and/or participated in previous E-ORD grain marketing operations (mainly in 1974-75 and 1975-76), and whether they would be willing to sell to the

E-ORD if the E-ORD were buying grain in 1978-79 (that is in spite of the ORD's disappointing results in the past). Table 7.2 summarizes producers' answers to these questions.

A sizeable number (380 or 80.5 percent) know of the E-ORD previous marketing campaigns. Few (26.1 percent) of these producers, however, actually sold to the ORD, and still a smaller percentage (26.1) of these producers said they had crops to sell to the E-ORD if it were buying. Conceivably, producers who would not sell to the E-ORD, even if it were buying, might not have had much to sell in 1978-79 anyway (see the patterns of transactions in Chapter 6). However, the large magnitude of the negative responses to the questions shows that it is unlikely. Therefore, these numbers should be of concern to the E-ORD management should it decide (or be allowed) to trade grain again because they suggest that although producers might like to see more public grain purchases, they have lost confidence in the E-ORD capabilities.

It is important that OFNACER, now the only public agency buying grain in the E-ORD, understands why some producers do not sell to its agents, if it wants to better serve producers. Looking at the pattern of answers (by two subsamples of farmers) to this question, the following broad picture emerges from farmers' perceptions: First, OFNACER has limited access to producers; second, many producers think that a somewhat large quantity is required if one wants to sell to OFNACER; and third, a sizeable number of producers had never heard of OFNACER before (see Table 7.3).

OFNACER's limited direct access to producers is well known since the agency has only a handful of buying agents (see Chapter 3). But the fact that the information about the agency's grain purchases is not

Table 7.2

Perceptions of E-ORD Grain Marketing

Answers to Questions	Do you know of E-ORD past marketing campaigns?	You know of E-ORD past purchases, but did you sell to the E-ORD then?	You know of E-ORD past purchases, would you like to sell crops to E-ORD now?	You did not know of E-ORD past purchases, but would you like to sell crops to the E-ORD now?
	(Percent)	(Percent)	(Percent)	(Percent)
Yes	80.5	35.8	26.1	0.0
No	19.5	64.2	73.9	100.0
Total Percent	100.0	100.0	100.0	100.0
(Value cases)	(472)	(380)	(380)	(91)

Source: 1978-79 Farm Survey.

Table 7.3

Major Reasons Why Producers Did Not Sell to OFNACER in 1980

Reasons Given by Producers	Evidence From 1980 Farm Survey		Evidence From 1980 Market Survey	
	Number	Percent	Number	Percent
Too small volume to sell to OFNACER	34	25.4	115	34.3
OFNACER did not come in the area	81	60.4	153	45.7
Never heard of OFNACER	18	12.3	55	16.4
Official prices are too low	1	.7	2	.6
Had not found empty bags	-[b]	-[b]	1	.3
OFNACER doesn't buy my crops[a]	-[b]	-[b]	4	1.2
I was away when OFNACER's agents came	-[b]	-[b]	5	1.5
Total	134[c]	100.0	335[d]	100.0

Source: 1980 Marketing Investigation.

[a]Other crops than millet-sorghum, maize, and cowpeas.

[b]Reasons not stressed by the heads of households of the 1980 Farm Survey.

[c]From 157 households' valid answers, 146 had not sold to OFNACER. However, 134 provided valid reasons why they did not sell.

[d]From 409 households' valid answers, 352 households had not sold to OFNACER. However, 335 provided valid reasons why they had not sold.

that widely circulated in the area shows that OFNACER impact is very limited. In addition, the latter observation suggests that other marketing information, on prices, supply and demand conditions, may be poorly circulated as well. Producers also believe that OFNACER prefers to buy the larger quantities grain merchants have bulked for resale rather than the smaller quantities individual producers bring to the marketplaces (see Chapter 5).

The latter proposition could have been the object of more empirical testing had the 1978-79 farm survey: (1) distinguished among the location (market/elsewhere) of transactions; and (2) made a clear distinction among the marketing participants on the basis of the typology of Chapter 5. As it turned out both features were overlooked by the survey, which makes the comparison between OFNACER and merchants' market shares very difficult.[1]

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[1]One may still want to have an idea about OFNACER's market share as compared to all other categories of first handlers (including merchants, their agents, and rural residents). OFNACER market share in the E-ORD may be estimated in one of two ways. First, an aggregate figure for all zones of the E-ORD, regardless of whether OFNACER intervened, is of primary concern to macro policy. But second, a figure computed only for the areas and periods where and when OFNACER operates is a better indicator of OFNACER's performance in direct competition with other handlers. (OFNACER intervenes only in selected zones and the 1978-79 farm survey was not designed to be representative of OFNACER's activities.)

To compute the seconf figure, we selected a subsample in which only the periods (from October 15 to April 1) and the villages (from which at least one household had sold to OFNACER) when and where OFNACER would have intervened. The purpose of such an ad hoc and ex-post quasi experimental design is to try to pair households who sold to OFNACER against a control group of farmers who had not, and to help through this pairing control for the area heterogeneity.

The results of such computations show that OFNACER's share of producers' farm grain sales (which hovers around 20 percent) is very small. But OFNACER's aggregate share of farmers' purchases which hovers around 3 percent is even smaller (see Appendix N on market shares).

7.2.3 Producers' Suggested Solutions

From the reading of some of the problems identified, one may infer some of farmers' perceived solutions. Unfortunately, not all such problems contain implicitly their solutions. Furthermore producers surveyed in the farm surveys have somehow acquired a better awareness of the E-ORD (through the numerous interviews) and thus may have a different appreciation of the role of the ORD. In addition, these producers are heads of households and may have different concerns than other members. For these reasons, questions regarding producers' suggestions for the improvement of the market performance were asked to two groups of farmers. One is made up of the heads of households of the 1980 farm survey, the other is made up of a more diversified group of producers interviewed at key marketplaces.

Table 7.4 summarizes the answers of these two groups of producers to the question of marketing improvement. The responses show the same main problems identified previously (bad road system and inconsistent purchase policy). They suggest also that the heads of households and farmers interviewed at the marketplaces have different priorities. Of particular interest in this difference are the suggestions regarding the standardization of measures and the need to delay crop sales until prices rise, both suggestions favored more by producers inverviewed at marketplaces than heads of households. This difference may be attributed to the level of responsibility and the kind of experience of the two groups. On the average, the heads of households have more responsibility than other groups of producers, and in addition they may have more grain to sell which could indicate a different approach to the issues of standardized measures.

Table 7.4

Producers' Suggestions for the Improvement of
The Performance of the Marketing System

	1980 Farm Survey		1980 Market Survey	
	Answers	Percent	Answers	Percent
Improve roads	36	37.1	6	3.4
Provide official buying agents	20	20.6	25	14.2
Impose standardized units	3	3.1	47	26.7
Increase official prices	17	17.5	31	17.6
Provide advice and information	7	7.2	8	4.5
Provide credit to buy grain	2	2.1	6	3.4
Tighten control on merchants	2	2.1	3	1.7
Attract more merchants in area	5	5.1	4	2.3
Improve market facilities	2	2.1	-	-
Need to store grain and wait for higher prices	3	3.1	46	26.1
	97	100.0	176	99.9[a]
Don't know	39	-	211	-

Source: 1980 Farm and Market Surveys.

[a]Total percents do not add up to 100 because of rounding errors.

These interpretations must be regarded with caution, however. Given the large number of producers who had no suggestions (a much larger number than that of respondents in the case of producers interviewed at marketplaces) they are only tentative.

7.2.4 Problem Diagnosis

In summing up the analysis of producers' marketing problems, we need to determine, to the extent possible, whether producers' perceptions are supported by the available empirical evidence.

It appears clearly from the farm survey results, and it is of common knowledge, that there is very little emphasis on marketing issues by the extension agents. The farm survey results also show that producers do not trust anymore the marketing capabilities of the E-ORD management, which is a reflection of E-ORD past failures. Yet, there seems to be a demand for official buying agents. This demand may be due to two related factors. First, many farmers interviewed by (what they perceived as) public officials may tend to emphasize the help that public agencies may provide. Second, many farmers are either still unaware of OFNACER's existence or see that OFNACER agents prefer to buy from merchants when possible, which is supported by the fact that OFNACER intervenes only in selected areas, at selected times, and is able to buy directly only some 20 percent of farm grain sales in the areas mentioned.

More generally it is clear that farmers are expressing a genuine need for the access to secure markets to sell or purchase products, through road improvement and attraction of more buyers (official or private) to their region. It does appear that a great deal (60 percent) of the farm grain is sold and the grain for domestic use is bought at

distances of 10 kilometers or more from the farm compound (see Appendix O: Sales and Purchases at Distances from the Village). Unfortunately, unambiguous estimates of first and last handlers' participation in these sales and purchases cannot be provided.

The interpretation of producers' perceptions of official prices is also difficult. On one hand, very few producers who did not sell to OFNACER in 1980 mentioned that official prices are lower than merchants' prices. On the other hand, relatively more producers thought that low official prices is an important dimension of the performance of the marketing system. There is no available market prices series to resolve this issue. But on the basis of farm gate prices (see Chapter 6) it would not appear that at the time OFNACER intervenes official prices are lower than prices received by producers. Thus, farmers who mentioned that official prices are low may have been mistaken, which suggests again that they lack accurate market information.

Other problems referred to throughout the analysis of producers' perceptions and suggestions relate to credit in order to buy and store grain, the building of warehouse and general store, and grain measurement. These problems are also of particular interest to public officials because they had set in motion Village Cereal Banks to provide credit and food security. Public officials are also interested in promoting better grades and measures. These issues are the subjects of the next sections.

7.3 Measurement of Farm Crops

7.3.1 Issues and Hypotheses

"The standardization of market weights, qualities, and practices is so widespread (in developed countries) that it is taken for granted, and the role of standardization in the market process is sometimes unappreciated." (Kohls and Uhl, 1980, p. 360). Grading and standardization[2] facilitate price discovery and benefit producers, traders, and consumers in several ways. First, the use of grades and standards enable the buyers to obtain the particular qualities of produces they desire. Second, it encourages the production and marketing of a better quality product. Third, it decreases transaction costs by eliminating the need for personal inspection. Fourth, it reduces logistical costs by sorting high quality products suitable for storage and by facilitating consolidation shipments of homogeneous products. Fifth, it imporves equity to individual producers, sellers, and consumers by reducing the potential cheating in trade. Finally, it facilitates the exchange of market information and helps maintain effective competition by providing a common language for buyers, sellers, and market reporters.

Grades and standards are not well articulated in Upper Volta in general and in E-ORD in particular. A great number of varieties of millet and sorghum are distinguished throughout the region on the basis of consumers' preferences and agronomic qualities. Yet there is a good deal of pooling locally. This is of great significance to the cost

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[2]Grading is the sorting of products into homogeneous lots, according to characteristics or grade specification that might include physical as well as subjective factors. Standardization is the process establishing one set of grades among buyers and sellers, and it involves defining weights and measures and indication of quality.

of personal inspection when the volume exchanged is large, as it is at the wholesale level. However, the demand for grain grading is not strongly articulated and public officials have not provided any grading system except in vague terms for rice.[3]

There is also a great deal of diversity in grain measurement. For example, the 1978-79 farm survey recorded some 50 different containers used by producers to store and/or measure grain. Some of the devices are officially accepted: The so-called ORD "tine" is a calibrated 20-liter container sturdily constructed to prevent losing shape and thus volume tampering (a half unit is also available), the jute bag is usually of approximately 100 kg., but is also available in 50 kg. or even 25 kg. versions, and there is also the scale. But a larger number of these devices are not standardized. The so-called merchant's (or local) "tine" is a nonstandardized unit made often from used oil drums of very light construction, and thus easily reshaped in somewhat smaller or larger volumes. Market participants also use a whole array of plates, the most popular being the "Yoruba plate," so-called because it is sold by Yoruba women from Nigeria or Benin, as many kitchenwares are. Finally, market participants may also use baskets or calabash, the most popular being the small louche (calabash), which volume varies according to participants (merchant or producer) and season, and yet is always quoted for the same face value of five FCFA.

The ORDs and OFNACER have sought to promote the ORD tine in order to: (1) make the handling of produces during transaction more efficient;

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[3]For example, millet and sorghum are treated by OFNACER as if they were one product. This thesis does the same, but only because, in most instances, the data on the basis of which the analysis is performed do not distinguish between millet and sorghum. Furthermore, such treatment is consistent with previous analysis performed upon the same data set.

(2) help prevent possible wrongdoing by grain assemblers and retailers who may be tempted to buy from one local tine, but sell from a smaller one just by reshaping or changing the device; and (3) make the collection, dissemination, and monitoring of prices meaningful and easier.

The concern about grain assemblers' wrongdoing stems from the way food grain is measured. When the tine is used, it is filled up above the rim until a cone of grain (called the "hat") is formed and stabilized on top (that is, until the cone cannot retain any more grain). This "hat" is considered a volume discount. The ORDs and OFNACER want to get rid of this practice; unfortunately, sometimes their agents themselves--as the author observed--use the same practice. (The "hat" of grain, would say the agent, is for his chicken.) This has become one of the ways OFNACER and ORD agents take advantage of both their agencies and the producers, just as licensed traders allegedly do. When the small calabash (louche) is used, the assembler holds the device with his thumb and forefinger and attempts to take more grain in the craddle of his palm as he scoops the grain from the producer's container into his. Yet, even though they may be in a position to take advantage of the measurement, many traders would rather use a larger device like the tine to speed up the transaction and move quickly to the next patron. They claim that in the Namounou and Diapaga areas, where the louche is predominantly used, producers refuse any other device when they sell their produce.

The analysis focuses particular attention on producers and attempts to determine whether producers usually measure (using devices similar to grain assemblers) the produce on the farm when they plan on selling at the market, why they think they have to do so or not, what possible

effect measuring on the farm has on the perceived fairness of the market transaction, and which devices they would like to see and why. On the basis of the available information the analysis attempts to infer whether the authorities' campaign to promote the ORD tine is taking hold among producers, and it also attempts to estimate the price spread that results from the different devices assemblers and producers use.

The analysis is based on the results of the 1980 farm and market surveys. In general, farmers of the first group (heads of farm households) interviewed at the farm, were asked what they usually did, while farmers in the second group (heads and other members of farm household), interviewed at selected markets, were asked what they did on that particular market day. Despite the ability of the well-trained enumerators, many farmers of the second group who have never been exposed to interviews before (contrary to the heads of households in the first group), lost their patience or got afraid of the many questions asked and did not respond to all questions. This results in numerous missing cases, the bias of which cannot be determined, but the sampling design has emphasized a better knowledge of farmers' marketing problems rather than statistical rigour.

7.3.2 Measurement on the Farm

Most heads of households (1980 farm survey) said they usually measure the grain at the farm[4] when they plan at selling at the market, and only 20 percent said they did not. Producers primarily measure on the farm to determine precisely the quantity which helps them estimate

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[4]Of course, when producers sell on the farm some measure is performed. This measure, however, is not planned except possibly when the producers are forewarned on the buyer coming to the village.

the sale value to be expected on the basis of some price expectation. A secondary reason is specifically to guard against any measurement tricks of the assembler. The reasons for not measuring include the lack of the proper measurement device, the fact that they trust the family member they send to the market to sell the product on their behalf, the fact that assemblers impose their measures at the market, and also the fact that very small quantities don't require any measurement (see Table 7.5).

If most heads of households have stated that they usually measure grain on the farm before market sales, almost half (47.4 percent) of producers interviewed at key marketplaces (and providing valid answers) had not actually measured their products at the farm prior to the market visit.[5] In particular, only 36.8 percent of producers who brought sorghum-millet for sale had actually measured the grain on the farm. If anything, the evidence from the 1980 market survey raises the possibility that a small proportion of the diversified group of farmers attending markets actually measure grain on the farm, contrary to heads of households. But is there any relationship between grain measurement on farm and perceived market fairness?

7.3.3 Measurement by Producers on Farm and Perceived Market Fairness

Two proxies for market fairness are used; one is the percentage of farmers who said they usually received at the market the value expected for their crops, and the other is the difference between the value expected and that actually received for farmers who had sold all the grain they brought for sale.

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[5] 152 farmers, among 296 millet-sorghum sellers, provided valid answers.

Table 7.5

Frequency and Reasons for Grain Measurement

7.5a Do Producers Measure Grain at the Farm Before Market Sale?

Answer	Number	Percent
Yes	105	79.5
No	27	20.5
Total[a]	131	100.0

Source: 1980 Farm Survey.

[a]Missing cases: 14.

Table 7.5b Reasons Why Households Usually Do Not Measure at the Farm .

Reasons they do	Percent	Reasons they don't	Percent
To estimate sale value	78.6	Do not possess a tine	37.5
To guard against tricks[a]	20.4	Trust in parent[b]	31.3
Traders require it	1.0	Traders impose their measure	25.0
	100.0	Quantity for sale is too small	6.2
			100.0
Number of cases	103	Number of cases	16

Source: 1980 Farm Survey.

[a]Grain assemblers' measurement tricks.

[b]Parent or member of household sent to sell grain on behalf of household.

The results of the 1980 farm survey suggest that heads of households have a favorable perception of the market fairness which does not depend on whether they usually measure on the farm or not. Also, the heads of households see only one of two reasons why they may not get the value expected at the market and the test results do not suggest any significant impact due to measure of product on the farm (see Table 7.6). Thus, on the basis of the responses from the heads of households, only a minority of farmers find the market (and assemblers) unfair as far as expectation about the value of products brought to market is concerned.

The evidence from farmers interviewed at marketplaces is not that clear cut, however. Millet and sorghum sellers who had measured on the farm expected a significantly higher value for their sales than farmers who had not. But the perceived gap between the expected and actual values is only marginally (.01 significance level) significant for the two subgroups. This is partly because, although measuring farmers had significant higher expectations than nonmeasuring ones, both subgroups of farmers did not receive that significantly different actual value for their products (see Table 7.7). Table 7.7 also suggests that nonmeasuring farmers, on average, received more than expected, while those who had measured thought they were short of FCFA 217. Hence, on the basis of responses of farmers interviewed at marketplaces one may put forward the hypothesis that measuring on the farm actually raised expectations as to market value anticipated which possibly translates into perception of market unfairness.

One needs, however, to put forward such a hypothesis very cautiously. It contradicts the perceptions of the heads of households and we lack information about various farmers' price expectations (see Table

Table 7.6

Measure of Produce on the Farm and Perceived Market Fairness (Chi-Square Tests)

Perceived Market Fairness and Causes	Measure	Don't Measure	Total Sample	
	Percent	Percent	Percent	Cases
Market Fairness[a]				
Usually get at least what expected	80.5	65.0	78.0	96
Usually get less than expected	19.5	35.0	22.0	27
	100.0	100.0	100.0	123
Reasons for getting less than expected[b]				
Lower prices than expected	45.0	57.1	48.1	13
Assemblers cheat	55.0	42.9	51.9	14
	100.0	100.0	100.0	27

Source: 1980 Farm Survey.

[a]Chi-square is 2.7907 with 2 degrees of freedom and significance level of .2477

[b]Chi-square is .01298 with 2 degrees of freedom and significance level of .9093.

Table 7.7

Measure on the Farm and Perceived Market Fairness
(T-Tests of Grain Values Expected, Actually Received, and Differential)

	T-Test on Expected Values For Farmers Who		T-Test on Actual Values For Farmers Who		T-Test on Value Differential For Farmers Who	
	Had Measured	Had Not	Had Measured	Had Not	Had Measured	Had Not
Number of cases	89	60	89	60	89	60
Mean (CFA Francs)	1794.6	1077.5	1577.0	1112.4	(+)217.6	(-)34.9[c]
T-Statistics	2.40[a]		1.78[a]		2.27[a]	
Significance level	.009[b]		.039[b]		.0125[b]	

Source: 1980 Market Survey.

[a]T-value on pooled variance.

[b]One-tail probability.

[c]The negative value indicates that farmers received more than expected.

