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**THE DYNAMICS OF GRAIN MARKETING  
IN BURKINA FASO**

**VOLUME III**

**RESEARCH REPORTS 1-4**

**CONSTANCE M. McCORKLE**

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Center for Research on Economic Development  
University of Michigan

and

International Agricultural Programs  
University of Wisconsin

1987

# **THE DYNAMICS OF GRAIN MARKETING IN BURKINA FASO**

## **VOLUME III**

### **RESEARCH REPORTS 1-4**

- PRIDE, PREFERENCE, AND PRACTICE: FARMERS' GRAIN  
DISPOSAL DECISIONS IN A BURKINABE COMMUNITY .... CONSTANCE M. McCORKLE**
- FARM LEVEL GRAIN SECURITY IN BURKINA FASO ..... CHARLES A. MAY**
- MARKET SURPLUS IN BURKINA FASO: A STUDY OF GRAIN  
DISPOSAL PATTERNS ..... ELLEN JEAN SZARLETA**
- CEREAL SALES BEHAVIOR AMONG FARM HOUSEHOLDS  
IN FOUR VILLAGES OF BURKINA FASO ..... CHRISTOPHER R. PARDY**

Burkina Faso Grain Marketing Development Research Project

Prepared by

Center for Research on Economic Development, University of Michigan  
and

International Agricultural Programs, University of Wisconsin  
for

United States Agency for International Development (USAID)

Contract No. AFR-0243-C-00-2063-00

May 1987

## LIST OF ACRONYMS

ACDE	Agence Canadienne pour le Développement de l'Enfance
ADRK	Association pour le Développement de la Région de Kaya
ADS	Agricultural Development Support Project
AVV	Autorité des Aménagements des Vallées des Volta
BCEAO	Banque Centrale des Etats de l'Afrique de l'Ouest
BICIA	Banque Internationale pour le Commerce, l'Industrie et l'Agriculture
BIR	Bureau des Institutions Rurales
CDG	Centre de Gestion
CDR	Comité pour la Défense de la Révolution
CDRY	Comité de Développement de la Région de Yako
CEDRES	Centre d'Etudes et de Documentation pour la Recherche en Economie Sociale
CENATRIN	Centre National pour le Traitement d'Information
CERCI	Centre d'Etudes et de Recherches sur les Cultures Irriguées
CFJA	Centre de Formation de Jeunes Agriculteurs
CIDR	Centre International pour le Développement Rural
CILSS	Comité Permanent Inter-état de Lutte Contre la Sécheresse dans le Sahel
CNCA	Caisse Nationale de Crédit Agricole
COE	Conseil Oecuménique des Eglises
COOP	[Groupement villageois] coopératif
CRED	Center for Research on Economic Development
CRS	Catholic Relief Services (CATHWEL)
CSPPA	Caisse de Stabilisation des Prix des Produits Agricoles
CTFT	Centre Technique Forestier Tropical
DAAF	Direction des Affaires Administratives et Financières
DEP	Direction des Etudes et Projets
DIRC	Direction des Institutions Rurales et du Crédit
DSA	Direction des Services Agricoles
ESSEC	Ecole Supérieure des Sciences Economiques
FAO	Food and Agriculture Organization of the United Nations
FCFA	Francs CFA (50 FCFA = 1 franc français)
FDC	Fonds de Développement Communautaire/Save the Children
FDR	Fonds de Développement Rural
FED	Fonds Européen de Développement
FEER	Fonds de l'Eau et de l'Equipement Rural
FOVODES	Fondation Voltaïque du Développement et de la Solidarité
FSU	Farming Systems Unit
GS	Groupement [villageois] spontané
GVPC	Groupement villageois précoopératif
HER	Direction des Services de l'Hydraulique et de l'Equipement Rural
HIMO/PSTP	Programmes de travaux publics à haute intensité de main-d'oeuvre
IBRD	International Bank for Reconstruction and Development
ICRISAT	International Crop Research Institute for the Semi-arid Tropics
IFPRI	International Food Policy Research Institute
IGHV	Institut Géographique de la Haute Volta