7.6). It may simply be that farmers interviewed at the marketplace had a poorer knowledge of actual market prices than heads of households, which explains why some farmers would think they got more than expected.

7.3.4 Farmers' Preferences for Measuring Devices

Equity in grain measurement is but one dimension of grain measurement. The 1980 surveys also sought to determine which measuring devices producers would like to see in use and why. Not surprisingly, all measuring devices chosen were those already in use and tested by participants. That would not mean that new devices would not be accepted; these alternative measuring devices would have to respond to producers' needs, however.

Table 7.8 shows the reasons why heads of households (1980 farm survey) and farmers interviewed at marketplaces choose measuring devices. The most striking difference between these two groups of farmers is that the heads of households show a much stronger preference for the ORD tine than households interviewed at marketplaces. Thus, it appears the heads of households have paid heed to the promotional campaigns of OFNACER and the E-ORD. As for the producers interviewed at marketplaces, their choice of measuring devices may reflect the fact that these devices are the ones used by merchants. (No trader uses the ORD tine at markets and heads of households may be measuring at home at relatively higher numbers than producers attending markets.)

Both subsamples of producers are more in agreement with the reasons of preferences. They chose one measuring device for three main reasons: (1) they trust its fairness; (2) they value its convenience; and (3) they appreciate its wide usage in their areas.

Table 7.8

Reasons of Preference for Measurement Devices

Table 7.8a Heads of Household (1980 Farm Survey)

Reasons of Preference	By HH's Who Measure	By HH's Who Don't Measure	By Entire Sample	By Devices					
				Calabash	OR's Tine	Local Tine	100 Kg. Bag	Yoruba Plate	Scale
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Area-wide use	16.2	28.6	18.3	50.0	5.3	10.3	-	54.3	-
Farmer owns one	5.1	0.0	4.2	-	10.5	2.6	-	-	-
Convenience	12.1	14.3	15.5	-	-	20.0	53.8	6.5	-
Petty sales	6.1	9.5	6.7	-	-	7.7	-	16.1	-
Trust	51.5	42.9	50.0	50.0	57.9	59.0	38.5	22.6	100.0
It's official	9.1	4.8	8.3	-	26.3	-	7.7	-	-
Total percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
cases[a]	99	21	126	2	38	39	13	31	3

Source: 1980 farm survey.

[a]The subtotals do not add up to the grand total because of missing cases.

Table 7.8

Continued

Table 7.8b Farmers Interviewed at Selected Marketplaces

Reasons of Preferences	By Those Who Had Measured	By Those Who Had Not Measured	By the Following Devices						
			Whole Sample	Small Calabash	ORD Tine	Local Tine	100 Kg. Bag	Yoruba Plate	Scale
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Area-wide use	18.5	22.4	21.0	29.0	-	6.3	-	44.9	-
Farmer owns one	16.0	-	7.2	2.5	-	17.5	-	2.0	-
Convenience	14.8	15.3	14.9	-	-	33.3	12.5	20.4	-
Petty sales	11.1	14.3	12.7	27.5	-	3.2	-	20.4	-
Trust	39.5	48.0	44.2	40.0	100.0	39.7	87.5	26.5	100.0
It's official	-	-	-	-	-	-	-	-	-
Total percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
valid cases[a]	81	98	287	40	1	63	24	49	3

Source: 1980 market survey.

[a]The subtotals do not add up to the grand total because of missing cases.

Only a few heads of households (8.3 percent) chose a measuring device because it is the official one,while a sizeable proportion of producers interviewed at market (12.7 percent) would like a device to handle their small-scale transactions. Again, the fact that heads of households think of official measuring devices is indicative of the fact they are aware of the ORD's campaign. In contrast, producers who attend markets often bring small quantities for which a small-scale measuring device is very appreciated (see Table 7.8).

The fact that more than one-fourth of those who chose the ORD tine did so because that was the official unit is very encouraging for the ORD promotion campaign to spread the use of that unit; very few producers, however, chose the scale, and even though they did so because of trust, we are aware that most farmers simply do not know how to operate it. Table 7.8 and other previous empirical evidence suggest that the more diversed group of farmers who visit marketplaces may have a different pattern of behavior with respect to measurement devices than the group of heads of households.

7.3.5 Price and Volume Differential Related to Measuring Devices

There is no doubt that the nonuse of standardized measurement devices leads to imprecisions regarding the volume being bought and sold, and may encourage some form of cheating by persons doing the measurement. For example, grain traders who sell back to OFNACER complain that a "100 kg." bag filled to the limit as requested by OFNACER, who does not weight it in the presence of the merchant, may weigh some 18 to 20 percent in excess of 100 kg. They content the OFNACER agent later repackages the bag into 100 kg. units and saves the difference

for personal use. An estimate of the quantity of price differential, however, is difficult to determine because of thw unwillingness of most merchants to allow any measure of the capacity of the devices they use.

At the Namounou Marketplace we attempted to estimate the quantity differential between the merchants' calabash (louche) and the producers'. Even though Namounou is the region's largest rural market, male and female producers insist on selling by the louche (small calabash). They would compare their own louche with the merchants', and if not satisfied, may go to the next grain assembler or attempt to retail their product. In the latter case, they do the measurement. It was an estimate of such a volume differential between the traders' and the producers' louche that we attempted to measure in conducting an experiment at the Namounou Market on February 17, 1980.

A sample of 12 grain assemblers and 12 producers willing to participate was taken. One hundred FCFA worth of grain was weighed for both groups. (Even though the louche is quoted for FCFA 5, FCFA 100 worth of product is made up of 27 louches and not 25 because of a volume "discount.")

The results indicate that an average FCFA 100 worth of sorghum measured by the traders weigh 34 percent heavier (at 3.07 kg.) than the same retailed by producers-retailers (at 2.25 kg.). Assemblers on the average bought sorghum at FCFA 33.22 per kg., while farmers, who decided to sell it themselves to consumers, were selling it at FCFA 44.44 per kg.

Of course, some portion of these differentials is necessary to cover different marketing costs involved in wholesale and retail trade. At a minimum, the differentials do represent the opportunity cost of

producers' time spent in trying to retail their products rather than selling it more quickly to traders. When assmblers sell back the grain they have purchased from farmers, they must charge higher prices to cover their operational costs and normal profit levels. Unfortunately, in our analysis we have no way of determining the degree to which the price differentials are justified on the basis of the differential marketing costs.

7.3.6 Synthesis

The empirical evidence presented shows that heads of households with more responsibility may have a different pattern of behavior with respect to measurement as compared to a more diversed group of farmers (some retailing their products) visiting marketplaces. The heads of households tend to measure their grain before taking it to market, while it seems a smaller percentage of producers interviewed on market actually did. While heads of households, regardless of whether they measured on farm, thought they were treated fairly at marketplaces, average producers interviewed at markets had higher expectations about the value of their products when they had measured at home than otherwise. The effects of possible different price expectations could not be determined, however.

Heads of households who have been having contact with ORD agents, seem to be more aware of the official ORD tine than producers interviewed at markets. Both groups would prefer a measuring device which is trustworthy, convenient, and in wide use. At Namounou it was found that the louche merchants use to buy from producers is significantly larger than the louche producers would prefer to use. This differential

partially represents producers' time opportunity spent to retail own product and accounts for traders' operating costs and normal profits.

In conclusion, it appears clear that producers are aware of the benefits of standardized measures. However, the promotion of the ORD tine and other standardized units, with the possible exception of the 100 kg. bag, is not taking hold fast enough. ORD and OFNACER should step up their promotion campaign by: (1) holding demonstrations showing the usefulness and superiority of the ORD tine over its nonofficial alternative; (2) providing new containers which respond to the expectations of producers (e.g., subunits of tine); and (3) devising ways to enforce the use of standard measures by all participants.

7.4 Marketing Credit and Advanced Grain Sales

7.4.1 The Issues

Credit transactions cover many dimensions[6] in the rural economy of the Eastern Region but those between producers and merchants are of particular interest because of the public perception of producers being exploited. Producers may borrow money, or buy food grain on credit, before harvest against the promise of payment in grain at harvesttime. In both cases, the quantities of the future grain[7] deliveries are

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[6] See Tapsoba, 1981.

[7] Repayment in kind may involve other crops than millet-sorghum (in some cases even animals). The pattern follows regional differences: for example, in the peanut growing area of Bogande, the primary crop sold in advance is peanuts. We have evidence that in the Pama area yam producers commonly sell their crops before they mature or even before they plant them. The contract, which may affect a portion or the whole field, calls for the producer to care for the yams until harvesttime. (The latter is a genuine case of "green sales").

determined on the basis of the amount of money or food borrowed and a preharvest food grain price is in effect set up. The pledging of part of future harvest grain as collateral for a loan is not a "green sale," but an advanced sale[8] and may be conceived as a preharvest contractual arrangement between producers and merchants. But, it is thought that this type of arrangement favors only merchants who are provided with an opportunity to secure, some three to six months before harvest, grain supplies at prices even lower than the depressed harvest prices, while locking producers into a vicious circle of indebtedness.

The questions confronting us are: (1) How widespread the practice is in the E-ORD? (2) What is its magnitude for the producers who are concerned? (3) What ranges of prices and quantities of grain in repayment are agreed upon? And (4) What annual nominal interest rates these prices and repayments in kind imply? These questions are difficult to investigate in the Eastern Region because first, money or food grain borrowing is socially perceived as an inability on the part of the borrower to feed his family on his own, so that farmers may hide or underreport the extent of their borrowings. Second, because they have been depicted as userers, merchants don't easily admit that they buy crops in advance, while some even say that the practice goes against their religious beliefs. Finally, it is often difficult to determine who the lender is; the merchant, the merchant's agents, and village resident buyers working on behalf of the merchant, or even some farmers no longer feeling a bond to help their fellow farmers the way they formerly did and requesting an interest payment when fellow farmers pay back a loan.

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[8]A "green sales" arrangement assumes that the future production of an entire field has been sold. Here we use the term for convenience.

Because of these difficulties, the analysis relies on different sources of information: 1) the 1978-79 farm survey has recorded the credit transactions of heads of households over the year -- a comprehensive analysis of this data is provided by Tapsoba[9] and this analysis makes use of some of his results already published; (2) the 1980 farm and market surveys focused on the pattern of advanced sales by heads of households and a more diversified group of farmers interviewed at the markets; (3) the comprehensive 1980 village inventory survey focused on the magnitude of "green sales" on a village basis; (4) finally, we will also rely on personal communications.

7.4.2 E-ORD Areas with Advanced Grain Sales

The results of the 1980 village inventory survey show that in 12 percent of the villages visited regularly by grain merchants, part of the grain is bought in advance or "in green" (see Table 7.9). These villages are located in all sectors of the ORD except Diabo, Comin Yanga, and Matiacoali. The evidence from the 1980 market survey (in selected marketplaces) shows also that producers who sold in "green" that year came from 19 out of the 126 villages (15.0 percent), and that 63.2 percent of these villages were located in the Bogande sector, 21.0 percent in Fada, 10.5 percent in Pama, and 5.3 percent in Diapaga. As for the 1980 farm survey, producers acknowledged that they knew of the practice taking place at 19 out of the 27 villages surveyed, which is similar to

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[9] Tapsoba has covered this point in his analysis of the "commercial segment of the informal credit system" (1981, pp. 193-210).

Table 7.9

Village Locations Where Merchants Usually Buy Millet-Sorghum in Green

ORD Secteurs	Villages visited by merchants	Villages where part of the grain was brought in 'green'	
	#	#	Percent
1. Bogande	69	10	14
2. Diabo	2	0	0
3. Diapaga	21	2	10
4. Comin Yanga	3	0	0
5. Fada	26	3	12
6. Kantchari	5	1	20
7. Matiacoali	11	0	0
8. Pama	6	1	17
	142	17	12

Source: 1980 Village Inventory Survey.

the results of the 1978-79 survey. Thus, the general impression conveyed by the various sources of information is that advanced sales of some sort takes place all across the E-ORD.

7.4.3 The Magnitude of Advanced Grain Sales

The question now is how important are advanced sales for producers and lenders? The results of the 1980 farm survey identified only 13 heads of households who had sold part of their grain in "green" that year, and a total of 21 heads of households who had done so at least once the past three years. Only 35 (7.6 percent of) such farmers were identified in the 1980 market survey (13.3 percent of all farmers did not answer the question). Thus, it would seem that there is a small number (possibly due to underreporting) who sell in "green."

The results of the 1978-79 credit analysis support this conclusion with the same qualifications (see Tapsoba, 1981, p. 205). Only sixteen (16) loans which called for repayment in grain with interest were recorded, with an average of 67.7 kg. of grain paid back. From the lender's side, however, 37 loans paid back in grain (an average of 102.6 kgs.) were extended by heads of households.[10] Also from the record of advanced sale transactions provided by one grain merchant in Piela, 12 farmers were interested in the scheme which involved an average of 4.83 local tines (or approximately 91.77 kg.) of grain to be delivered at harvest by producers. (For the grain merchant, that we classify as a regional wholesaler or a medium to large trader, the total quantity to be

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[10] We have assumed here that these "commercial loans" have been extended mainly by grain merchants (some being grain producers themselves), or by their agents.

collected, approximately 1,102 kg., represented only 5 percent of his grain transactions.) Finally, the grain flow analysis (See Chapter 6) shows that the amount of grain used to pay back loans is smaller than that given away as gifts.

7.4.4 Some Patterns Related to Advanced Sales

Most heads of households with advanced sales interviewed in the 1980 farm survey usually deal with one trader at a time, while only a few (25 percent) with two traders, and only 30 percent of the households would label this merchant their "regular" or exclusive partner. Also, very few (10.5 percent) producers go to another village to borrow money in exchange of future grain deliveries at harvest (see Table 7.10). We infer first that this kind of transaction is confined to the premises of the village, and second, from the producer's point of view, the grain merchant has not secured an exclusive source of supply because of his money-lending.

Sometimes producers may not get the entire amount of money or food grain they wanted to borrow. A third or so of the heads of households in the 1980 farm survey have faced such a possibility. This happens when the merchant says he cannot fulfill the credit demand or, reason the heads of households, the merchant is afraid that the borrower may not pay back the entire loan (see Table 7.10). Thus, it appears that the merchants are cautious not to overlend money, or more accurately, not to attempt to buy too much of farmers' harvest, for fear farmers would have difficulties to pay back. (We will see later that this possibility still occurs.)

Table 7.10

Producers' Transaction Patterns Related to Green Sales of Grain

Answers	Borrow from only one source	Is merchant a regular buyer	Borrow outside village	Usually get all cash loan	Usually get all grain	Usually get/receive gifts
	Percent	Percent	Percent	Percent	Percent	Percent
Yes	75.0	30.0	10.5	68.4	66.7	0.0
No	25.0	70.0	89.5	31.6	33.3	100.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number of cases	20	20	19	19	18	13
(Missing cases)	(1)	(1)	(2)	(2)	(3)	(8)

Source: 1980 Farm Survey.

For most heads of households (70 percent), the period of July-August is the time when they engage in "green" sales; for 25 percent it is May-June; and for 5 percent it is September-October. Money is borrowed during these periods to buy food--from either another trader or a fellow farmer, (61.9 percent of the answers), to pay for celebrations (9.5 percent), or to buy consumer goods (28.6 percent). As for food grain purchased on credit, all heads of households do it in July-August.[11]

As already explained, the amount of grain to be delivered at harvesttime is calculated on the basis of the loan or food grain borrowed during the hungry season. In the case of a loan, a price (by local tine) is agreed upon, and in a case of food grain borrowed, the exchange rate is in terms of local tines to be reimbursed for one borrowed. These prices and the resulting interest rates are the main concerns of public officials. Next section summarizes the results of the 1978-79 credit data, and the insights that the 1980 farm survey provide.

7.4.5 Grain Prices in Advanced Sales

The heads of households in the 1980 farm survey were asked to quote prices per local tine that merchants usually set for the loan in May-June, July-August, and September-October. In addition, they were asked the number of local tines of grain they usually pay back for 6 local tines borrowed in the same periods. These quotes are provided by 37[12]

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[11]Based on answers of 21 households who borrowed from merchants at least once in the last three years, 1980 farm survey data.

[12]Actually, the total number of "knowledgeable" heads of households is 56 in the 1980 farm survey, among whom 21 had green sales at least once in the last three years. Only 37, however, provided valid answers to the questions above.

heads of households who acknowledged that they know of the practice of green sales, among whom only four had actually sold grain that way at least once in the last three years.

Table 7.11 shows the price quotes aggregated across periods and sectors. FCFA 250 per tine (≈ 13.16 FCFA/kg.) is the most quoted price while the 95 percent confidence interval on the mean (FCFA 323.98) is FCFA 300 to FCFA 350. The analysis of variance, to the extent that it is warranted owing to the number of missing cases, suggests that these prices do not vary significantly over the periods, but vary across the four sectors. This pattern may suggest that prices may be somewhat institutionalized in the different areas the practice takes place.

The average of the price quote (17.1 FCFA/kg.) is very low compared to the official price of 40 FCFA/kg.,[13] but it is closer to the lowest farm gate price received at harvest of 27.8 FCFA/kg. (see Chapter 6). The records of advanced sales transactions of one grain trader reports a more generous price of FCFA 500 per tine (26.32 FCFA/kg.). Also, the fact that among farmers quoting prices only four farmers had actually had advanced sales introduces some potential for underestimation due to merchant bias.

Thus, when compared to the official harvest price, advance sale prices appear very low, hence, justifying public conern. However, these advance sale prices are not that low when compared to actual harvest prices in the region. The price quoted in advance sale is discounted

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[13]The average harvest price computed from the quotes of the same producers is FCFA 521.25 a "tine," that is, approximately 27.3 FCFA/kg. It can also be seen the average actual harvest price is less than the official price, but almost identical to the lowest farm gate price derived in Chapter 6.

Table 7.11

Price Quotes for Advanced Sales of Millet-Sorghum
Aggregated Across Zones and Periods

FCFA per tine	FCFA per kg.[a]	Frequency (Percent)[b]	Cumulative Frequency
200	10.53	3.1	3.1
250	13.16	35.7	38.8
300	15.79	18.4	57.1
350	18.42	22.4	79.6
400	21.05	8.2	87.8
500	26.32	11.2	99.0
600	31.58	1.0	100.0

Source: 1980 Farm Survey.

[a]A local tine with "hat" weighs approximately 19 kgs.

[b]Number of cases 98.

by the merchant and includes an interest and risk charge for the amount of money loaned. When everything is netted out, this price may not appear as low.

As for the exchange rate in kind, 80 percent of the heads of households quoted 12 tines for six tines, that is a two for one ratio (see Table 7.12). However, a few producers still maintain that no interest is charged by merchants; that is, six tines borrowed are paid back by six tines. Also many knowledgeable participants we talked to referred to nine tines for six, that is, a three to two ratio, as a more common exchange rate than Table 7.12 would indicate. The tests on the variability of the quantity quotes show no effect of periods or sector. Therefore, we are tempted to infer that the two to one ratio is an accepted benchmark ratio of repayment in kind in the region.

7.4.6 Inputed Nominal Interest Rate of Marketing Credit

The prices and exchange rates are only one dimension of the issue of advanced sales; the nominal interest rate that results from these prices is a second one. Estimates of the nominal annual interest rates actually charged by traders in relation to advanced sales are difficult to generate because of: (1) the imprecision as to the length of time involved; (2) the imprecision regarding prices in the preharvest season and at harvest; and (3) whether we consider the borrower or the merchant side in light of the fact that producers may default on their loans.

Table 7.13 shows the inputed interest rates on actual cash borrowing and loan transactions recorded in the 1978-79 farm survey (entire sample). Table 7.13a represents the producer-borrower side while Table 7.13b represents the producer-lender side. It appears that the inputed nominal

Table 7.12

Exchange Rate Quotes for Repayment of Food Grain Bought on Credit in the Hungry Season

Items	Number of tines paid back for six tines bought					Total
	6	7	8	9	12	
Number of quotes	3	9	5	6	80	103
Percent	2.9	8.7	4.9	5.8	77.7	100.0

Source: 1980 Farm Survey:

[a]Missing cases: 8.