INSD	Institut National de la Statistique et de la Démographie
IR	Institutions Rurales
IRAT	Institut de Recherche Agronomique Tropicale
IRCT	Institut de Recherches du Coton et des Textiles Exotiques
IRHO	Institut de Recherches pour les Huiles et Oléagineux
MCH	Maternal and Child Health
MCODIM	Ministère de Commerce, du Développement Industriel et des Mines
MDR	Ministère de Développement Rural
MET	Ministère de l'Environnement et du Tourisme
OFNACER	Office National des Céréales
OMR	Organisation du Monde Rural
ONAC	Office National du Commerce Extérieur
ONBI	Office National des Barrages et de l'Irrigation
ONERA	Office National d'Exploitation des Ressources Animales
ONG	Organisation non-gouvernementale
ORANA	Organisme de Recherches sur l'Alimentation et la Nutrition Africaine
ORD	Organisme Régional de Développement
OVPB	Organisation des Volontaires des Pays-Bas
PAM	Programme Alimentaire Mondial
PAN	Plan Alimentaire National
PDAHB	Projet de Développement Agricole des Hauts-Bassins
PDAOV	Projet de Développement Agricole de l'Ouest Volta
PDRI	Projet de Développement Rural Intégré
PIS/AFRICARE	Plan Intérieur de Séguénéga
PPIB	Plan de Parrainage International de Boulsa
PPIK	Plan de Parrainage International de Kaya
PVOV	Projet Vivrier de l'Ouest Volta
RR	Reconnaissance Rapide
SAFGRAD	Semi-Arid Food Grain Research and Development Program
SATA	Service de l'Alimentation et de la Technologie Alimentaire
SIX S	Se Servir de la Saison Sèche en Savanne et au Sahel
SOFITEX	Société Voltaïque des Fibres Textiles
SOVOLCOM	Société Voltaïque de Commercialisation, maintenant appelée FASO YAAR
TWIS	Training Women in Sahel
UGVO	Union des Groupements Villageois de l'Oudalan
USAID	United States Agency for International Development
UVOCAM	Union Voltaïque de Coopératives Agricoles Maraîchères

THE DYNAMICS OF GRAIN MARKETING  
IN BURKINA FASO

VOLUME III

RESEARCH REPORT 1

PRIDE, PREFERENCE AND PRACTICE  
FARMERS' GRAIN DISPOSAL DECISIONS  
IN A BURKINABE COMMUNITY

CONSTANCE M. McCORKLE

Burkina Faso Grain Marketing Development Research Project

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## CHAPTER 1

### INTRODUCTION

This document comprises one in a series resulting from the Village Studies component of the USAID/CRED Burkina Faso Grain Marketing Development Project (Contract No. 686-0243). The overarching research mandate of the Village Studies was to investigate farmers' grain marketing decision making strategies within the holistic context of the economic unit's full resource endowments and its characteristic patterns of portfolio management. This report addresses that issue from an anthropological perspective.

Chapter 1 introduces the study site -- the multi-ethnic community of Dankui, in the rich grain-producing zone of the Volta Noire. First, the chapter reviews the community's ethnic composition and political structure, its basic residential and social organization, its inhabitants' occupational pursuits other than agriculture, and its patterns of marketplace attendance. An overview of the village's ecological setting and its agricultural regime is then presented, highlighting the wealth of both wild and domesticated plant and animal resources available to Dankui farmers. The chapter closes with a discussion of the research program, including sample selection, definition of the unit of analysis, major research topics, and methodologies employed.

Chapter 2 -- essentially the core of this report -- turns to an in-depth description of the pervasive importance of staple foodgrain in the economic, nutritional, political, social, and ideological existence of a Burkinabé farming community. In the process, the far-reaching impacts in all these domains of a drought year's poor cereal harvests are also detailed. The chapter initially focuses upon the multitudinous nonmarket types of grain disposals in which farmers engage. In a nation like Burkina Faso -- where farming is primarily subsistence-oriented and where only an estimated 20% of total cereal production ever enters the marketplace or passes through the hands of grain merchants -- this focus is critical. Without a knowledge of nonmarket transactions in, and the priority uses for, grain it is difficult to arrive at any understanding

of when, where, and why farmers may (or may not) choose to market a portion of their cereal harvests. Only within a more global context of grain disposals can the significance of, and the rationales behind, commercial cereal transactions be appreciated. In this regard, one of the more striking findings to emerge from the anthropological research is the existence of a complex sociocultural "code of honor" pertaining to cereal disposals. This code embodies a prudent, profitable, and community-minded program for management of corporate cereal stocks, and it is particularly explicit with regard to grain sales.

Building upon such findings, Chapter 3 launches a systematic investigation of emic/ideal marketing priorities vis-a-vis the principal crop and credit options open to Dankui villagers. It analyzes the results of a controlled ranking task designed in the field by the anthropologist in order to elucidate the preferred place of grain sales in farmers' overall cash-getting strategies. Coupled with respondents' qualitative commentary plus the outcome of earlier intensive interviews, this scaling task reveals broad-based agreement across ethnic, age, and wealth groups on ideal cash-getting behavior. The consensus ranks staple foodgrains as very low priority market commodities for the typical Dankui farming unit -- in contrast to cotton, the cash-getting "king."

The concluding chapter summarizes the major concepts and findings from this study, and suggests some of their broader implications for government policymaking, and future development and research efforts. Finally, a methodology appendix presents selected technical aspects of the research.

## CHAPTER 2

### THE VILLAGE STUDY

#### 2.1 THE VILLAGE OF DANKUI

##### 2.1.1 The Village and Its People

The village of Dankui is located in the Volta Noire region of Burkina Faso. It lies some 25 km to the east of the river of the same name at approximately 12 degrees 6' latitude North and 3 degrees 42' longitude West (see Figure 2.1). Unfortunately, nothing can be said about the boundaries and extent of the village since, according to ORD (Organisation Rurale de Développement) sources, there are no statistics available on total hectareage of holdings for rural communities in Burkina Faso. Politically, however, Dankui forms part of the Department of Ouarkoye, Province of Moun-Hou (formerly, Sub-Prefecture of Ouarkoye and Prefecture of Dédougou). The village can be reached from Dédougou by travelling 46 km south on the direct route to Bobo-Dioulasso, and then bearing 4 km due west at the roadside "town" of Ouarkoye (known in local parlance as Waranko) along a rugged dirt track. Capron (1973:103) notes that Dankui was one of many villages razed in a massive offensive by the French to put down a Bwa revolt in 1915-16. The village's contemporary history presumably dates from its subsequent rebuilding.

Any further description of Dankui is impossible without an appreciation of the community's complex ethnic composition. Based upon the CRED village census of November 1983, among the total population of 851, five different groups are represented. In relative proportions, they are: 33% Bwaba, one of the two major "Bobo" groups<sup>1</sup> of Burkina Faso and the dominant tribe in the eastern Volta Noire region; 30% Mossi, the majority ethnicity of the nation; 30% Fulani, the anthropologically famous pastoralists also known in francophone ethnography as the Peul; 5%

---

<sup>1</sup>In much of the literature and in nontechnical parlance as well, the Bwaba are often referred to as the Bobo Oulé, or "Red Bobo", in distinction to the Bobo Fing. The former speak a Burkinabé language Bwamu, the latter a Mandé tongue. For extended discussions of the history of ethnic nomenclatures in this region of Burkina Faso, see Capron (1973) and Le Moal (1957).