Table 7.13

Advanced Sale Prices and Nominal Annual Interest Rates

Table 7.13a Actual Borrowing

Zones (1)	Sum borrowed (FCFA) (2)	Grain paid back (kgs.) (3)	Green sale price (FCFA/kg) (4)[a]	Harvest price (FCFA/kg)[d] (5)	Value of repayment (FCFA) (6)[b]	Repayment period (days) (7)	Annual interest rate (%) (8)[c]
Bogande	1,000	74	13.5	40	2,960	42	1680.0
	1,000	37	27.0	40	1,480	49	352.6
Mani	1,000	38	26.3	40	1,520	161	116.4
	2,500	74	33.8	40	2,960	182	36.0
Logobou	500	19	26.3	32	608	161	48.0
Partiaga	2,250	101	22.3	36	3,636	154	144.0
	2,000	101	19.8	31	3,131	91	223.2
	4,000	202	19.8	35	7,070	35	788.4
Ougarou	1,500	95	15.8	26	2,470	112	208.8
	1,000	38	26.3	26	988	203	-2.4
	600	38	15.8	51	1,938	154	520.0
	300	19	15.8	26	494	140	164.4
	300	19	15.8	26	494	119	193.2
	1,200	76	15.8	26	1,776	168	136.8
	500	38	13.2	26	988	91	385.2
Pama	3,000	114	26.3	27	3,078	91	10.8

Source: adapted from Tapsoba (1981): 1978-79 farm survey.

[a] (2)/(3)

[b] (3)*(5)

[c] $\frac{(6)-(2)}{(2)} * \frac{360}{(7)} * 100$

Table 7.13

Continued

Table 7.13b Actual Lending

Zones	Sum lent (FCFA)	Grain received (kgs.)	Green sale price (FCFA/kg)	Harvest price (FCFA/kg)	Value of repayment (FCFA)	Repayment period (days)	Annual interest rate (%)
Bogande	1,500	57.0	26.3	40.0	2,280	147	127.2
	2,500	95.5	26.2	40.0	3,820	112	169.2
	1,500	57.0	26.3	40.0	2,280	77	243.1
	600	19.0	31.6	40.0	760	91	105.5
	1,000	38.0	26.3	40.0	1,520	98	191.0
	2,000	55.5	36.0	40.0	2,220	42	94.8
	2,500	191.0	13.1	40.0	7,640	112	661.2
	1,000	76.0	13.2	40.0	3,040	91	806.4
	2,000	76.0	26.3	40.0	3,040	153	122.4
	1,500	76.0	19.7	13.0	988	98	-125.3
Logobou	1,500	101.0	14.8	32.0	3,232	245	169.2
	1,000	101.0	9.9	32.0	3,232	182	440.4
	1,500	101.0	14.8	32.0	3,232	189	219.6
	1,500	101.0	14.8	40.0	4.040	145	395.8
Partiaga	5,000	202.0	24.8	36.0	7,272	77	212.4
	2,500	101.0	24.8	36.0	3,636	77	212.4
	2,500	101.0	24.8	36.0	3,636	77	212.4
	5,000	202.0	24.8	31.0	6,262	105	86.5
	14,000	606.0	23.1	42.0	25,452	112	262.9
	2,000	101.0	19.8	42.0	4,242	126	320.3
	2,000	101.0	19.8	42.0	4,242	105	384.3
	2,000	101.0	19.8	42.0	4,242	182	221.7
	2,000	101.0	19.8	42.0	4,242	91	443.5
	1,500	101.0	14.8	31.0	3,131	77	508.4
Kantchari	1,000	76.0	13.2	34.0	2,584	105	543.1
	750	38.0	19.7	34.0	1,292	112	232.2
Ougarou	1,250	57.0	21.9	40.0	2,280	182	162.9
	1,250	57.0	21.9	40.0	2,280	182	162.9
	3,000	152.8	19.6	26.0	3,973	126	92.7
	2,000	76.0	26.3	26.0	1,976	133	-3.6
	2,000	152.8	13.1	51.0	7,793	175	595.8
	1,000	76.0	13.2	51.0	3,876	168	616.2
	500	38.0	13.2	51.0	1,938	168	616.2
	250	38.0	6.6	51.0	1,938	168	616.2
	250	19.0	13.2	40.0	760	154	476.8
	1,000	76.0	13.2	37.0	2,812	189	345.1
	1,000	76.0	13.2	37.0	2,812	112	582.4

Source: adapted from Tapsoba (1981): 1978-79 farm survey.

interest rates are very high even if, here and there, some become negative. But it is also interesting to note that the level of interest rates borne by borrowers is lower than that accruing to lenders, meaning that we need to look at both sides.

The analysis of one merchant's transaction record book confirms that the two sides may indeed be different. The record shows that in June 1979, the merchant lent a total of 29,000 CFA Francs to 12 farmers at an agreed upon price of 500 CFA Francs for a local tine (approximately 26.3 CFA Francs/kg.) of grain to be delivered at harvest, thus, expecting 58 tines (approximately 1,102 kgs. of millet) to be delivered sometime in November. So, on average, a producer borrowed 2,416.7 Francs to be reimbursed by 4.83 tines (91.77 kgs.) of grain. At harvesttime, however, only six farmers fulfilled their commitment and delivered 39 tines (741 kg.) leaving the merchant short of 19 tines (361 kg.).

One year after he had lent the money and thus seven months after the grain had been delivered, the merchant sold the grain the the neighboring market of Pouytenga at 42,250 CFA Francs (net of transport cost, but including storage cost). Table 7.14 shows the gross interest rates computed from both the lender's and the borrower's sides. The merchant's accrued interest rate is low compared to the estimates in Table 7.13 and may be even lower if storage costs are accounted for. (But had the merchant sold the grain right off to OFNACER at the official price instead of speculating, his gross profit margin would have been higher.) On the producers' side, those who paid back were charged a moderate interest rate compared to estimates of Table 7.13, while those who defaulted that year were subsidized, and overall as one group producers benefited from a negative interest rate. Of course, the magnitude of

Table 7.14

Inputed Interest Rate Charged to Producers Who Paid Back and Received By One Selected Grain Merchant

	Merchant's Side	Producer's Side
Loan (CFA)	29,000	19,500
Quantity of grain repaid (kg.)	741	741
Value of sale/repayment ((CFA)	42,250[a]	20,475[a]
Time lapse (months)	12	5
Inputed annual interest rate	42.7%	12%[c]

Source: personal communication.

[a]Value of grain sales net of transport costs, including loss due to default. An estimate of this loss is: 361 kgs. * (42,250 FCFA/741 kgs.) = 20,583.3 FCFA.

[b]= 39 tines * 525 Francs. The harvest price used is the merchant's quote.

[c]If one were to account also for producers who defaulted on the loan, the resulting interest for all producers would be negative.

the inputed interest is highly dependent on the price and loan period estimates, but the exercise just conducted illustrates the point that a high interest rate accruing to merchants needs not be associated with a high interest rate charged to producers.

The inputed annual interest rate on food grain bought on credit should not be computed on the basis of the exchange ratio alone. Rather, it should also consider the opportunity cost of the grain borrowed in the hungry season, harvest price, and the loan period. The estimated interest is highly dependent on the assumed spread between the hungry season and harvest prices. Ceteris paribus, the larger this price spread, the smaller the interest rate.

7.4.7 Synthesis

In summary, the various sources of information available suggest that millet and sorghum advanced sales do occur, but the proportion of producers involved seems small and each has promised to deliver only a small amount (110 kgs.) of millet-sorghum. Prices paid by merchants for these advance sales are low relative to harvest prices, but it is mainly the very short repayment period that makes the resulting annual interest rates very high in most cases. But from the lender's point of view, if only 50 percent of the farmers ever pay back, then high implicit interest rates do not yield high profits, but help to cover high costs.

The insights gained from these results and some personal communications suggest that the relations between producers and grain merchants are evolving. It would seem that many producers have learned to play tricks with grain merchants by: (1) delaying the repayment; (2) repaying only the capital of the loan in cash; or (3) defaulting on the loan

altogether. The public campaigns may have encouraged these tactics and also the fact that some merchants who provided the funds did not live in the area. Thus, the advance sale arrangement has become a somewhat costly and risky way for merchants to secure grain supplies, and a high cost source of credit for the producers who do actually repay on time.

Money lenders have found ways to enforce cash payment of the loans (see Tapsoba, 1981). In case of credit transactions which involved payment in kind it appears that merchants may be relying more and more on village resident buyers who are given the funds to lend to their fellow farmers and collect the grain at harvest. Being members of the community, these agents are in a better position than merchants to screen borrowers and enforce the contracts.

These contractual arrangements which lead to advance sales, no matter how unpopular they may be, fulfill producers' genuine needs for cash or food during the "hungry season." To do without them, alternative sources of credit in cash and/or food must be found. In Eastern Upper Volta a new such institution to allow producers access to cash and food grain, the "Village Cereal Bank" has been attempted. The following section analyzes the performance of this scheme.

7.5 An Evaluation of the Village Cereal Bank Program

7.5.1 Objectives of the Village Cereal Bank

The Village Cereal Bank program started in 1977 as a pilot project in three selected producers' precooperatives (village groups) financed by USAID. Its justification was the perception that producers were being forced into distress sales at harvest in order to fulfill their cash needs, and into borrowing to buy food in the hungry season when

grain may only be available outside the village. The original idea, as promoted by the MSU's credit expert, looked like a nonrecourse loan program.[14] In subsequent reformulations, however, emphasis on community development was added with the additional expectation of developing a food reserve, and provision of social and other services by the village group to its members. Three broad objectives were stated in the final project document:

(1) To timely provide cash to producers so that they would not be forced into distress sales at harvest for depressed prices.

(2) To make food grain available to rural consumers at the village level at reasonable prices during the rainy season.

(3) To increase revenues of the village group through grain sales in order to allow it to self-finance agricultural inputs, such as improved seeds and fertilizer, and other services or businesses such as a rural pharmacy, a dispensary, and a general store.

The program administered by the E-ORD provides loans at 8 percent annual interest rate to village groups (selected for their progressiveness) to allow them to buy food grain at harvest, store it in the warehouse built by the village group, and sell it back to members and other rural consumers in the rainy season. At that time, the poor transportation network isolates many villages and often make food grain unavailable

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[14] A nonrecourse loan, as operated by the U.S. Commodity Credit Corporation, provides loan to farmers who put their crops as collateral on terms determined by the government price support level (loan rate). Farmers repay the loan (plus storage cost) and take possession of their crops if the market price moves above the support price, or keep the loan if the market price stays below the support price.

to the community. The E-ORD recommends that the purchase price to members and other producers be higher, and the sale price to the same participants be lower, than the respective prices offered by grain merchants. It is assumed that the gross margin would still be adequate to yield a profit after paying for the cost of capital, handling, transportation, and storage. These revenues would finance social and commercial services and their proceeds, in turn, would make the precooperative financially independent in a matter of six years so that the loans could be phased out. The first year, the village group receives a loan of FCFA 600,000, the subsequent years, FCFA 480,000, FCFA 360,000, FCFA 240,000, and in the last and fifth year, FCFA 120,000.

7.5.2 Performance Dimensions

From the Village Cereal Bank objectives and operational set-up, it can be seen that the scheme is a multi-facet project. It operates not only as a consumption credit institution, but also as a grain reserve and food security program set up at the village level, a marketing cooperative, and an agent of change to improve storage conditions and foster community development spirit. An evaluation of such an institution is difficult because of the many alternative performance criteria related to the various goals and because of the lack of recorded information about the operations of the Village Cereal Banks. There are, however, three overriding and interrelated questions of interest to farmers, the E-ORD management, and donor agencies: (1) Do the Village Cereal Banks achieve their stated objectives? (2) Do they fulfill farmers' needs (which we now understand better as a result of the analysis of the grain marketing system in Chapter 5, farmers' food grain marketing behavior in Chapter 6, and farmers' marketing problems? And

(3) What specific problems fact the Village Cereal Banks and how can they be resolved?

Whether the Village Cereal Banks achieve their stated objectives can be examined by looking into the evolution of their membership, the record of procurement and sales of grain, and the financial viability of the system. The other questions can be examined through the diagnosis of the Village Cereal Banks' problems.

7.5.3 Evolution of the Village Cereal Bank Membership

The number of Village Cereal Banks which received some financial support from the E-ORD at one point or another has gone from three in 1977-78, 15 in 1978-79, and on last count (June 1980) five in 1979-80 (see Table 7.15). Two out of the three initial Village Cereal Banks were dropped the next year because of inadequate performance, but also because of inappropriate selection in the first place. Donors' agencies, however, seemed to have been convinced by the usefulness of the program, for in that next year three more donors joined USAID and the number of Village Cereal Banks was expanded to 15. In 1979-80, however, only one new Village Cereal Bank was financed and all previous Village Cereal Banks were dropped except one. Thus, the extent to which donor agencies have supported the Village Cereal Bank proved to be critical.

Likewise, the E-ORD team had a successful campaign promoting the concept of the Village Cereal Bank to producers. In 1978-79, 30 village groups started their own Village Cereal Bank financed by their own reserves accumulated over the years (FCFA 50,000 or less). Even though many of these villages might have started the Village Cereal Bank in order to attract future loans from the E-ORD, their decision demonstrates

Table 7.15

Number of Active VCBs
(1977-78 to 1979-80)

Year	Village Cereal Banks (Village Groups)
1977-78	Tapoa, Logobou, Piela
1978-79	Tapoa, Bourgou, Kikideni, Ougarou, Samou, Boudieri, Boulel, Diagorgou, Gayeri, Koulwokou, Sakpani, Tampoudin, Tindangou, Toussiegou, Yenkoali
1979-80	Bourgou,[a] Kikideni,[a] Ougarou,[a] Samou Zembede

Source: 1980 Village Cereal Banks Survey.

[a]Operated that year without the E-ORD loan.

that producers in E-ORD were receptive to a certain idea of the Village Cereal Bank.

Yet, it does not appear that the village groups who received the financial help to set up Village Cereal Banks attracted new members because of it. Table 7.16 shows that, in most instances, the membership after the creation of the Village Cereal Bank is not larger than what it was before. We must keep in mind, however, that comparison of "before" and "after" is a crude proxy to capture the impact of a project. In the few cases (four) where membership has increased, some other aspects than the Village Cereal Bank may have been added to the village group. (For example, at Tapoa, a lowland rice project attracted new members in the village group.) The figures also show that the amount of the loan extended was not in line with the village group membership when

Table 7.16

Evolution of the Membership of the VCB From 1977 to 1980

ORD Secteur	Village Group	Village Group (VG) Established	Membership at VG Creation	Village Cereal Bank (VCB) Established	Membership of VG as of June 1980	Total Amount Granted at VCB Creation (CFA)	Loan Per Member at VCB Creation (FCFA)
Bogande	Bourgou	1978	100	1978	64	157,850	1,578.5
	Samou	1977	12	1978	10	150,000	12,500.0
	Piela	1977	10	1977	10	600,000	60,000.0
Diabo	Koulwoko	1977	12	1978	32	600,000	50,000.0
	Tampoudin	1977	10	1978	10	300,000	30,000.0
Diapaga	Logobou	1975	10	1977	10	600,000	60,000.0
	Tapoa	1973	32	1978	82[a]	600,000	18,750.0
Fada	Kikideni	1974	21	1978	14	200,000	9,523.8
Kantchari	Boulel	1977	9	1978	9	180,000	20,000.0
	Boudieri	1973	28	1978	9	80,000	8,888.9
	Diagorgou	1977	10	1978	10	200,000	20,000.0
	Sakpani	1973	8	1978	15	200,000	25,000.0
	Toussiegou	1977	12	1978	12	154,150	12,845.8
Matiacoali	Gayeri	1977	12	1978	6	600,000	50,000.0
	Ougarou	1977	8	1978	8	500,000	62,500.0
	Yenkoali	1977	5	1978	4	500,000	100,000.0
Pama	Tindangou	1976	7	1978	5	200,000	28,571.4
	Zembede	1979	15	1979	17	300,000	20,000.0
Total	-	-	321	-	327	6,122,000	-
Mean	-	-	17.8	-	18.17	340,111.1	19,071.6

Sources: 1980 Village Cereal Bank Survey, E-ORD reports.

[a]New members came in 1980 because of the bas-fond project. Before that, there were only 18 members.

the Village Cereal Bank was set up, for some cases loan per member was as high as the total annual farm income and in other cases it was only a few thousand FCFA.

7.5.4 Procurement and Sale of Grain

Table 7.17 shows that the Village Cereal Bank did buy at higher prices and sold at lower prices than grain merchants. This, however, says nothing about whether prices offered had a relationship to costs of operation and long-term financial viability of the Village Cereal Banks. In most instances, the prices offered were strictly imposed by the donor agencies or by the E-ORD. In other instances, when purchases were made very late in the season, the Village Cereal Bank had to buy at the prevailing market prices. Table 7.18 indicates that indeed many purchases were made late in the season because of the poor scheduling of the loan installments.

The scheduling of the loan installment has handicapped many Village Cereal Banks, but all managed somehow to buy food grain. The next question then becomes how much grain was sold in the hungry season. Table 7.17 shows that only one Village Cereal Bank (Tindangou) had not sold its stock in the preharvest season. But for the others, some of the sales were made at credit and had not been paid for as of June 1980. This situation has forced some four Village Cereal Banks to default on their loans and the others to delay repayment. It was learned that in some cases, for example in Gayeri and Yenkoali, most of the credit was made to the E-ORD extension agents. (No Village Cereal Bank would turn down such a request by agents who represent the authority in the mind of producers.)

Table 7.17

Millet-Sorghum Bought and Sold by VCBs in 1978-79

Sector	VCB	Loan Received FCFA	Number of 100 kg. bags Bought	Average Purchase Price (FCFA per 100 kg. bags)	Sale Price at Harvest (FCFA per 100 kg. bags)	Number of 100 kg. bags Sold Cash	Average Sale Price (FCFA Per 100 kg. bags)	Trader's Sale Price (FCFA Per 100 kg. bag)	Number of 100 kg. bags Not Sold at Credit
Bogande	Bourgou[a]	157,850	33 1/3	4,735.5	3,000	33 1/3	6,300	7,200	-
	Samou	150,000	20	4,650.0	3,000	20	6,000	6,000	-
Diabo	Koulwoko	600,000	78[b]	6,235.9	4,830	47	7,250	7,500	31[d]
	Tampoudin	300,000	14[b]	6,000.0	4,000	14	7,000	7,350	-
Diapaga	Tapoa	480,000	44[b]	3,736.4	3,000	44	5,000	7,000	-
Kantchari	Boulel	180,000	36	5,000.0	4,500	31	6,000	7,000	5[c]
	Diagorzou	200,000	51	-	-	-	-	-	-
	Boudieri	80,000	14	4,400.0	3,750	12	4,750	6,000	2[c]
	Sakpani	200,000	45	4,366.6	4,000	20	5,750	6,000	25[c]
	Toussiegou	154,140	32	4,157.8	3,000	21	5,500	5,500	11[c]
Mahacoali	Gayeri	600,000	97	4,500.0	3,000	64	7,500	7,500	22[c,e]
	Dugarou	500,000	108	4,000.0	4,000	108	5,800	6,200	-
	Yenkoali	500,000	74 1/3	4,500.0	4,000	60	6,000	6,000	14 1/3[c]
Fada	Kikideni	200,000	32	5,000.0	4,000	14	7,500	8,000	17[c]
Pama	Tindangou	200,000	55	3,600.0	3,000	6	4,500	5,000	54

Source: 1980 Village Cereal Bank Survey.

*Note: when price was given per tine or per Assiette Yorba (AY), we assumed 6 times = 42 AY = 100 kg. Price quotes by VCB members.

[a]Price at the village level as contrasted to purchase price which is from whichever area grain was bought.

[b]Other crops besides millet/sorghum bought but not accounted for here.

[c]All sacks sold at credit.

[d]Part sold at credit.

[e]One sack given to truck driver who transported the grain.

Table 7.18

Number and Scheduling of Loans
to Village Cereal Banks

Year	Number of Loan Installments	VCB	Dates of Loan Installments		
1977	1	Piela	11/5/77		
	2	Tapoa	11/28/77	NA	
	2	Logobou	12/8/77	NA	
1978	1	Bourgou	2/26/79		
	1	Samou	2/28/79		
	2	Koulwoko	2/2/79	3/2/79	
	2	Tampoudin	12/2/78	2/9/79	
	2	Tapoa	1/2/79	2/3/79	
	2	Boulel	1/2/79	2/3/79	
	3	Diagorgou	12/19/79	1/31/79	3/26/79
	1	Boudieri	12/16/78		
	3	Sakpani	12/15/78	1/12/79	2/22/79
	3	Toussiegou	12/16/78	2/3/79	3/2/79
	3	Gayeri	12/18/78	1/19/79	2/8/79
	2	Ougarou	12/18/78	1/19/79	
	2	Yenkoali	1/12/79	2/2/79	
	1	Kikideni	3/9/79		
	2	Tindangou	1/24/79	March 79	

Source: 1980 Village Cereal Bank Survey.

NA: Not available.

Another dimension of the procurement and sale of grain is the extent to which members of the Village Cereal Bank sell to and buy from their cooperative. Interviews of the members reveal that these sales and purchases were not very important. The small volume of sales back to Village Cereal Bank members, obviously, is due to the small membership of the Village Cereal Bank relative to the volume of grain the loan can buy. As for the sales, some members were not aware that they could sell their grain to themselves and buy it back later.

7.5.5 Viability of the Village Cereal Bank System

To be viable, the Village Cereal Bank should be able to cover costs, make a normal profit, and pay back the loan on time. The evaluation of the profitability of the scheme requires a financial analysis of the project. Unfortunately, neither the ORD nor the Village Cereal Bank members kept any records of the transactions. The E-ORD criterion of evaluation was not the Village Cereal Bank's profitability, but rather its ability to repay the loan.

Table 7.19 shows the loan repayment rate for the Village Cereal Bank operating in 1977-78 and 1978-79. Ignoring the fact that Logobou paid back more than two-thirds of its loan after the due date, the repayment rate in 1977-78 was very impressive (93.3 percent). The following year, however, the loan repayment rate had dropped to 47.7 percent. In fact, only three Village Cereal Banks had repaid back the entire loan plus interest, while four Village Cereal Banks had not repaid anything, up to 1980. Thus, on the basis of the repayment rate, the Village Cereal Bank had not performed very well and this has contributed to the weak support of the Village Cereal Banks by donors in 1979-80.

Table 7.19

Loan Repayment Rate of VCBs

Year	VCB	Loan (FCFA)	Interest[b] (FCFA)	Total Repaid (FCFA)	Amount Not Yet Repaid by June 1980 (FCFA)	Annual Repayment Rate (Percent)
1977-78	Piela	600,000	33,539	633,539	-	
	Tapoa	600,000	32,153	632,153	-	
	Logobou	600,000	40,194	512,329[a]	127,865	
	Total	1,800,000	105,886	1,778,021	127,865	93.3[d]
1978-79	Bourgou	157,850	6,435	164,285	-	
	Samou	150,000	8,055	78,904	79,151	
	Koulwoko	600,000	37,392	150,000	487,392	
	Tampoudin	300,000	8,091	308,091	-	
	Tapoa	480,000	15,474	495,474	-	
	Boulel	180,000	10,288	162,000	28,288	
	Diargorgou	200,000	12,879	52,460	160,419	
	Boudieri	80,000	5,593	-	85,493	
	Sakpani[c]	200,000	9,420	207,800	1,620	
	Toussiegou	154,140	9,326	100,000	63,466	
	Gayeri	600,000	38,970	480,000	158,970	
	Ougarou	500,000	32,636	-	532,636	
	Yenkoali	500,000	32,932	58,000	474,932	
	Kikideni	200,000	10,345	-	210,345	
	Tindangou	200,000	12,274	-	212,274	
	Total	4,501,990	250,110	2,257,014	2,495,086	47.4[e]

[a] 353,587 was repaid after the 1978 due date, in 1979.

[b] The due date is March 31, every year.

[c] Sakpani acknowledge having paid only 100,000, which is consistent with the income from the total number of bags (20) they sold for cash.

[d] Computed as: 100 * 1,778,021/1,905,886.

[e] Computed as: 100 * 2,257,014/4,752,100.

7.5.6 Problem Diagnosis

The poor performance of the Village Cereal Bank stems from the organizers' misunderstandings of farmers' real needs. In essence, there are conflicting objectives set for the Village Cereal Banks. This poor performance is related also to the fund's availability and timing of delivery, the managerial capability of the Village Cereal Bank, and the role of the Village Cereal Bank in relation with other institutions in the Eastern Region.

Misunderstanding and Conflicting Objectives

The results presented in previous chapters suggest that an important number of producers are not producing enough grain to be self-sufficient. However, there was no strong indication of either harvest distress sales or important advanced sales as far as the number of participants and volume dealt with are concerned. Rather, given the export orientation and other characteristics of the grain marketing system, there is a problem of the reverse flow of grain to producer-consumers through market intermediaries.

But one conflict arises because the availability of grain in the village during the hungry season is valued differently by Village Cereal Bank members of different age groups. Elder members who are heads of households and obligated to provide food to the households value the availability of food grain more than the younger members who don't have this responsibility. For these young members, the profit motive is stronger than food security and, given the large size of the Village Cereal Bank loans relative to village membership, many have attempted to invest in other and more profitable commodities such as rice, peanuts, and shea nuts (see Table 7.16).

Many members were not also clear on how the financial reserves would be built in view of the fact that some activities of the business (pharmacy and general store) may be risky. Indeed, there may be another conflict between the build-up of an independent financial basis and the provision of services that do yield little, if any, monetary benefits (dispensary). Some members thought that the credit would be available on demand and not compulsory as the phase out suggested. In another area still, the goal of price stabilization may conflict with the profit motive.

Funds' Availability and Timing of Delivery

The availability of funds is a major problem in view of the limited resources of the E-ORD. At the same time, one cannot justify providing funds to Village Cereal Banks regardless of its membership unless it is expected that by so doing the precooperative will attract more members. As we have seen, no such effect took place. The numerous (30) village groups that have established their own Village Cereal Bank may be an indication that producers are willing to pay for the scheme. What may be needed is a meaningful contribution of each village group.

The untimely delivery of the loan installments has had an adverse effect on the performance, as it did on previous E-ORD marketing campaigns. For example, the last Village Cereal Bank created (Zembede) got its second installment in May when no grain was available at a price that could have provided an opportunity for resale and payment of all costs. Although there is no strong indication of harvest distress sales, late Village Cereal Bank purchases caused by late loan delivery reduce the likelihood that members of the village group would be able to supply the Village Cereal Bank. This prevents the local village economy from

capturing all the benefits of the scheme which entails purchasing grain from members at higher prices than traders.

Managerial Capabilities of the Village Cereal Banks

At the outset, the sheer volume of the loan confused the members of the village group, many of whom had never seen so much cash at once. The money was allocated to two to four members to purchase the grain. When the loan came late, they had to move farther away from their village to find available supplies, and some (from Tampoudin) even went to Ouagadougou. And it also happened that appointed buyers embezzled the funds.

The Village Cereal Bank bought the grain at many sources and usually not from their village, let alone from their members. (Exceptions are the Village Cereal Bank of Ougarou which had only to go to the next big market, Nassougou; and the Village Cereal Bank of Gayeri which had to go to the next village, Bassieri.) Therefore, they had great logistical difficulties in trying to bring the grain to one place. Only a few Village Cereal Banks (Bourgou, Samou, Ougarou, and Gayeri) were able to keep the grain under one roof, while the others were forced to use two to four different locations to store the grain. Later on, the business of selling the grain was complicated because, again, too many sellers and too many selling points were involved, making the control difficult, if not impossible.

The grain is usually stored in bags in one member's house. Some Village Cereal Banks, however, have built their own storage facilities as promoted by the program. Others have used available public facilities such as the ORD warehouses, school warehouse, and in one occasion

(Bourgou) a concrete silo built during colonial times. Except for the concrete silo, farmers felt that the storage facility used would be adequate only if the grain is stored for a short period and sold right on time in July-August. They estimated that they would lose the grain if it stayed two to three seasons in the members' houses. (In effect, nearly all the stock of the Village Cereal Bank of Tindangou, which was not sold after two years, was rotten.) If the grain is stored just for a few months, the storage loss is low coming only from humidity and the domestic animals, rather than from termites. (Usually, only three doses of insecticide--HCH--are used.)

The Village Cereal Banks who had their own storage facilities had built them just like dwelling units with tin tiles. The E-ORD management sometimes helps in the transportation of the tiles and sometimes donates the cement, but there is not much emphasis on how to help improve the storage conditions on farm. No one farmer would think of building the same facility to store the household grain for an extended period of time.

Finally, the grain is often sold at credit and there does not seem to be much pressure on the members to pay back. They tend to think that the grain is not so much theirs as it is the E-ORD's. In many instances, they also feel somewhat safe in not paying back since the extension agent has also taken the grain at credit and not repaid

Market Policy Coordination

A grain reserve scheme operated for the needs of rural producers and consumers is very risky because of the precarious logistical conditions, the lack of transportation, and the lack of effective storage facilities once the grain has to be held the entire rainy season.

There are financial risks as well due to the variability of prices. In the mind of many members of the Village Cereal Bank, since the ORD is the promoter of the idea, it should also help coordinate the difficult instances when the hungry season is passing by without the grain being sold. But the role of the Village Cereal Bank in relation to OFNACER and the private sector was not thought through.

Forced by the flaws of the loan installments or the lack of local supply, the Village Cereal Bank buys outside the village. Likewise, it sells to other villages because the grain bought often exceeds its members' demand. But when there is not much demand from its members and other consumers in neighboring villages (because of good harvests and consequent stock build-up), the access to far away markets becomes important. Logobou, in 1977 and Tindangou, in 1978-79 faced these prospects. Members of the Village Cereal Bank of Tindangou had requested in vain a truck from the ORD to move the grain to Fada or other deficit areas. The grain that stayed too wet seasons in inappropriate storage facilities was lost.

7.5.7 Synthesis

The Village Cereal Bank program is a multifacet project of which the marketing cooperative and consumption credit dimensions have been adopted by producers in the E-ORD. The poor performance of the Village Cereal Bank financed by the E-ORD can be traced to the poor definition and implementation of the concept. Producers have not clearly understood what their roles and responsibilities should be, and lack the managerial ability to run a reserve system when the lax control by the E-ORD management compounds the logical problems and encourages embezzlements.

All these factors show the important need for further research and understanding of what roles private and well-run public firms should play in order to promote a financially viable operation in the face of the tremendous uncertainty and logistical problems. OFNACER can play an important role in identifying useful marketing services and new marketing practices which need to be supported by market participants. In turn, the Village Cereal Bank must reduce its ambitious objectives, tighten its control, and provide members with the managerial tools to conduct the operations themselves.

7.7 Summary

Grain producers in E-ORD are aware of a large spectrum of marketing problems. It appears, however, that they are not given enough opportunity to discuss them with the E-ORD extension agents. Overall, their attitude towards the E-ORD marketing campaigns is negative because of organizational failure. In addition, a great number of producers are not even aware of OFNACER's existence or think that the agency is not interested in their crops. Given the poor infrastructural support (roads and markets), it is not surprising that market access ranks high in producers' concerns.

In spite of the fact that some producers do not know of OFNACER, the agency's market share in the areas and periods it intervenes looks somewhat higher, at 20 percent, than the ball park figure of 10-15 percent. Unfortunately, a comparison between OFNACER's market share and that of grain merchants is not possible because the questionnaire design did not account for the merchant's agent network.

One major concern of public authorities concerns the shortcomings caused by nonstandardized measures. Grain producers are also aware of

these shortcomings. Though the empirical evidence shows mixed results as to the producers' perception of market unfairness related to grain measurement, it indicates that producers show preferences for widely used and convenient measures they can trust. Indeed, there is a distinct differential between a small measuring device (louche) used by assemblers and producers-retailers. However, part of this differential represents producers' time opportunity cost and wholesale-retail price margin. At any rate, assemblers themselves would rather use larger measures. Thus, there seems to be a genuine opportunity to promote more effectively standardized measures that meet the needs of market participants.

Another major concern of public authorities is the alleged practice of "green sales," actually advanced sale arrangements. Advanced sale prices quoted for harvest deliveries may be low when compared to actual harvest prices, but the high imputed nominal interest rate of credit derived is mostly due to the very short repayment period. However, these figures should be put in perspective because of the fact that the magnitude of advanced sales among producers is rather limited in terms of number of participants and volume of grain. The possible high default rate does not encourage merchants to practice the arrangement on a large scale.

The credit arrangement between producers and traders or among producers themselves (mostly without interest) takes place because they fulfill a genuine need for farmers often faced with low food availability in the "hungry season." For this reason, the concept of the Village Cereal Bank has caught on with many producers in the region. The

Village Cereal Bank project, however, is itself ill-conceived and ill-managed, and runs the risk of deepening the mistrust of producers toward the E-ORD.

All of these results show that a well-run public agency can play an important role by identifying useful marketing services and new marketing practices which need to be supported by the main groups of market participants. There is a real need for more research to help discover ways to help village groups, private traders, and OFNACER improve food availability and security in the E-ORD.

CHAPTER 8

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

8.1 Study Objectives

The overall objective of the study was to improve the understanding of the processes of the rural food grain marketing system and of producers' grain marketing behavior in Eastern Upper Volta. The specific research objectives were the following: (1) to review the major food grain marketing issues in Upper Volta from the country's independence (1960) to the late 1970s; (2) to describe and analyze the rural food grain market channels and processes in terms of the organization and standard operating procedures of the major market participants; (3) to analyze producers' grain marketing behavior at the village level; (4) to provide a diagnostic analysis of farmers' market linkages and problems; and (5) to suggest policy recommendations to improve the performance of the system and to identify future research needs.

The study was part of an applied microeconomic research effort conducted by MSU in the context of an E-ORD Integrated Rural Development Project financed by USAID. A farm survey of 480 farmers conducted from May 1978 to April 1979, and a market survey conducted from July 1979 to June 1980 provided the main sources of information (see Chapter 4).

8.2 Major Research Findings

The major research findings can be grouped into six broad areas of interest: (1) historical perspective of food grain marketing issues in

Upper Volta (see Chapter 3); (2) characteristics of the E-ORD's food grain marketing channels (see Chapter 5); (3) farm-households' food grain flows and transaction patterns (see Chapter 5); (4) timing and farm gate prices of farm grain sales and purchases (see Chapter 6); (5) farm-households' cash flows (see Chapter 6); and (6) selected food grain marketing problems and issues in the E-ORD (see Chapter 7).

8.2.1 Historical Perspective of Food Grain Marketing Issues in Upper Volta

Active participation by Voltaic governments in agricultural marketing concerns can be traced to the early years of the country's independence with the establishment in 1964 of a stabilization fund for export crops. But direct public interventions in the buying and selling of grains can only be traced to the early 1970s with the establishment in 1971 of the National Cereal Board, OFNACER.

In the mid 1950s, private traders gained an access to the assembly of export crops and the capital thus accumulated, through the early 1960s, enabled many to expand dramatically their scale of operations in grain marketing. Monopoly rights were granted in 1968 to the Regional Development Organizations (ORDs) for the assembly of export crops, and in 1974 to the ORDs and OFNACER for the assembly and distribution of food grain. These government attempts to monopolize agricultural marketing failed because of poor logistic planning, the lack of coordination among numerous public agencies, and strong competition from the private sector. Through each of these attempts, the importance of private merchants grew stronger so that in the late 1970s government policy has become more liberal toward the private sector. There is, however, strong evidence to suggest that government active participation and sometimes

direct intervention in grain marketing will continue. Better information about the actual workings of grain markets needs to be provided to make this intervention more effective and efficient than in the past.

8.2.2 Characteristics of the E-ORD's Food Grain Marketing Channels

The major participants in grain marketing in Eastern Upper Volta performs several functions. Farmers are grain producers, but they are also known to retail their crops, to play the role of middlemen, and to buy back food grain for consumption. Private traders may engage both in wholesaling and retailing and are thus best categorized on the basis of the title to the grain (merchant and agent middlemen), the renumeration of the agent middleman (trader's apprentice, commission agent, village resident buyer, and landlord), and the trading range (national wholesaler-retailer, regional wholesaler-retailer, and local independent trader). The government cereal marketing board (OFNACER) is active in grain marketing, but the E-ORD management is not. Truck transporters also play an important role in grain marketing.

The grain exchange system in the E-ORD is a mixture of house trading among village households, farm gate oriented grain assembly, and marketplace oriented trading. The farm gate-oriented grain assembly is particularly adapted to the E-ORD local conditions. The region has a sparsely and unevenly distributed population, a very poor road accessibility, and a rainfall-induced instability of grain production which all translate into small rural markets (178 markets for 635 villages) most of which are periodic, or even more temporary, and (65 percent) serve but one village. Under these conditions, quite a few transactions must take place outside the marketplaces whereby grain merchants set up a

network of agents to collect grain (and other agricultural products) at the farm gate.

The description of the food grain marketing system reveals that market coordination in the private channels is hampered by the lack of working capital and the mistrust among participants which translate into costly control procedures of the agent network. OFNACER intervention in the system at the farm gate is intended to directly benefit grain producers. At the marketplaces OFNACER purchases from small local independent traders put some competitive pressures on national wholesaler-retailers and creates indirectly some effective demand for farmers' produce. OFNACER purchases from merchants cost very little in terms of logistical set up, while allowing private traders to reach producers in more isolated areas.

Both private and public marketing networks are geared at exporting grain outside the E-ORD and are less effectively structured at serving rural consumers in the hungry season and/or in isolated areas. For example, food grain is available in only 33 percent of the rural markets in the hungry (rainy) season, and there are few agent networks set up by grain merchants to distribute grain to rural consumers at the farm gate. Thus, rural consumers in the hungry season and/or in isolated areas must rely on their own stocks or the house trade which distributes local grain surplus among village households.

For illustrative purposes, the study constructed physical distribution costs (buying, handling, transportation, and storage) incurred by private traders. Transportation costs account for up to 80 percent of total marketing costs, when merchants' own time costs are left out. In most cases, the costs of storage are small because traders emphasize a

rapid turnover of the stocks to cope with the lack of working capital, and/or limited stocks to cope with the low concentrated effective demand of the sparse and poor rural populations.

8.2.3 Farm-households' Food Grain Flows and Transaction Patterns

The grain flow statement was used as a practical tool to gain a better understanding of producers' behavior with respect to grain marketing (see Chapter 6). The grain flow statement compares all sources of grain (production, purchases, gifts, credit, and wages) to all uses of grain (sales, gifts, credit, labor payments, farm uses, and consumption) and derives a change in stock as a residual under the assumption of a minimum annual consumption requirement of 175 kg. per capita. Performance measures, and marketed and marketable surplus are estimated for households located in five ANTRAC zones of the 1978-79 farm survey. Despite some data limitations, this analysis helps bridge some gaps in the understanding of producers' marketing behavior in the E-ORD.

Overall, a few hundred kilograms are dealt with and these relatively low levels of production and exchange flows convey very well the modest level of agricultural development of the average farmer in Eastern Upper Volta. Although ANTRAC households seem to deal with more volume than hoe (traditional) counterparts, we must keep in mind that such a difference is largely due to the larger family sizes of ANTRAC households. For the most part, the grain flow analysis shows a zonal heterogeneity in which the large producing zone of Ougarou contrasts with the drought-stricken and low-producing zone of Piela.