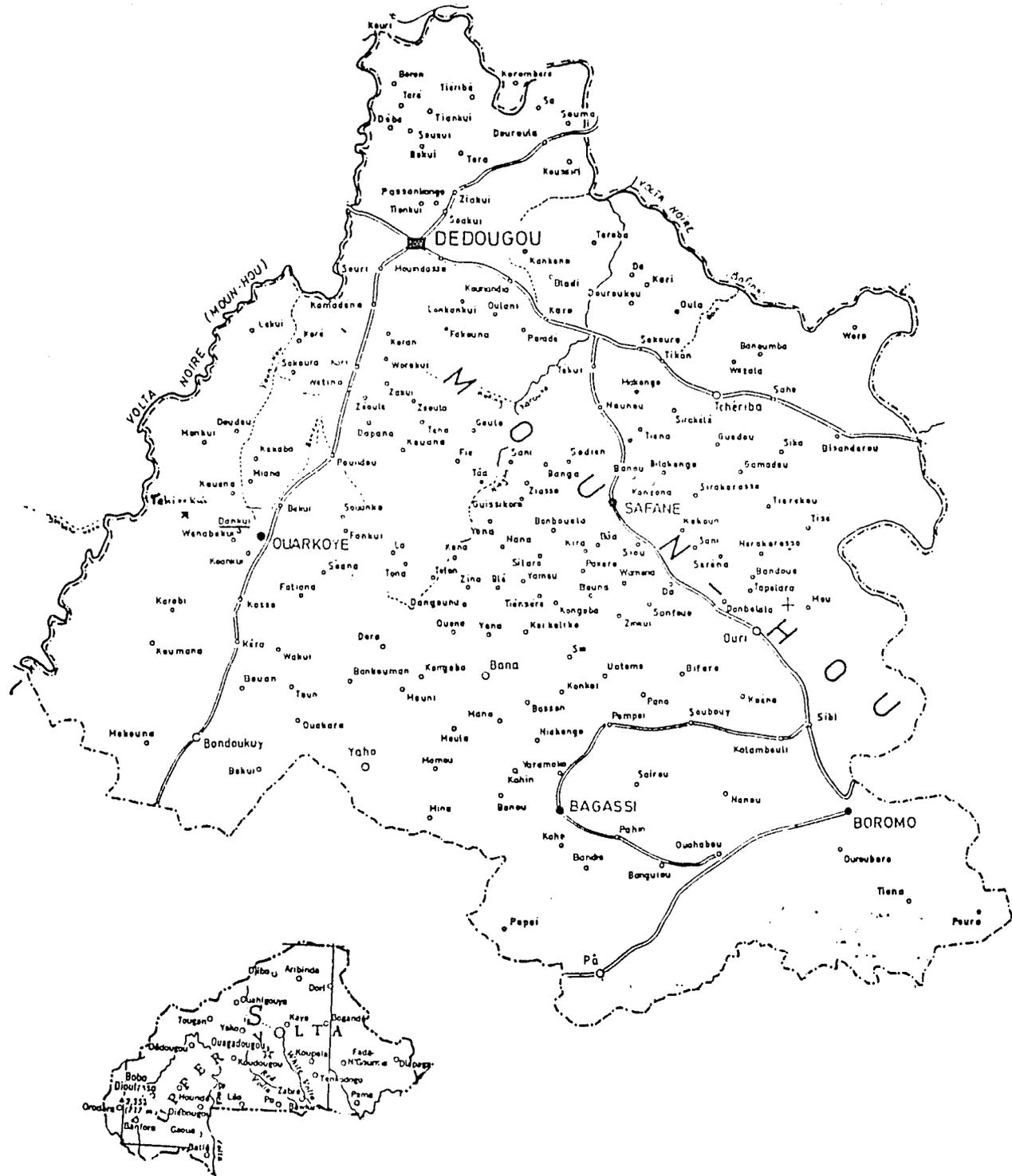


FIGURE 2.1

LOCATION MAP OF DANKUI

University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.

Dafing; and 1% Samo. These percentages should be viewed as only approximate, due both to censusing shortcomings and to wide seasonal fluctuations in population (see below). A more detailed summary of the census findings is presented in Table 2.1.

Each of the five groups has its own language. Census results indicate that a majority of the population also speak the regional lingua franca, Djoula, but only a very distinct minority -- comprised overwhelmingly of young adults and children -- speak any French. All seven languages are mutually unintelligible.

In terms of ideology, all of Dankui's Mossi and Fulani are at least nominally Moslem, as are the majority of Dafing and Samo. Christianity -- in the form of evangelical Protestantism -- has made inroads into four Bwa compounds. With the exception of one anomalously Moslem family, all other Bwaba follow what French ethnologists term "animism," but it is an animism closely melded with ancestor worship.

The Bwaba are, of course, the dominant and indigenous ethnicity of Dankui. Village political structure is highly traditional. Authority is vested in an hereditary chief and his council of elders, all Bwaba. These dignitaries are drawn from the two primary local lineages, Mana and Tamini, plus the griot lineage of Dembele. The current village chief additionally fills the roles of chef de terre "earth priest",<sup>2</sup> and president of Dankui's Groupement Villageois or "Farmers' Group", established in 1976. With the exception of one coequal sublineage of Mana, all compounds annually pay tribute to the village chief -- in grain (Bwaba and Mossi) or in livestock (Fulani).

Besides the Bwaba, and with the exception of one family of Fulani who have always maintained a presence in the area, the other groups represent recent immigrants. According to very precise oral histories, the Mossi began settling in the community only fifteen years ago. Presumably the "pull" factors which attracted them to the Volta Noire region were its richer agricultural lands and relatively lower population densities. This latter factor doubtless made the village chief more open to granting

---

<sup>2</sup>Traditionally, the roles of village chief and earth priest are vested in different individuals from two different Mana sublineages. But the man who would normally fill the latter office in Dankui became a Protestant and is therefore barred from the position.

TABLE 2.1  
THE VILLAGE CENSUS: DANKUI

Ethnic Group	No. of Compounds <sup>a</sup>	No. of Households	No of Individuals	% Total Village Population	Average Household Size	Average Compound Size
Bwaba	30	54	286	33%	5.3	9.5
Mossi	26	34	254	30%	7.5	9.8
Fulani	34	50	257	30%	5.1	7.6
Dafing	5	7	44	5%	6.3	8.8
Samo	2	3	10	1%	3.3	5.0
TOTAL	97	148	851	99% <sup>b</sup>	5.7	8.8

NOTES: (a) Throughout, "compound" is broadly employed to refer to patrilineally (or agnatically) organized kin groups which are: coresidential; economically interdependent in a majority of production, consumption, and distribution functions; and led by one recognized male head. "Household" refers to any married male and his immediate dependents -- whether wives, single children or younger siblings, aged mothers, child wards, etc. Often a compound may consist of only one such married male, in which case the compound and the household become congruent.