In three out of the five zones selected for the study, grain stock by the end of the year has been decreased relative to the previous year's level. Because the change in stock is derived under the assumption of a

minimum consumption requirement, when the size of the stock depletion is large relative to the year's production, we infer that the household may have actually consumed less than the annual minimum requirement of 175 kg. per capita. This possibility is strongest for the average household in Piela Zone. In all the zones studied, the results of a sensitivity analysis tentatively set the estimated average annual grain consumption between 165 kg. and 190 kg. per capita.

An important result of the study is that in all 11 villages except one, the average producer bought more grain than was sold in 1978-79. That is, in only one village does the average producer show a marketed surplus. As for marketable surplus (which include a stock build-up potentially available for sale) in only two villages does the average household show a surplus. Unfavorable weather conditions may explain the low production. But these heavy purchases should dispel the myth that grain marketing in E-ORD can only be viewed as extracting grain from producers of the region.

Another important result from the grain flow analysis is that the amount of grain given out through barter may be more important than farm sales. Thus, a narrow definition of marketable surplus is likely to provide meaningless results. The analysis also shows that overall, the amount of grain given out to pay for past debts (which include loans taken from traders) is less than that given out as gifts.

When the data on farm sales (out of farmers' production) and household purchases (for farm use and home consumption) are disaggregated on a household basis, the results show four patterns of grain transactions: In the five ANTRAC zones studied, 14.3 percent of farmers have had no grain transactions at all, 50.5 percent have bought, but did not sell,

9.7 percent have sold, but did not buy, and 25.5 percent have bought and sold grain in 1978-79. In the last category, almost 80 percent of the households had repurchased grain in excess of their farm sales. Thus, not only have producers bought more grain than they sold as shown by the grain flow situation, but also more producers have bought or have had larger purchases than producers who have sold grain.

The analysis also indicates that households who did not sell any grain were the ones with the poorer grain harvests in 1978-79. These results help explain why grain transaction patterns vary significantly across ecological zones. The results suggest that farm grain sales increase with the household income bracket and show inconclusive evidence on the impact of market location on the pattern of transaction, but these results were presented with caution because of some data limitations.

When compared and contrasted, the major significant difference in the behavior of ANTRAC and traditional households is in the pattern of purchases: Traditional households had heavy grain purchases (61 to 68 percent) in the hungry season, as would be expected, while ANTRAC households had only 41 to 54 percent of their purchases in the same period. But for both households, the evidence does not suggest any grain distress sales at harvest: Only 22 and 35 percent of the total grain was sold during the harvest period, while 63 percent and 57 percent of the grain was sold in the postharvest period.

8.2.4 Timing and Farm Gate Prices of Farm Grain Sales and Purchases

The evidence on the timing of sales and purchases also indicates that the groups of households with only farm grain sales and those with

only grain purchases tend to have a regular pattern of transactions throughout the year. For the group of households with both sales and purchases, the timing of transactions shows heavy purchases in the hungry season, but farm sales are still mainly concentrated in the postharvest. The timing of sales and purchases further indicates that in all three income classes, grain purchases are made in a somewhat regular pattern throughout the year. There is a slight indication that middle income farmers have heavy sales (42 percent) in the harvest period, but even then an equal amount is sold at a regular pace in the postharvest period, thus showing no strong indication of harvest distress sales.

As expected, farm gate prices are lowest at harvesttime and highest at the hungry season. For the period studied, the average farm gate price is lower than the official producer price. Overall, farm gate prices paid are higher than farm gate prices received, but the two are not significantly different in the hungry season. In other periods, the two series tend to move together, which is consistent with the fact that for numerous households the timing of sales and purchases are somewhat similar throughout the year.

Because the timing of sales analysis shows that the average household does not sell disproportionately more grain at harvest than in other periods (that is, there are no indications of harvest distress sales) the negative effect of low producer prices at harvesttime on the average farm income is likely to be dampened.

8.2.5 Farm-households' Cash Flows

The evidence from the cash flow analysis indicates that sales of crops (food and cash crops combined) are a relatively minor part of the sources of the farm family cash revenues. At most, crop sales make up

40 percent of cash revenues in November-December (harvest) for households who have no transactions in grain. (Grain still remains the most important farm crop sold by the average farmer in E-ORD.) In 1978-79, as indicated by the negative cropping cash surplus, the average household in the zones studied was not able to cover its food purchases out of its net cropping revenues. Hence, the introduction of animal traction which had not had any dramatic impact on yield put added cash constraints on farmers.[1]

The small contribution of crop sales to cash revenues convey farmers' low monetization level with respect to crops, but not necessarily with respect to other activities. In most instances, the most important source of cash is livestock. But other activities such as trade in agricultural products, agricultural processing and nonfarm and related labor sales type activities also contributed significantly to cash income.

The cash flow analysis also shows that cash outlays for foodstuffs are relatively more important for traditional households than for ANTRAC households. In absolute terms, however, ANTRAC households still spend more cash on food than traditional households because ANTRAC households have larger family sizes. But for these ANTRAC households even more cash is spent on cropping enterprises, livestock raising, and ANTRAC equipment. Thus, ANTRAC households are forced into more cash outlays because of ANTRAC adoption while the cash generating power of the cropping enterprises remains very small.

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[1] See Lassiter (1982).

8.2.6 Diagnosis of Food Grain Marketing Problems and Issues in the E-ORD

The diagnostic analysis of farmers' market linkages and problems examines farmers' opinions on marketing problems, the issues of grain measurement, the issues of marketing credit and advanced sales, and the performance of the Village Cereal Bank program (see Chapter 7).

The analysis finds that producers are not given enough opportunity to discuss marketing problems with extension agents. This, and the ORD's past failures and unkept promises can be suggested as the reason why very few producers (26 percent) would still want to sell to the E-ORD. Some 12 to 16 percent of producers who have not sold to the OFNACER have never heard of the agency before, some 25 to 34 percent think that they have too small a volume to sell, and some 60 to 45 percent wanted to sell, but could not gain access to the agency. The survey reveals than an access to a secure market [through road improvement or the presence of public (or private) buying agents] is an important dimension of the marketing problems perceived by producers.

The ORDs and OFNACER have long sought to promote standard units of measurement in order to make the handling of products during transactions more efficient, to help prevent possible wrongdoing by those who measure grain during transactions, and to make the dissemination of market information easier.

The analysis reveals that 80 percent of heads of households interviewed on the farm usually measured grain before taking it to the market. In addition, regardless of whether they have measured grain on the farm, these heads of households think that they usually receive at the market the grain value expected. But another group of farmers (made up of heads and other members of households) interviewed at the marketplaces indicates

that less than half of them had actually measured grain on farm prior to the market visit. In addition, those farmers who have measured grain on the farm tend to have higher expectations about the value of market sales than those who have not. The study hypothesizes that this difference is due to the fact that heads of households have more responsibility, more volume of grain to sell, and possibly better market information than the average farmer interviewed at the markets.

Producers at marketplaces have the opportunity to retail their products themselves if they do not like traders' measuring device and/or price offers. An experiment conducted at Namounou shows that the non-standard devices (louches) used by merchants and producers differ significantly. It was not possible, however, to determine whether the wholesaler-retailer price spread in the same market on the same day for similar products justified traders' marketing costs and normal profit return.

It appears clearly that producers are aware of the benefits of standardized measures and traders will welcome larger units than the small calebash (louche) used in Namounou. However, the promotion of the official 20-liter tine and the scale is not taking hold. Producers' preferences are for a trustworthy standardized measure which would be convenient to use and would have large acceptance in the area.

Credit transactions cover many dimensions in the rural economy of the Eastern Region, but the ones between producers and merchants are of particular interest because of the public perception of producers being exploited. The analysis helps put a better perspective on the alledged traders' exploitative behavior through an analysis of the importance of advanced sales, which are often inappropriately termed "green sales."

The results show some arrangements are used whereby traders lend money or sell grain on credit to producers for payment in kind at harvest. The imputed interest rates on these arrangements may be quite high mostly because of the very short repayment period. But the magnitude of the advanced sales itself is very small in terms of the number of producers involved (from 8 to 14 percent) and the volume involved (from 70 to 100 kg.). There is also evidence to suggest that such arrangements are very risky because in one instance up to 50 percent of the producers defaulted on or postponed the payment in kind. Obviously these risks reduce the likelihood that the practice will spread beyond its present limited use.

Advanced sales arrangements (between producers and traders) and other informal credit arrangements are used by some producers to gain access to food, especially in the "hungry season." Thus, the idea of a Village Cereal Bank scheme which would provide credit to farmers to buy grain and reduce food shortages in the hungry season is accepted by many village groups. But the performance of the Village Cereal Bank scheme as supported by the E-ORD through a loan program financed by USAID and other donors is very disappointing. There is no indication of increased membership of the precooperatives because of the scheme, the repayment rate is very low, and members are confused and disenchanted with the project. This performance was caused by the rather poor definition and implementation of the concept: The many and sometimes conflicting objectives of the Village Cereal Bank are confusing, loans are not delivered timely, and cooperative members have no managerial talent to keep operational costs low. The whole scheme runs the risk of being rejected by producers even before it has the chance to be adequately tested.

8.3 Recommendations

Policy actions are recommended in broad areas, on the basis of an improved understanding of the E-ORD marketing system and under the assumption of continued public involvement in grain marketing.

8.3.1 Improved Sorghum-Millet Varieties and Farming Techniques

An effective marketing system articulates consumers' effective demand and provides economic incentives to producers to increase food production. However, the low level of commercialization in the E-ORD is clearly related to the relatively low level of production. The extent to which food production can be increased is limited among other things by the biological potential of food crop varieties. To provide abundant food supplies in E-ORD, the food grain biological potential and farming techniques must be improved along with the improvement of the marketing system.

8.3.2 Physical Infrastructure

Given the poor rural infrastructure of the E-ORD, there is no doubt that a better road system will increase the performance of the grain marketing system in the E-ORD by providing access to markets and by reducing transport costs. In that respect, the USAID financed road project in the Namounou area will increase farmers' access to the large rural markets of Namounou and Diapaga. But much more still needs to be done (for example in the Pama area) to increase road accessibility in the E-ORD.

8.3.3 The Marketing Role of the E-ORD Management

Past experiences indicated that the E-ORD management lacked the financial, managerial, and logistical capabilities to set up a sound food grain buying and selling network region-wide. In the foreseeable

future these capabilities are likely to remain a constraint. To obtain maximum effectiveness of the limited human resources, we recommend that the marketing role of the E-ORD be focused more on the following areas.

First, do more to provide marketing advice to producers. At present, there is almost no marketing information exchange between producers and extension agents. Extension agents can help producers better plan their sales and purchases by providing market intelligence on prices and supply conditions in important centers of the E-ORD and neighboring regions.

Second, facilitate grain transactions between OFNACER and farmers precooperatives if OFNACER continue to buy grain. What will be often needed will be for the extension agent to inform farmers of OFNACER buying campaigns, and help OFNACER agents get access to potential sellers. Such an arrangement (which takes place in Madjoari for example) helps OFNACER agents, often ignorant of the local conditions, reduce logistical costs.

Third, the ORD should consider actual buying operations only if these purchases are meant to promote a new variety or crop. The E-ORD must then stand ready to subsidize part of the marketing cost of the new crop until stable (private) market channels develop. If there should be no proven market access in sight, then such a new crop should not be introduced. For example, soybeans were introduced in the past without a proven market. The first year the E-ORD bought the crop for a good price to producers. But the next year, the price was cut in half and the third, the E-ORD ceased to buy the crop. Such an experience contributes only to develop further producers' mistrust toward the E-ORD.

8.3.4 The Role of OFNACER

Given that in the E-ORD the back-flow of grain is not well structured and that there is no strong evidence of distress sales at harvest, OFNACER may want to reconsider its concentrated purchases at harvest for export outside the region. For example, OFNACER can emphasize more than in the past to reach back to rural consumers in the E-ORD. At present, OFNACER sales to these consumers are limited only to times of crisis and take place only at important centers. To reach consumers in remote areas, OFNACER may play the role of wholesalers and rely on private retailers who have closer contacts with these consumers.

Second, OFNACER can play an important role by researching areas of marketing improvement and by assisting private traders in the adoption of these improved techniques, possibly in the areas of bookkeeping and logistical cost control practices. In effect, OFNACER would be extending services to private traders the way the E-ORD extension agents are supposed to assist farmers. At present, unfortunately, OFNACER itself lacks the managerial know-how to pass it to traders. A training program along these lines for OFNACER agents could be undertaken.

There is need for better information to estimate the full costs and benefits to all concerned participants from OFNACER actual purchases in order to recommend in which areas at the farm gate or at marketplaces, OFNACER should concentrate its purchases. In most areas, OFNACER farm gate grain purchases are welcomed by producers because the official price is higher than market prices at harvest. But OFNACER operational costs are likely to be higher than private traders' agent network operations. Many traders benefit also from OFNACER marketplace purchases. These traders gain access to working capital and thus expand their scale of

operations in remote areas to providing better opportunities to producers. In these marketplace purchases, OFNACER's logistical costs are reduced, but producers receive somewhat less than the official in order for traders to cover marketing costs.

8.3.5 The Village Cereal Bank Program

In some areas producers face food shortages in the hungry season. The objective of the Village Cereal Bank should be more sharply defined to help fulfill this need of food availability. But since different members value this need differently, proper screening of the Village Cereal Bank membership will be needed to increase adherence to that single objective. Also, no Village Cereal Bank should be established if the members have no willingness to pay for part of the scheme. This will insure that members will regard the grain stored as theirs rather than the ORD's. Furthermore, if a loan is to be provided, it should be given on the basis of the village group membership.

OFNACER and the E-ORD assistance will be crucial to insure a viable Village Cereal Bank. What is needed most is better management and control, awareness of overall logistical costs, and a mechanism for selling stored products in reliable markets outside the village should no effective demand materialize from local rural residents.

The E-ORD management could help Village Cereal Bank members set criteria that would indicate (preferably before the rainy season) whether there would be enough local demand for the grain of the Village Cereal Bank. OFNACER or private traders may be contacted then to buy off the stock in order to avoid potential heavy storage losses when the grain is stored over the rainy season. Alternatively, storage rooms could be

built so that the grain can be kept for two full years with minimum damage should the early warning signal fail and roads be made impassable in the rainy season. However, this option would be much more expensive and require ample justification.

8.3.6 Standardization of Measurement

Standardization of measurement can be promoted by OFNACER and the ORD in the E-ORD through the following measures: First, public officials should provide standardized volume measures with appropriate subunits. For example, 10-liter, two-liter, and one-liter tines should be made available to replace "Yoruba plates" and small calebash. Second, promotional campaign should be conducted in key marketplaces and days to demonstrate the superior reliability and trustworthiness of the standardized units over the nonstandardized ones. Third, steps should be taken to enforce the use of standardized measures. Traders should be required to use the standardized measure. Deliverance of license or registration of trader could be made subject to the possession of the devices. Also, the traders' union may be requested to help enforce the measure.

The recommended actions command a rethinking of the relationship between public officials and private traders. In many instances, public officials cooperate, if only reluctantly, with the private sector. This cooperation should be more emphasized by public officials. They should seize the opportunity to work with private traders to help find ways to police the trade and enforce contracts. OFNACER and the E-ORD management, in their respective domains, should consider taking the lead to do this.

8.4 Further Research Needs

This study has increased the understanding of the food grain marketing system in E-ORD. It is hoped that this understanding will be a useful comparative ground for the USAID/CRED food grain marketing study currently underway in Upper Volta. But this understanding remains only a part of the overall system picture referred to in Chapter 1; hence, more extensive understanding of the whole system is needed. For example, we need better estimates of the flows of grain through the various distribution channels and an assessment of the degree of coordination and efficiency in these channels.

Further detailed information is needed in the area of storage at the farm level and by private traders. Storage at the farm level has obvious implications for the Village Cereal Bank scheme. For how long, under which storage conditions, and how much can farmers keep grain in storage as a security against future food shortages? In areas where farm level storage is adequate, the Village Cereal Bank will not be needed as a reserve scheme. Storage conditions at the private merchant level have also to be examined in connection with the Village Cereal Bank and the back-flow of grain to rural consumers.

Further detailed information is needed also in the area of marketing costs incurred by private traders and public agencies. Such information is needed to determine the best combination of OFNACER intervention in the E-ORD, and to determine acceptable marketing margins charged by OFNACER and private traders. These studies should be accompanied by an in-depth analysis of public and private enterprise management in the E-ORD to identify cost-saving practices.

Finally, there is a need for long-term gathering of key important statistics in the E-ORD. Producer and consumer prices in key producing and consuming areas are still sorely lacking in E-ORD. Also, the efforts of the 1980 village inventory census should be pursued to update the socioeconomic information it provided.

The design of further marketing studies to be conducted in E-ORD should be built around the following major points emphasized by this study. It is important to properly identify merchants' agents in the village studied. Figures of volume exchanged cannot be accurately estimated by relying only on transactions that take place at marketplaces. In order to follow producers' disposals of grain, the research should extend over 15 to 18 months to cover one production and one marketing season. And an attempt should be made to measure beginning and ending stock. It will not be possible to abandon totally the cost-route approach, except in measuring production, seed used, and storage. The overall approach should emphasize the identification and diagnosis of unexploited economic opportunities and barriers, and the identification and analysis of behavioral and institutional changes to improve the performance of the marketing system. At the farm level, the behavior of producers should be studied in the context of the overall farming system.

APPENDIX A

APPENDIX A

PHYSICAL DISTRIBUTION COSTS OF GRAIN MERCHANTS OPERATING IN EASTERN UPPER VOLTA: AN ILLUSTRATION

A.1 Local Independent Trader (LIT)

The physical distribution costs are illustrated for actual LITs located in Namounou. But by looking into three different cases we can cover reasonably well the major roles of LITs in the Eastern ORD. In case one, the LIT buys in other markets and sells to larger traders at Namounou. In case two, he buys at Namounou and sells there to larger traders. In case three, he buys grain at Namounou and stores it for resale later in the rainy season.

A.1.1 Case 1

The representative market outside Namounou is taken to be Logobou, a weekly market open on Wednesdays, located behind the Gobnagou hill range at 45 kilometers or so from Namounou at the other end of the road Namounou-Logobou that USAID was then helping to upgrade. At Logobou, the LIT is helped by teenage boys who bring him sellers and bag the grain in 100 kg. bags for FCFA 50 a bag. The merchant buys grain until dawn and hauls it to a friend or the transporter's compound for the donkey cart owner to carry it to Namounou for the Sunday market day.

Hauling the grain from the market stall to the warehouse costs FCFA 25 per 100 kg. bag. Overseeing the grain costs another FCFA 25 per 100 kg. bag regardless of the period over which the grain is stored. There

are no specific charged for loading onto the cart or unloading off it and one may assume that they are included in the transport charges. The out-of-pocket costs for such an operation are presented in Table A.1.

A.1.2 Case 2

The representative LIT located at Namounou Market is well known enough to attract grain sellers without the help of teenage boys. Since the grain is sold immediately at Namounou to larger traders, out-of-pocket costs involve only bagging (FCFA 25 per 100 kg. bag) and the user cost of the bag (FCFA 83 per 100 kg. bag) for a total of FCFA 108 per 100 kg. bag.

A.1.3 Case 3

The LIT buys grain at Namounou as in Case 2, but stores a few bags for resale during the rainy season (only a few bags are set aside because the LIT cannot afford to tie up more capital. We will assume that 10 bags will have been set aside by November, that the stock is kept from November to May, and that retail sales are uniform from June to October. Under these assumptions, 10 bags are held in storage for seven months, an average of five bags are held for five months, and for the year, the (weighted) average stock is eight (100 kg.) bags. Alternatively, a bag stays an average of eight-tenths of 12 months in storage. The costs for such an operation are presented in Table A.2.

A.2 Regional Wholesaler-Retailer (RWR)

The representative RWR considered is a small merchant who has thus far gained access to grain trading through a USAID-sponsored loan program which aims at promoting local entrepreneurs. He buys grain at Namounou from LITs, transports it on regular line trucks to Fada, and

Table A.1

Estimated Physical Distribution Costs (Small Merchant Operating at Namounou and Logobou)

Cost Components	Cost (FCFA per 100 kg. Bag)	Total Cost (FCFA per 100 kg. Bag)	Percent of Total Cost
Handling		158	16.9
Hauling to warehouse	25		
Bagging[a]	50		
Use of bag[b]	83		
Transportation		750	80.4
Grain[c]	750		
Storage		25	2.7
Use of facility	25		
Losses[d]	--		
Cost of capital[d]	--		
Total Cost:		933	100.0

Source: 1980 Marketing Investigation.

[a]Teenage boys are paid for bagging and helping bring sellers to LIT.

[b]A 100 kg. bag costs FCFA 250 and has been assumed to be reusable three times.

[c]Donkey cart charge is on a bag basis in the Namounou area. They include loading and unloading

[d]There are only four days between Logobou's market day (Wednesday) and Namounou's (Sunday); cost of capital and value of storage losses are very insignificant during this period.

Table A.2

Estimated Physical Distribution Costs (Small Merchant With Storage at Namounou)

Cost Components	Cost (FCFA per 100 kg. Bag)	Total Cost (FCFA per 100 kg. Bag)	Percent of Total Cost
Handling		133	12.7
Bagging	25		
Hauling to warehouse	25		
Use of bag	83		
Storage		913	87.3
Use of facility[a]	20		
Cost of capital[b]	397		
Loss[c]	496		
Total Cost:		1,046	100.0

Source: 1980 Marketing Investigation.

[a]Prevailing storage space rent is FCFA 25 per bag, but average stock is eight-tenths

[b]Assumed opportunity cost of capital is 12 percent, assumed purchase price is FCFA 4,000 per bag, and the resulting total value of one bag in stock is FCFA 4,133. Therefore, capital cost for the average stock is: 4,133 * .12 * 8/10 = FCFA 397.

[c]Inventory costing uses "historical" rather than market (sale) prices. Here, however, the "historical" price is the purchase price plus costs of related services required to bring the grain to the warehouse. This is the same value upon which capital cost is computed. Hence, 4,313 * .15 * 8/10 = FCFA 496.

[d]Because total annual volume handled by the merchant is not known, tax cost per bag cannot be assessed and be included in the total cost.

sells it to urban consumers and women restaurateurs. His strategy is to achieve a high turnover thus taking advantage of regional price differential rather than speculating on seasonal price differential.

The RWR does not incur any buying costs since he buys from an assembler (LIT). Handling services include hauling, loading/unloading, and use of the bag. Transportation charges are FCFA 500 per bag from Namounou to Fada but in addition the merchant has to pay FCFA 1,000 round-trip passenger fare. (A nontrader would have paid FCFA 1,500 for the same service.) Grain transport charge is spread over 20 bags, a volume the trader secures on average on a trip. In association with two other merchants, the NWR has rented a tin-roofed 100 bag-capacity mud house at Fada market to store the grain. Sometimes for a couple of days a few bags are left outside the warehouse for lack of space, and also in the rainy season humidity may affect bags on the top layer (when the roof leaks) and bags in contact with the noncemented floor. The merchant estimates, however, that storage loss is insignificant because of the high turnover (20 bags over a 2-week period). The costs of such an operation are presented in Table A.3.

A.3 National Wholesaler-Retailer (NWR)

The representative NWR considered uses an agent network to collect grain at the farm gate in the Bassieri area where we have accounts of one commission agent who bought grain for a total value of three million FCFA on behalf of a large merchant from Ouagadougou. Here, however, only the costs related to the NWR's operations in the E-ORD, up to unloading in Ouagadougou will be estimated.

Table A.3

Estimated Physical Distribution Costs
(Small Regional Wholesaler-Retailer in Fada)

Cost Components	Cost (FCFA per 100-kg. Bag)	Total Cost (FCFA per 100-kg. Bag)	Percent of Total Cost
Handling		158	20.5
Hauling to truck	25		
Loading onto truck	25		
Unloading plus stacking	25		
Use of bag[a]	83		
Transportation		575	74.5
Grain	500		
Passenger[b]	75		
Storage		39	5.0
Use of facility[c]	17		
Cost of capital[d]	22		
Total Cost:[e]		772	100.0

Source: 1980 Marketing Investigation.

[a]See Table A.1.

[b]FCFA 1,000 spread over 20 bags on each trip.

[c]Monthly rent of 1/3 * FCFA 2,000 per merchant is spread over 20 bags held in storage for two weeks on average.

[d]Total value of one bag in stock is FCFA 4,733 assuming a purchase price of FCFA 4,000 per bag; 52 weeks make up a year.

[e]See Table A.2

The costs incurred by the NWR include the commission agent's fees (FCFA 250 per bag). They also include handling in which loading in Ouagadougou may cost four times as much as in the E-ORD. The transport charges include that for moving the grain from the farm gate to the bulking point by donkey cart, and that from moving the grain by truck from Bassieri (bulking point) to Ouagadougou via Piela. For lack of a better estimate, we will approximate the truck transport cost by the cost professional truckers charge for grain transport between Bassieri-Piela and Piela-Ouagadougou, even though the NWR uses his own truck. (It is important to note that large merchants buy trucks not only to attempt to save on transport costs but mostly to lower overall distribution costs by being on hand to take advantage of lower prices at harvest, by minimizing the risk of heavy physical losses that occur when rains fall early on the grain left in the open at the farm gate, and by making speedy delivery to take advantage of spatial price differential. That is, the availability and speed of transportation are as important as, if not more important than, the out-of-pocket cost of transportation). We will assume also that the NWR faces some losses in storage and possibly monetary losses.

The costs of such an operation are presented in Table A.4.

Table A.4

Estimated Physical Distribution Costs
(Large National Wholesaler-Retailer)

Cost Components	Cost (FCFA per 100 kg. Bag)	Total Cost (FCFA per 100 kg. Bag)	Percent of Total Cost
Buying		250	11.7
Commission fee	250		
Handling		233	10.9
Bagging	25		
Loading at village	25		
Unloading at Ouagadougou	100		
Use of bag	83		
Transportation		1,450	67.6
Assembly to bulk point[a]	150		
Truck[a]	1,300		
Storage		210	9.8
In village storage	25		
Capital cost[c]	131		
Losses[d]	55		
Total Cost:		2,144	100.0

Source: 1980 Marketing Investigation.

[a]Donkey cart cost per bag over a distance of less than or equal to 15 kilometers.

[b]Professional truckers charge FCFA 300 per bag from Bassieri to Piela and FCFA 1,000 per bag from Piela to Ouagadougou.

[c]The total value of grain in storage at the village includes the purchase price (FCFA 4,000), bagging (FCFA 25), the user-cost of the bag (FCFA 83), and the commission fee. Loading and unloading take place when the grain is leaving or has left the village.

[d]See inventory costing in Table A.2. 4,358 * .05 * 3/12 ≈ FCFA 55.

[e]See Table A.2.

APPENDIX B

APPENDIX B

KG CONVERSION FACTORS FOR SELECTED MILLET-SORGHUM MEASUREMENT DEVICES

Measurement Devices	Mean Kgs For Unthreshed Grain	Mean Kgs For Threshed Grain
Large straw basket	10.14	46.50
Small straw basket	7.75	31.75
Large wooden basket	7.50	40.35
Small wooden basket	6.30	30.10
ORD tine with "hat"	5.15	18.50
ORD tine without "hat"	4.70	16.90
Trader's tine	5.30	19.10
100 kg-bag	29.4	101.30
50 kg-bag	14.10	50.60
25 kg-bag	7.0	25.30
Large plate	8.0	27.65
"Yoruba" plate	.70	2.53
Large calebash	3.30	11.20
Medium calebash	1.60	5.60
Small calebash (louche)	.30	1.10
Large pail	-	12.80
Small pail	1.20	4.40
Scale (one kg)	.75	1.0

Source: 1978-79 farm survey. Derived from kg conversion computer subroutines.

APPENDIX C

APPENDIX C

EXAMPLES OF INTERNALLY INCONSISTENT PERIODIC STOCK ESTIMATES OF SORGHUM AND MILLET IN SELECTED VILLAGES

Village Tilonti[b] (Diapangou Zone)				Village Ougarou[c] (Ougarou Zone)			
ID Number[a]	September 78 Stock (kg)	December 78 Stock (After Harvest) (kg)	May 79 Stock (End of Survey) (kg)	ID Number[a]	September 78 Stock (kg)	December 78 Stock (After Harvest) (kg)	May 79 Stock (End of Survey) (kg)
1	543.0	0	305	1	1,014	405	1,517
2	0	672.0	101	2	303	15,273	13,101
3	51	31	0	3	0	30,106	6,892
4	25	340	25	4	14,204	958	11,896
5	202	0	1,133	5	101	3,497	2,618
6	n.a.	n.a.	n.a.	6	0	1,496	4,773
7	0	915	25	7	95	5,734	4,018
8	44	239	203	8	30	9,726	2,388
9	95	609	203	9	637	8,878	6,358
10	75	876	218	10	n.a.	n.a.	n.a.
11	848	485	203	11	38	1,679	2,641
12	1,258	1,676	405	12	303	11,188	10,322
13	253	0	304	13	303	1,619	1,117
14	449	227	709	14	115	1,807	1,909
15	0	118	115	15	101	1,012	607
16	41	61	79	16	101	506	267
17	38	548	203	17	0	3,520	725
18	157	0	88	18	174	68,949	66,037

APPENDIX C

(Continued)

Source: 1978-79 farm survey.

[a]There are 18 selected households per village.

[b]A traditional farming village.

[c]An animal traction village.

APPENDIX D

APPENDIX D

PRODUCERS' ESTIMATES OF DAILY GRAIN CONSUMPTION (ONE-THIRD OF 1978-79 FARM SURVEY SAMPLE)

Table D.1

Daily Consumption at Four Different Points in Time

	May		August		September		January	
	ANTRAC	TRAD	ANTRAC	TRAD	ANTRAC	TRAD	ANTRAC	TRAD
Kgs per Household	6.154	4.599	6.352	4.498	6.677	4.979	6.546	4.536
Kgs per Member	.527	.578	.544	.566	.572	.626	.560	.571

Table D.2

Daily Consumption According to Number of Days Planned for Consumption

Number of Days	Average Kgs per Household
1	5.439
2	4.883
3	6.083
4	4.775
6	1.602
7	4.578
8	1.200
10	1.910
12	1.592
15	1.273
30	6.460
Total	5.478

Source: 1978-79 Farm Survey.

APPENDIX E

SOURCES AND USES OF SORGHUM AND MILLET IN SELECTED ANTRAC ZONES

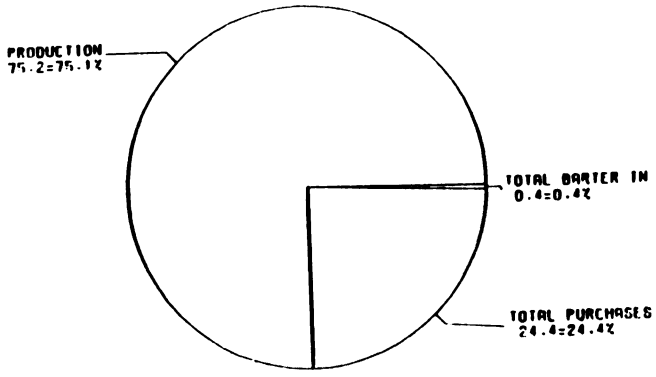


Figure E.1a

Sources of Sorghum and Millet
(Carry Over Stocks Not Included)

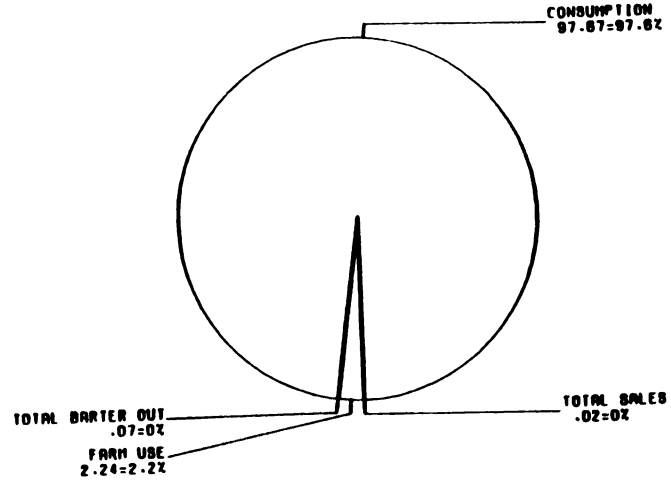


Figure E.1b

Uses of Sorghum and Millet
(Ending Stocks Not Included)

Source: 1978-79 Farm Survey.

Figure E.1

Sources and Uses of Sorghum and Millet in Piela Zone

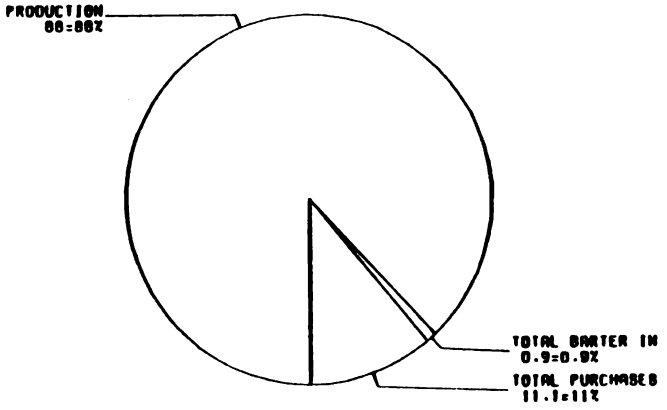


Figure E.2a

Sources of Sorghum and Millet
(Carry Over Stocks Not Included)

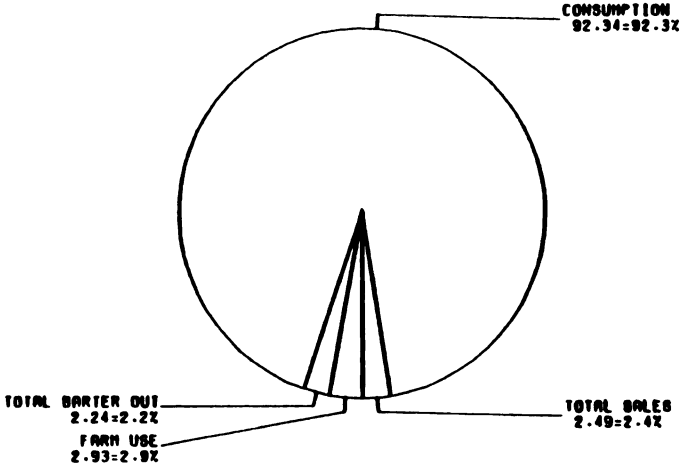


Figure E.2b

Uses of Sorghum and Millet
(Ending Stocks Not Included)

Source: 1978-79 Farm Survey.

Figure E.2

Sources and Uses of Sorghum and Millet in Lantaogo Zone

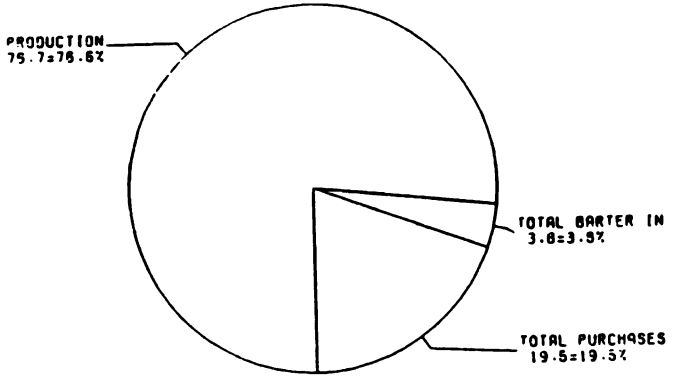


Figure E.2a

Sources of Sorghum and Millet
(Carry Over Stocks Not Included)

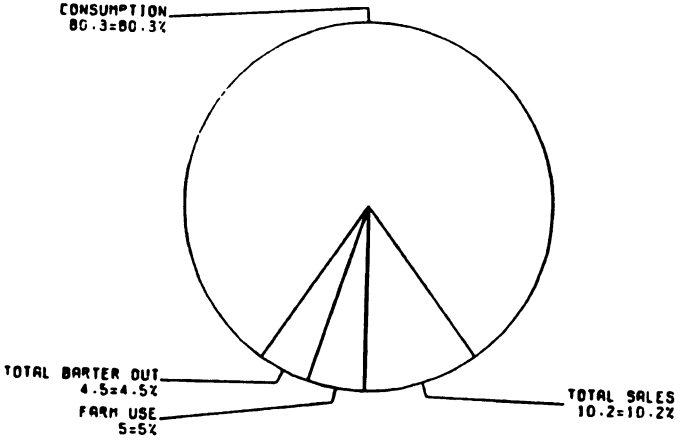


Figure E.2b

Uses of Sorghum and Millet
(Ending Stocks Not Included)

Source: 1978-79 Farm Survey.

Figure E.3

Sources and Uses of Sorghum and Millet in Logobou Zone

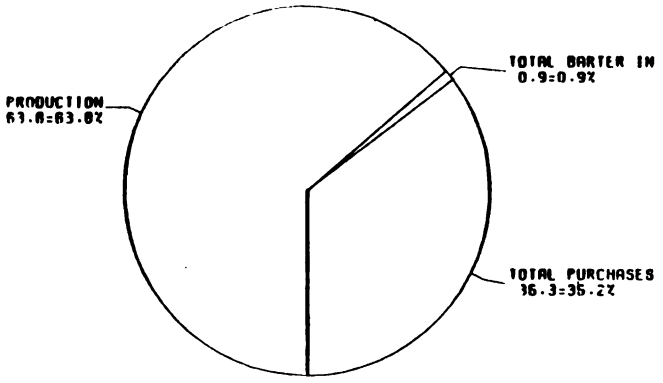


Figure E.4a

Sources of Sorghum and Millet
(Carry Over Stocks Not Included)

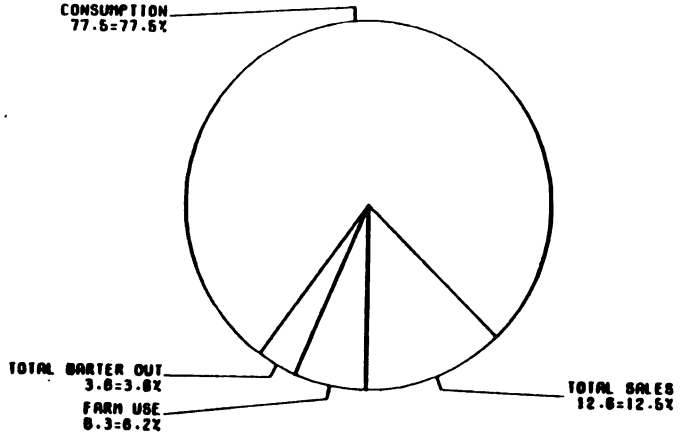


Figure E.4b

Uses of Sorghum and Millet
(Ending Stocks Not Included)

Source: 1978-79 Farm Survey

Figure E.4

Sources and Uses of Sorghum and Millet in Diapangou Zone

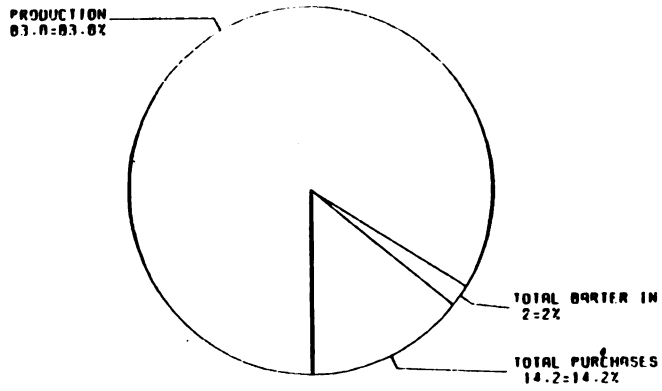


Figure E.5a

Sources of Sorghum and Millet
(Carry Over Stocks Not Included)

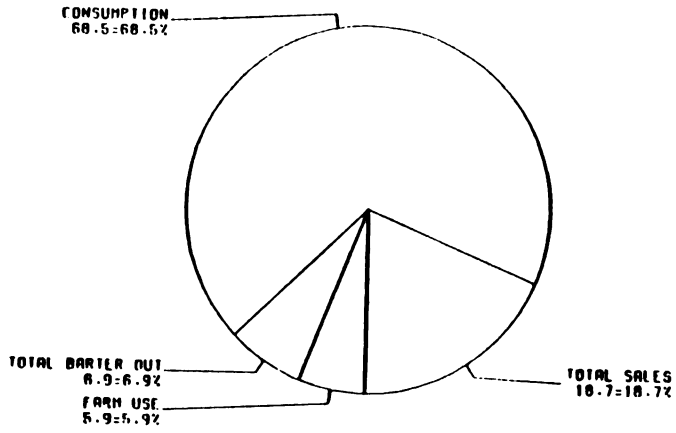


Figure E.5b

Uses of Sorghum and Millet
(Ending Stocks Not Included)

Source: 1978-79 Farm Survey.

Figure E.5

Sources and Uses of Sorghum and
Millet in Ougarou Zone

APPENDIX F

APPENDIX F

FARMERS' RECALL OF THE 1978 GRAIN CROP USES (IN PERCENT OF TOTAL PRODUCTION)

Items	Piela Zone		Lantaogo Zone		Logobou Zone		Diapangou Zone		Ougarou Zone		All Zones	
	ANTRAC	TRAD	ANTRAC	TRAD	ANTRAC	TRAD	ANTRAC	TRAD	ANTRAC	TRAD	ANTRAC	TRAD
Sales	0.0	0.0	0.6	3.2	0.4	3.2	0.0	1.9	2.8	8.0	0.7	3.1
Barter Exchange	0.0	0.0	19.3	16.8	7.3	6.3	0.8	0.0	3.0	3.9	7.1	6.5
Consumption	68.0	69.3	35.9	27.4	66.3	65.3	48.1	57.1	23.9	23.6	48.9	52.2
Ending Inventory	32.0	30.7	44.2	52.6	26.0	25.2	51.1	41.0	70.3	64.5	43.3	38.2
Total Used Up	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: 1978-79 Farm Survey (end of season recall).

[a]Percent computed as $\bar{x}_k = 100 * \frac{\sum_{j=1}^{m} \sum_{i=1}^{n} x_{kij}/Q_{ij}}{N}$

where j = 1, -- m crops (millet, sorghum, sorghum + millet)

c = 1, -- n number of households per zone and per farming system

N = m + n

k = 1, 2, 3, 4 uses = sales, barter, consumption, stock

x = uses in local unit

Q = crop production in same local units as uses.

APPENDIX G

APPENDIX G

SEASONAL GRAINFLOW STATEMENT AND PERFORMANCE MEASURES FOR ANTRAC AND TRADITIONAL HOUSEHOLDS (SELECTED ANTRAC ZONES)

Flow Items (Average kg By Household)	Before Harvest		Harvest		After Harvest		Yearly Total	
	May 1-Sept. 3, 78		Sept. 4-Dec. 31, 78		Jan. 1-April 30, 79		May 1-April 30, 79	
	ANTRAC	TRAD	ANTRAC	TRAD	ANTRAC	TRAD	ANTRAC	TRAD
Sources of Grain								
Household Purchases	190.7	107.1	120.3	29.2	118.3	43.0	429.3	179.3
Trade Purchases	21.4	0.4	80.8	19.4	102.3	9.7	204.5	29.5
Processing Purchases	9.3	7.2	18.9	12.0	17.6	7.0	45.8	26.2
Total Purchases	221.4	114.7	220.0	60.6	238.2	59.7	679.6	235.0
Gifts Received	3.1	5.6	8.2	9.7	2.1	1.6	13.4	16.9
Borrowing	2.6	3.6	0.0	2.1	0.0	2.8	2.6	8.5
Loan Repayment	0.0	0.0	14.5	31.5	0.4	9.5	14.9	41.0
Wages	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5
Total Barter Inflow	5.7	9.2	22.7	43.8	2.5	13.9	30.9	66.9
Total Exchange Inflow	227.1	123.9	242.7	104.4	240.7	73.6	710.5	301.9
Production	0.0	0.0	2,045.9	1,659.0	0.0	0.0	2,045.9	1,659.0
Total Sources	227.1	123.9	2,288.6	1,763.4	240.7	73.6	2,756.4	1,960.9
Uses of Grain								
Farm Sales	12.5	23.4	11.0	33.3	28.5	66.9	52.0	123.6
Trade Sales	29.2	11.4	3.9	12.7	99.0	14.4	132.1	38.5
Processing Sales	9.3	7.2	18.9	12.0	17.6	7.0	45.8	26.2
Total Sales	51.0	42.0	33.8	58.0	145.1	88.3	229.9	188.3
Gifts Given	19.1	14.8	24.0	46.3	12.6	4.9	55.7	66.0
Loans Extended	6.1	0.5	2.2	2.9	0.1	0.2	8.4	3.6
Debt Repayment	0.0	0.0	1.6	7.8	0.0	3.0	1.6	10.8
Hired Labor	0.2	0.0	0.4	1.5	0.3	0.0	0.9	1.5
Work "Invitations"	5.1	4.5	1.3	1.1	0.9	0.0	7.3	5.6
Total Barter Outflow	30.5	19.8	29.5	59.6	13.9	8.1	73.9	87.5
Total Exchange Outflow	81.5	61.8	63.3	117.6	159.0	96.4	303.8	275.8
Seed	43.1	33.2	0.9	0.0	0.0	0.0	43.1	33.2
Feed	38.4	13.1	33.7	8.6	28.6	8.0	100.7	29.7
Total Farm Use	81.5	46.3	33.7	8.6	28.6	8.0	143.8	62.9
Consumption (Estimated)	830.6	622.5	499.4	374.3	651.5	488.3	1,981.5	1,485.1
Farm-Family Use	912.1	668.8	533.1	382.9	680.1	496.3	2,125.3	1,548.0
Total Sales	993.6	730.6	596.4	500.5	839.1	592.7	2,429.1	1,823.8
Change in Stock	-766.5	-606.7	1,692.2	1,262.9	-598.4	-519.1	327.3	137.1
Performance Measures (In Percent)								
Farm Sales/Household Purchases	6.5	21.8	9.1	114.0	24.1	155.6	12.1	68.9
Total Sales/Total Purchases	23.0	36.6	15.4	95.7	60.9	147.9	33.8	80.1
Barter Inflow/Household Purchases	3.0	8.6	18.9	150.0	2.1	32.3	7.2	37.3
Barter Outflow/Farm Sales	244.0	84.6	268.2	179.0	48.8	12.1	142.1	70.8
Total Sales/Exchange Outflow	62.6	68.0	53.4	49.3	91.3	91.6	75.7	68.3
Exchange Outflow/Total Uses	8.2	8.4	10.6	23.5	18.9	16.3	12.5	15.1

Source: 1978-79 Farm Survey

APPENDIX H

APPENDIX H

CHANGES IN STOCK AND MARKETED SURPLUS UNDER ALTERNATIVE GRAIN CONSUMPTION REQUIREMENTS

Annual Grain Consumption Per Capita (kg)	Daily Grain Consumption Per Capita (kg)	ANTRAC Households		HOE Households	
		Stock Change (kg)	Marketable Surplus (kg)	Stock Change (kg)	Marketable Surplus (kg)
165[a]	.452	434.2	27.8	217.2	191.3
170	.466	377.4	-29.0	174.7	148.7
175[b]	.479	327.1	-79.4	136.9	111.0
180	.493	263.9	-142.6	89.5	63.6
185	.507	207.1	-199.4	47.0	21.0
190[c]	.520	150.3	-256.2	4.4	-21.6
195	.534	93.5	-313.0	-38.2	-64.1
200	.548	36.7	-369.8	-80.7	-106.7

Source: 1978-79 Farm Survey.

[a] Turning point of ANTRAC households' marketable surplus.

[b] Base run in grain flow analysis.

[c] Turning point of HOE households' stock change and marketable surplus.

APPENDIX I

APPENDIX I

SEASONAL GRAIN MARKETED AND MARKETABLE SURPLUS BY TECHNOLOGY IN SELECTED ZONES (AVERAGE KG PER HOUSEHOLD)

	Pre Harvest		Harvest		Post Harvest		Total Year	
	ANTRAC	TRAD	ANTRAC	TRAD	ANTRAC	TRAD	ANTRAC	TRAD
Marketed Surplus[a]	-170.4	-72.7	-186.2	-2.6	-93.1	28.6	-449.7	-46.7
Net Barter Outflow[b]	24.8	10.6	6.8	15.8	11.4	-5.8	43.0	20.6
Net Exchange Outflow[c]	-145.6	-62.1	-179.4	13.2	-81.7	22.8	-406.7	-26.1
Stock Change[d]	-766.5	-606.7	1,692.2	1,262.9	-598.4	-519.1	327.3	137.1
Marketable Surplus[e]	-912.1	-668.8	1,512.8	1,276.1	-680.1	-496.3	-79.4	111.0

Source: 1978-79 Farm Survey.

[a,b,c,d,e]See Table 6.6

APPENDIX J

APPENDIX J

RELATIONSHIP BETWEEN ACTUAL GRAIN TRANSACTIONS AND LEVEL OF TECHNOLOGY, ECOLOGICAL ZONES, MARKET, AND ROAD

Actual Grain Transactions Patterns[a]	Distribution of Households With Respect to (Percent)[f]										
	Technology[b]		Zones[c]					Market[d]		Location[e]	
	ANTRAC	TRAD	Piela	Lantao-go	Logou-bou	Dia-pangou	Ouga-rou	Market	No Market	On Road	Off Road
No Transactions	42.9	57.1	21.4	32.1	7.1	35.7	3.6	46.4	53.6	39.3	60.7
Household Purchases Only	52.5	47.5	29.3	19.2	28.3	11.1	12.1	60.6	39.4	19.2	80.8
Farm Sales Only	21.1	78.9	0.0	5.3	42.1	36.8	15.8	42.1	57.9	36.8	63.2
Both Farm Sales and Household Purchases	42.0	58.0	2.0	14.0	30.0	16.0	38.0	52.0	48.0	32.0	68.0
Number of Households	89	107	36	36	53	36	35	107	89	55	143

Source: 1978-79 Farm Survey

APPENDIX J

(Continued)

[a] Exclude sorghum and millet sales and purchases for trade and processing purposes.

[b] Chi-square = 6.887 Degrees of Freedom = 3 Significance Level = .0759

[c] Chi-square = 56.036 Degrees of Freedom = 12 Significance Level = .00001

[d] Chi-square = 3.528 Degrees of Freedom = 3 Significance Level = .3172

[e] Chi-square = 6.768 Degrees of Freedom = 3 Significance Level = .0797

[f] Row percentages add up to 100 in each criterion of stratification.

APPENDIX K

APPENDIX K

MONTHLY AVERAGE FARMGATE PRICES ESTIMATED FROM OBSERVATIONS OF REDUCED SAMPLE (196 Households) IN ANTRAC ZONES (Without Trimming)

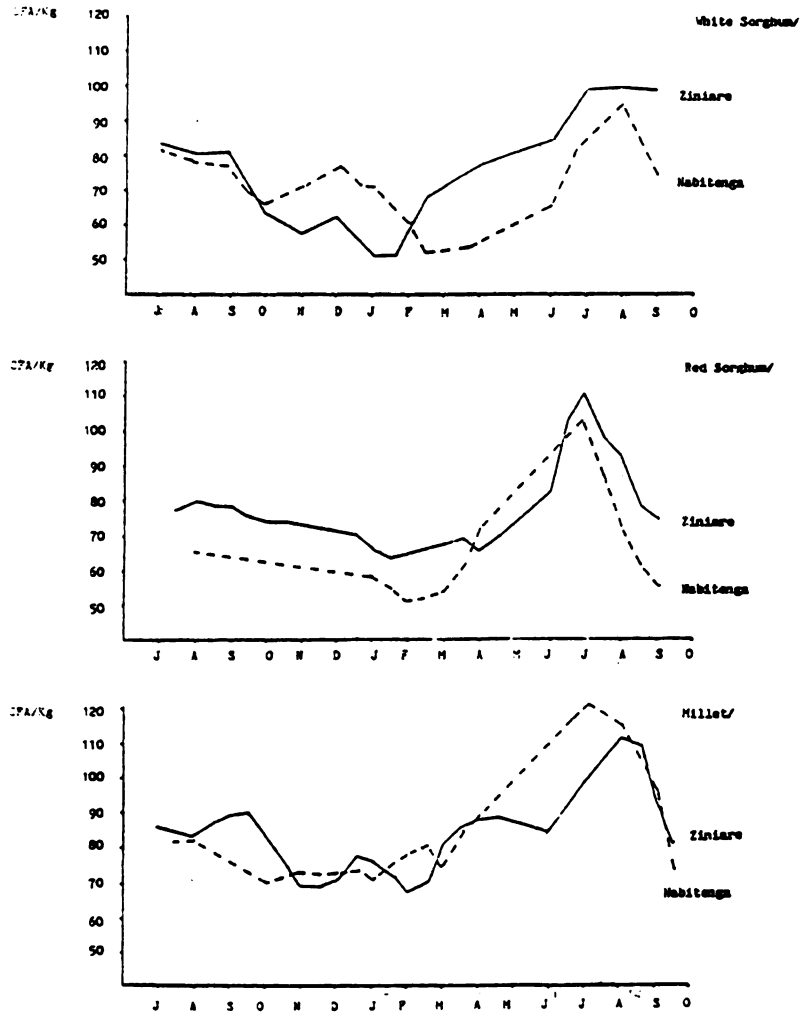
"Month"	Price Received	Price Paid
	FCFA/Kg	FCFA/Kg
May 1-May 28	47.7	55.4
May 29-June 25	64.2	55.9
June 26-July 23	61.5	43.7
July 24-August 20	56.3	51.6
August 21-September 17	51.3	41.2
September 18-October 15	41.9	50.6
October 16-November 12	34.5	55.0
November 13-December 10	34.5	39.4
December 11, 78-January 7, 79	35.0	35.9
January 8-February 4	38.6	46.6
February 5-March 4	38.9	42.2
March 5-April 1	44.3	49.9
April 2-April 30	41.3	46.1

Source: 1978-79 Farm Survey

APPENDIX L

APPENDIX L

RETAIL PRICES FOR SORGHUM AND MILLET BY MONTH IN ZINIARE AND NABITENGA, 1980-81 (CALCULATED AS MOVING SIX WEEK AVERAGE)



Source: A. Bonkian (1982).

APPENDIX M

MONTHLY CASH FLOWS

Table M.1

Monthly Cash Flow and Performance Measures For ANTRAC Households

Cash Flow Items	May 1-May 28 1978	May 29-June 25 1978	June 26-July 23 1978	July 24-Aug 20 1978	Aug 21-Sept 17 1978	Sept 18-Oct 15 1978	Oct 16-Nov 12 1978	Nov 13-Dec 10 1978	Dec 11-Jan 7 1979	Jan 8-Feb 4 1979	Feb 5-March 4 1979	March 5-Apr 1 1979	Apr 2-Apr 30 1979	Year 1978-79
Sources of Cash (Revenues From)	5,732	14,057	14,751	8,111	18,234	25,466	11,399	22,908	17,979	6,770	9,267	13,057	21,341	189,073
Crop Sales	746	1,322	376	500	950	479	886	665	1,121	856	688	2,923	944	12,455
Farm Services	71	85	107	44	37	49	33	122	172	24	28	79	78	929
Agricultural Trading	348	1,235	927	368	219	967	555	2,110	17	1,410	1,569	1,603	3,208	14,535
Agricultural Processing and Gathering	157	607	302	152	836	311	447	589	583	517	752	1,441	1,402	8,096
Livestock Raising	1,092	5,988	9,189	869	10,470	14,480	2,967	14,308	12,960	605	303	2,720	10,639	86,589
Credit (Borrowing and Reimbursements)	359	921	1,199	722	743	4,261	2,753	889	434	415	763	623	1,284	15,366
Other Sources	2,959	3,900	2,651	5,455	4,980	4,919	3,758	4,227	2,692	2,943	5,164	3,668	3,787	51,103
Uses of Cash	13,070	7,461	13,023	11,661	14,538	10,687	18,851	19,437	8,365	9,194	14,375	12,114	12,513	165,289
Cropping (Inputs and Services)	1,063	582	664	832	205	318	236	124	25	104	48	91	219	4,511
Agricultural Trading	802	120	611	687	1,657	969	1,951	3,752	711	989	991	3,306	1,808	18,354
Agricultural Processing and Gathering	274	404	424	222	913	563	242	484	399	612	654	659	245	6,095
Livestock Raising	3,645	3,233	5,102	4,018	8,176	6,807	9,828	8,250	4,291	3,363	7,604	4,360	3,474	72,151
Credit (Loans and Repayments)	1,804	534	2,038	711	625	746	1,924	2,457	1,178	2,172	1,448	1,342	3,266	20,245
Equipment (ANTRAC)	102	308	302	112	652	69	11	0	55	1	6	36	338	1,992
Foodstuffs	4,302	1,553	2,439	997	634	701	968	2,531	1,591	1,018	1,399	1,337	1,923	21,393
Other Uses	1,078	727	1,443	4,082	1,676	514	3,691	1,839	115	935	2,225	983	1,240	20,548
Net Cash Flow	-7,338	6,597	1,728	-3,550	3,696	14,779	-7,452	3,471	9,614	-2,424	-5,108	943	8,828	23,784
Net Cropping Cash Surplus (NCCS)[a]	-5,632	-1,156	-3,074	-1,446	-10	-566	-397	-2,298	-510	-352	-957	1,346	-1,357	-16,409
Crop Sales/Sources of Cash (Percent)	13.0	9.4	2.5	6.2	5.2	1.9	7.8	2.9	6.2	12.6	7.4	22.4	4.4	6.6
Animal Revenues/Sources of Cash (Percent)	19.0	42.6	62.3	10.7	57.4	56.9	26.0	62.4	72.1	8.9	3.3	20.8	49.8	45.8
Food Purchases/Uses of Cash (Percent)	32.9	20.8	18.7	8.5	4.4	6.6	5.1	13.0	19.0	11.0	9.7	11.0	10.7	12.9

Source: 1978-79 Farm Survey

[a] Net Cropping Cash Surplus is net cropping cash revenues less foodstuffs expenditures.

Table M.2

Monthly Cash Flow and Performance Measures for HOE Households

Cash Flow Items	May 1-May 28 1978	May 29-June 25 1978	June 26-July 23 1978	July 24-Aug 20 1978	Aug 21-Sept 17 1978	Sept 18-Oct 15 1978	Oct 16-Nov 12 1978	Nov 13-Dec 10 1978	Dec 11-Jan 7 1979	Jan 8-Feb 4 1979	Feb 5-March 4 1979	March 5-Apr 1 1979	Apr 2-Apr 30 1979	Year 1978-79
Sources of Cash (Revenues From)	4,364	3,575	5,037	3,778	2,609	2,678	4,298	2,665	3,919	4,341	3,257	9,228	4,883	54,632
Crop Sales	1,051	338	761	475	203	406	542	943	1,245	1,083	551	1,823	884	10,305
Farm Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Agricultural Trading	1,363	694	1,137	446	831	215	123	219	263	561	292	1,082	300	7,526
Agricultural Processing and Gathering	138	252	65	190	106	319	185	118	288	86	420	317	265	2,749
Livestock Raising	1,135	1,540	1,273	1,131	576	740	2,257	203	952	1,533	705	1,286	1,102	14,432
Credit (Borrowing and Reimbursements)	114	254	239	450	243	378	400	189	602	233	330	425	1,049	4,906
Other Sources	563	497	1,562	1,086	650	620	791	994	569	845	959	4,295	1,283	14,714
Uses of Cash	3,938	3,420	4,533	2,703	2,756	2,686	4,747	2,667	4,567	2,110	2,654	1,358	3,819	41,958
Cropping (Inputs and Services)	727	539	515	220	149	85	119	83	161	36	49	65	125	2,872
Agricultural Trading	54	256	15	278	85	377	1,246	1,270	1,459	458	353	19	490	6,360
Agricultural Processing and Gathering	80	116	126	55	57	150	122	221	83	205	106	54	27	1,402
Livestock Raising	1,081	660	1,447	785	707	891	1,723	354	700	462	857	582	765	11,014
Credit (Loans and Repayments)	526	746	451	355	373	337	482	304	765	582	529	74	1,636	7,160
Equipment (ANTRAC)	0	75	12	0	0	0	418	0	0	0	0	0	0	505
Foodstuffs	1,132	958	1,535	636	1,000	746	324	267	486	326	329	381	641	8,761
Other Uses	338	70	432	374	396	100	313	168	913	41	431	183	135	3,884
Net Cash Flow	426	155	504	1,075	-147	-8	-449	-2	-648	2,231	603	7,870	1,064	12,674
Net Cropping Cash Surplus (NCCS)[a]	-808	-1,161	-1,289	-392	-945	-424	100	592	599	721	173	1,376	118	-1,340
Crop Sales/Sources of Cash (Percent)	24.1	9.4	15.1	12.6	7.8	15.2	12.6	35.4	31.8	25.0	16.9	19.8	18.1	18.9
Animal Revenues/Sources of Cash (Percent)	26.0	43.1	25.3	29.9	22.1	27.6	52.5	7.6	24.3	35.3	21.6	13.9	22.6	26.4
Food Purchases/Uses of Cash (Percent)	28.7	28.0	33.8	23.5	36.3	27.7	6.8	10.0	10.6	15.4	12.4	28.0	16.8	20.9

Source: 1978-79 Farm Survey

[a] Net Cropping Cash Surplus is net cropping cash revenues less foodstuffs expenditures.

Table M.3

Monthly Cash Flow and Performance Measures for Households With No Grain Transactions

Cash Flow Items	May 1-May 28 1978	May 29-June 25 1978	June 26-July 23 1978	July 24-Aug 20 1978	Aug 21-Sept 17 1978	Sept 18-Oct 15 1978	Oct 16-Nov 12 1978	Nov 13-Dec 10 1978	Dec 11-Jan 7 1979	Jan 8-Feb 4 1979	Feb 5-March 4 1979	March 5-Apr 1 1979	Apr 2-Apr 30 1979	Year 1978-79
Sources of Cash (Revenues From)	3,482	8,799	4,597	7,131	4,026	4,391	10,047	23,703	3,952	4,987	8,061	6,635	3,564	93,375
Crop Sales	218	2,321	573	963	71	89	670	63	89	125	0	127	189	5,498
Farm Services	0	18	36	0	0	0	0	0	0	0	0	0	0	54
Agricultural Trading	161	1,714	879	732	321	0	714	982	0	0	0	20	0	5,523
Agricultural Processing and Gathering	51	464	11	28	24	111	194	412	628	479	326	64	0	2,792
Livestock Raising	388	143	256	1,330	70	661	4,673	18,036	136	1,325	500	3,150	678	31,346
Credit (Borrowing and Reimbursements)	36	376	0	270	636	536	24	602	236	107	89	143	121	3,236
Other Sources	2,628	3,763	2,842	3,808	2,844	2,994	3,772	3,608	2,863	2,951	7,146	3,131	2,576	44,926
Uses of Cash	3,250	2,757	3,206	2,950	7,593	3,761	5,640	3,206	1,496	3,150	11,511	8,844	5,040	62,409
Cropping (Inputs and Services)	393	498	362	643	140	82	121	30	7	6	96	121	161	2,660
Agricultural Trading	79	143	1,482	1,149	2,179	89	670	1,580	318	0	0	71	2,250	10,010
Agricultural Processing and Gathering	36	337	9	0	0	200	27	288	340	498	139	48	0	1,922
Livestock Raising	698	371	482	339	2,770	3,243	410	427	239	243	9,911	7,411	2,057	28,601
Credit (Loans and Repayments)	821	411	504	16	811	143	729	177	439	157	24	557	304	5,093
Equipment (ANTRAC)	89	367	0	0	232	0	0	0	-	0	0	0	0	688
Foodstuffs	0	0	89	107	32	4	435	0	23	5	18	368	0	1,081
Other Uses	1,134	630	278	696	1,434	0	3,248	704	130	2,241	1,323	268	268	12,354
Net Cash Flow	232	6,042	1,391	4,181	-3,572	630	4,407	20,497	2,456	1,837	-3,450	-2,209	-1,476	30,966
Net Cropping Cash Surplus (NCCS)[a]	-633	1,506	-283	106	-139	-112	114	-61	-82	85	-168	-404	26	-45
Crop Sales/Sources of Cash (Percent)	6.3	26.4	12.5	13.5	1.8	2.0	6.7	.3	2.2	2.5	0	1.9	5.3	5.9
Animal Revenues/Sources of Cash (Percent)	11.1	1.6	5.6	18.6	1.7	15.1	46.5	76.1	3.4	26.6	5.5	47.5	19.0	33.6
Food Purchases/Uses of Cash (Percent)	0	0	2.8	3.6	0.4	0.1	7.8	9	1.5	0.1	0.2	4.2	0	1.7

Source: 1978-79 Farm Survey

[a] Net Cropping Cash Surplus is net cropping cash revenues less foodstuffs expenditures.

Table M.4

Monthly Cash Flow and Performance Measures for Households With Grain Purchases Only

Cash Flow Items	May 1-May 28 1978	May 29-June 25 1978	June 26-July 23 1978	July 24-Aug 20 1978	Aug 21-Sept 17 1978	Sept 18-Oct 15 1978	Oct 16-Nov 12 1978	Nov 13-Dec 10 1978	Dec 11-Jan 7 1979	Jan 8-Feb 4 1979	Feb 5-March 4 1979	March 5-Apr 1 1979	Apr 2-Apr 30 1979	Year 1978-79
Sources of Cash (Revenues From)	5,280	10,646	12,939	6,304	13,722	15,490	7,256	11,561	15,950	4,534	5,706	9,542	14,692	133,622
Crop Sales	674	382	375	374	211	212	232	286	1,018	169	414	799	748	5,894
Farm Services	0	20	54	25	0	30	0	81	127	22	20	38	44	461
Agricultural Trading	551	1,193	791	313	452	776	297	800	15	904	485	2,039	869	9,485
Agricultural Processing and Gathering	147	476	172	207	356	407	261	364	448	273	637	112	388	4,258
Livestock Raising	1,421	5,802	8,507	1,029	9,816	8,460	1,367	7,224	12,012	950	724	593	9,254	67,159
Credit (Borrowing and Reimbursements)	310	524	1,002	719	435	3,873	2,495	583	551	177	458	416	595	12,198
Other Sources	2,177	2,249	2,038	3,637	2,332	1,732	2,604	2,223	1,779	2,039	2,968	5,545	2,794	34,167
Uses of Cash	10,289	6,734	8,955	7,269	10,135	5,304	10,510	11,216	7,041	7,467	9,711	4,030	9,318	107,977
Cropping (Inputs and Services)	859	511	613	460	118	161	145	110	41	58	25	60	173	3,334
Agricultural Trading	663	315	87	293	323	568	1,086	2,132	1,032	827	808	0	1,117	9,251
Agricultural Processing and Gathering	255	368	464	143	549	493	212	236	165	374	422	562	144	4,387
Livestock Raising	3,281	2,808	3,561	3,677	6,652	2,143	4,997	4,380	3,483	2,734	4,492	1,082	1,778	45,068
Credit (Loans and Repayments)	1,104	837	1,495	821	253	471	1,412	2,160	1,062	2,130	1,007	692	2,775	16,219
Equipment (ANTRAC)	48	79	115	101	455	61	0	0	48	0	0	33	304	1,244
Foodstuffs	3,419	1,488	2,198	970	1,159	1,165	736	1,976	1,101	1,111	1,262	1,374	1,880	19,839
Other Uses	660	328	422	804	626	242	1,922	222	109	232	1,695	228	1,145	8,635
Net Cash Flow	-5,010	3,914	3,982	-967	3,583	10,188	-3,255	346	8,909	-2,932	-4,005	5,511	5,373	25,645
Net Cropping Cash Surplus (NCCS)[a]	-5,132	-3,371	-2,777	-1,207	-1,152	-1,109	-757	-1,922	1,597	-1,078	-926	-114	-1,457	-19,415
Crop Sales/Sources of Cash (Percent)	12.8	-3.6	2.9	5.9	1.5	1.4	3.2	2.5	6.4	3.7	7.2	8.4	5.1	4.4
Animal Revenues/Sources of Cash (Percent)	26.9	54.5	65.8	16.3	71.5	54.6	18.8	62.5	75.3	20.9	12.7	6.2	63.0	50.3
Food Purchases/Uses of Cash (Percent)	33.2	22.1	24.5	13.3	11.4	22.0	7.0	17.6	15.6	14.9	13.0	34.1	20.2	18.4

Source: 1978-79 Farm Survey

[a] Net Cropping Cash Surplus is net cropping cash revenues less foodstuffs expenditures.

Table M.5

Monthly Cash Flow and Performance Measures for Households With Grain Sales Only

Cash Flow Items	May 1-May 28 1978	May 29-June 25 1978	June 26-July 23 1978	July 24-Aug 20 1978	Aug 21-Sept 17 1978	Sept 18-Oct 15 1978	Oct 16-Nov 12 1978	Nov 13-Dec 10 1978	Dec 11-Jan 7 1979	Jan 8-Feb 4 1979	Feb 5-March 4 1979	March 5-Apr 1 1979	Apr 2-Apr 30 1979	Year 1978-79
Sources of Cash (Revenues From)	3,835	6,801	10,191	6,596	7,830	7,267	9,527	7,611	7,051	6,402	9,296	6,335	5,847	94,639
Crop Sales	2,166	1,913	692	158	621	1,526	787	508	2,667	1,401	1,071	832	874	15,216
Farm Services	16	0	26	26	145	48	0	0	84	0	26	0	0	371
Agricultural Trading	789	0	5,105	1,421	0	921	395	5,500	368	1,895	4,211	211	0	20,816
Agricultural Processing and Gathering	105	105	211	234	146	471	679	118	334	434	274	955	469	4,535
Livestock Raising	161	4,072	217	2,028	513	1,196	6,242	14	2,645	584	632	539	2,742	21,585
Credit (Borrowing and Reimbursements)	26	210	316	210	416	429	687	184	266	300	1,032	116	111	4,303
Other Sources	572	501	3,624	2,519	6,039	2,676	737	1,287	687	1,788	2,050	3,682	1,651	27,813
Uses of Cash	6,463	2,980	9,606	4,797	6,931	7,553	11,668	10,732	11,219	1,560	3,273	5,338	2,787	84,908
Cropping (Inputs and Services)	738	552	1,014	249	418	182	158	59	218	26	43	131	235	4,023
Agricultural Trading	0	0	0	105	1,634	1,695	7,305	7,790	2,842	39	237	0	0	21,697
Agricultural Processing and Gathering	72	105	79	237	0	231	189	574	258	424	132	28	290	2,619
Livestock Raising	1,155	2,088	1,151	1,373	2,131	2,208	778	349	2,720	374	492	1,487	1,727	18,003
Credit (Loans and Repayments)	2,760	190	1,100	513	467	1,216	407	380	326	697	438	219	284	8,997
Equipment (ANTRAC)	53	5	684	0	0	0	2,355	0	0	0	0	0	0	3,097
Foodstuffs	20	39	124	228	260	479	266	64	72	0	32	147	39	1,770
Other Uses	1,666	0	5,454	2,092	2,000	1,542	211	1,517	4,783	0	1,900	3,327	210	24,702
Net Cash Flow	-2,629	3,822	586	1,800	948	-285	-2,141	-3,119	-4,157	4,841	6,021	996	3,058	9,731
Net Cropping Cash Surplus (NCCS)[a]	1,407	1,304	-424	-293	82	913	363	385	2,461	1,375	1,023	553	599	9,748
Crop Sales/Sources of Cash (Percent)	56.4	28.1	6.8	2.4	7.9	21.0	8.3	6.7	37.8	21.9	11.5	13.1	14.9	16.1
Animal Revenues/Sources of Cash (Percent)	4.2	59.9	2.2	30.7	6.5	16.4	65.5	0.2	37.5	9.1	6.8	8.5	46.9	22.8
Food Purchases/Uses of Cash (Percent)	0.3	1.3	1.3	4.8	3.8	6.3	2.3	.6	.6	0	1.0	2.8	1.4	2.1

Source: 1978-79 Farm Survey

[a] Net Cropping Cash Surplus is net cropping cash revenues less foodstuffs expenditures.

Table M.6

Monthly Cash Flow and Performance Measures for Households With Both Grain Sales and Purchases

Cash Flow Items	May 1-May 28 1978	May 29-June 25 1978	June 26-July 23 1978	July 24-Aug 20 1978	Aug 21-Sept 17 1978	Sept 18-Oct 15 1978	Oct 16-Nov 12 1978	Nov 13-Dec 10 1978	Dec 11-Jan 7 1979	Jan 8-Feb 4 1979	Feb 5-March 4 1979	March 5-Apr 1 1979	Apr 2-Apr 30 1979	Year 1978-79
Sources of Cash (Revenues From)	5,685	4,076	4,972	3,541	5,623	15,166	5,878	7,426	3,915	7,133	4,119	17,975	15,131	100,640
Crop Sales	1,296	293	972	567	1,430	672	1,604	2,407	1,581	2,903	1,179	7,135	1,655	23,694
Farm Services	120	102	55	18	10	10	58	57	23	0	0	65	52	570
Agricultural Trading	2,058	360	85	39	1,094	294	113	0	424	1,200	856	1,040	4,631	12,194
Agricultural Processing and Gathering	216	376	251	162	924	188	310	304	287	130	689	2,623	2,117	8,577
Livestock Raising	1,281	838	2,010	414	200	9,782	2,416	1,493	242	1,511	94	4,451	1,549	26,281
Credit (Borrowing and Reimbursements)	240	853	542	596	314	262	543	426	736	712	715	1,071	3,241	10,251
Other Sources	474	1,254	1,057	1,745	1,651	3,958	834	2,739	622	677	586	1,590	1,886	19,073
Uses of Cash	7,040	4,590	9,712	8,672	4,325	9,291	15,308	12,231	5,619	3,735	4,348	9,506	8,120	102,997
Cropping (Inputs and Services)	1,245	690	483	587	211	315	258	143	220	134	71	65	134	4,556
Agricultural Trading	185	58	119	554	633	713	836	1,330	1,088	1,088	829	5,884	796	14,113
Agricultural Processing and Gathering	106	11	72	137	662	146	185	489	273	346	430	137	98	3,092
Livestock Raising	1,474	606	4,420	839	547	7,126	10,761	6,399	1,072	1,282	739	2,149	2,492	39,906
Credit (Loans and Repayments)	642	587	934	196	777	575	1,099	505	1,259	542	1,535	781	3,542	12,974
Equipment (ANTRAC)	17	345	75	0	130	2	20	0	2	2	10	0	0	603
Foodstuffs	3,303	1,852	3,179	1,070	858	352	614	1,141	1,651	305	671	214	1,058	16,268
Other Uses	68	441	430	5,289	1,007	62	1,535	2,224	54	36	63	276	0	11,485
Net Cash Flow	-1,355	-514	-4,740	-5,131	798	5,875	-9,430	-4,805	-1,704	3,398	-229	8,469	7,011	-2,357
Net Cropping Cash Surplus (NCCS)[a]	-3,632	-2,330	-2,883	-1,141	283	-5	744	872	-403	2,388	226	6,872	410	1,399
Crop Sales/Sources of Cash (Percent)	22.8	7.2	19.5	16.0	25.4	4.4	27.3	32.4	40.4	40.7	28.6	39.7	10.0	23.5
Animal Revenues/Sources of Cash (Percent)	22.5	20.6	40.4	11.7	3.6	64.5	41.1	20.1	6.2	21.2	2.3	24.8	10.2	26.11
Food Purchases/Uses of Cash (Percent)	46.9	40.4	32.7	12.3	17.8	3.8	4.0	9.3	29.4	8.2	15.4	2.2	13.0	15.8

Source: 1978-79 Farm Survey

[a] Net Cropping Cash Surplus is net cropping cash revenues less foodstuffs expenditures.

APPENDIX N

MARKET SHARES

Table N.1

Aggregate[a] Measures of Last Handlers' Market Shares
Of Producers' Millet and Sorghum Purchases

Category of Last Handlers	Transactions		Quantity		Value of Sales	
	#	Percent	Kgs.	Percent	CFA	Percent
Members of the village[b]	327	38.1	35602.3	38.4	1926235	39.5
Village merchants	3	.3	644.6	.7	18400	.4
Outside merchants	39	4.5	3338.8	3.6	246540	5.0
OFNACER	45	5.2	3422.8	3.7	146110	3.0
Food relief	48	5.6	3276.8	3.5	43600	.9
All others[b]	396	46.2	46388.7	50.1	2494605	51.2
Total	858	99.9	93155.6	100.0	4875490	100.0
(Missing cases)	(3)		(11)		(5)	

Source: 1978-79 Farm Survey

[a] It is not warranted to try to account for periods and areas of OFNACER's intervention because no such periods and areas are specified in advance.

[b] Some participants in these two categories may be small foodgrain retailers in market places.

Table N.2

Measures of First Handlers' Market Shares in Villages[a] and During Weeks[b] of OFNACER Intervention

Category of First Handlers[c]	Transactions		Quantity		Value of Sales	
	#	Percent	Kgs.	Percent	CFA	Percent
Members of the village	50	21.0	4348.9	22.0	169735	23.0
Village merchants	-	-	-	-	-	-
Outside merchants	3	1.3	300.9	1.5	8750	1.2
OFNACER[d]	55	23.1	3759.5	19.0	127430	17.3
All others	130	54.6	11334.5	57.4	430635	58.3
Total	238	100.0	19743.8	99.9	736550	100.0

Source: 1978-79 Farm Survey

[a] Producers who sold to OFNACER came from the 9 following villages of the 1978-79 farm sample: Logobou, Bomondi, Dupcaali (in the Diapaga sector), Mantchangou, Mohadagou (in the Kantchari sector), Poniokondi, Ougarou (in the Matiacoali sector) and Tindangou and Kpcaali (in the Pama sector).

[b] Sales to OFNACER that have been misrecorded outside these weeks in periods when OFNACER was not available were dropped because there was no way of allocating these sales in the proper periods.

[c] As already indicated, this typology is incorrect because it ignores agents (possibly some "members of the village" and/or "all others") who purchase grain on behalf of grain merchants.

[d] Aggregate figures of OFNACER shares (in all sectors of the E-ORD) in percent of total transactions, quantities, and values are respectively 11.7, 6.6, and 7.6.

APPENDIX O

APPENDIX O

DISTANCES TRAVELLED TO SELL FARM GRAIN AND BUY GRAIN FOR HOUSEHOLD NEEDS

	Distances From Village[a]				
Percent of	0 km.	1-10 kms.	11-20 kms.	21-40 kms.	> 40 kms.
Farm Grain Sales[b]	38.6	28.8	12.4	14.3	5.9
Household Purchases[c]	37.4	46.7	8.7	1.2	6.0

Source: 1978-79 Farm Survey entire sample.

[a] Distances from the village may be misleading when farmers have sold grain from their granaries in the field (camplments de culture) which may be located quite a few kilometers from the village or compound. But distances travelled to buy food are from the compound where households consume.

[b] Based on a total volume of 67,453.7 kgs (11 missing cases).

[c] Based on a total volume of 92,674.0 kgs (3 missing cases).

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