(b) Sums to 99 due to rounding.

usufruct rights to "strangers." Dankui's Fulani immigrants began arriving only in the mid-to-late 1970s. The village chief allowed them to camp on his lineage's lands in the district of Koro -- an area currently in fallow.

Today, the three major ethnicities each have their own, separate "neighborhoods." The nucleated settlement of Dankui proper is inhabited by the Bwaba. It is socioculturally -- if not always visibly or geographically -- divided into five wards or quartiers, according to dominant minor lineage and caste differences. The five divisions are: Benowazin, the village chief's ward; Boenowazin, the second most prominent quartier; Koenowazin, headed by the Tamini lineage; Penkonowazin, the domain of a once large sublineage of Mana which has now dwindled to a single member; and Kakowazin, the home of the griots, weavers/musicians. The Mossi quartier lies roughly 5 km westwards of the Bwa settlement. Along with the surrounding lands, it is known as Dar Es Salaam. The Fulani ward, some 4 km north, is simply referred to by the name of the larger district in which it is found, i.e. Koro. Whenever all-village meetings or public works are mounted, ward chiefs and representatives from each of these three groups attend. In contrast, Dafing and Samo have no distinct settlement areas and no recognized spokesmen.

The three tribal wards are readily distinguished architecturally:

the Bwaba by their rectangular houses and ramblingly labyrinthine compounds with "indoor" granaries; the Mossi by their rounded adobe residences with cone-shaped thatching; and the Fulani by the classic dome structures (here, of straw) of nomadic and seminomadic peoples.

Residence patterns vary seasonally within all three groups. Most Bwaba maintain two residences -- one in the nucleated settlement and one en brousse alongside their fields. During the agricultural season (May to January), families live dispersed across the countryside, as far as 19 km from the village proper. At this time, the village itself is primarily inhabited only by the very young, the very old, and members of the community whose agricultural activities are limited, e.g. the weavers/musicians. Small plots of maize, tobacco, and vegetables are tended by those who remain behind in the village. When the harvest is

over and when all cotton sales have been completed (December - January), people once again load up all their belongings and return to their village residences. There they will remain until the rains come -- hopefully in May -- and planting begins anew.

A number of the Dankui Mossi also follow this shifting residential pattern, but instead move between homes in the nearby town of Ouarkoye and their bush residences in Dar Es Salaam. Finally, many of the Fulani take up a seminomadic life after the harvest, ranging through the region in search of water and forage for their own and others' animals. Entire Fulani families may decamp Dankui; alternatively, only the younger men may travel with the herds, leaving their wives and children in the care of the paternal household.

In addition to these seasonal residential shifts, Dankui also experiences the well-known postharvest exodus of young men and adult males, both married and unmarried. They go off in search of work in the major cities of Burkina Faso and in neighboring countries.

Household and compound composition across Dankui's three major ethnic groups is similar, since all are patrilineal and polygynous. (This polygyny is not necessarily localized, however; a number of Mossi and Fulani also keep wives in other villages or regions.) Multifamily compounds are normally constituted along patriline. However, the precise limits of a given compound are often difficult to define. This is because -- as has been noted at all CRED's study sites -- production, consumption, and distribution practices are not always coterminus within and across specified kin or residence units.

For example, a father and his sons (or a set of brothers) may all cultivate separate fields and each control his own storage facilities, but food contribution, preparation, and consumption may be carried out jointly. Further complicating this picture is the fact that Bwa and Mossi wives, too, may cultivate and store separately, with partial to full discretion over disposition of their production. A cooperative arrangement similar to that just described for consumption can also be found in livestock production. Paternal or agnatic groups which are independent in all other economic respects may merge their herds, hire a single Fulani to oversee them, and place all animal management decisions

in the hands of one member of the group (usually the eldest). In the realm of distribution, the head of what is otherwise an autonomous household may rely heavily on another male relative to do the major part of his cereal marketing or purchasing. Also, wives who make and sell dolo (the indigenous sorghum beer)<sup>3</sup> may regularly supply their brewing needs through grain purchases (both direct and credit) from their husbands. In short, the precise types and limits of joint economic endeavor within any given "compound" must be empirically established.

With regard to occupational specializations other than agriculture, the Bwa smiths and griots each form an endogamous caste. The former enjoy an especially high social and ritual status. They manufacture the agricultural tools and basic household implements -- like mortars and pestles for grinding grain -- which no farming family can do without. The smiths also have primary responsibility for sculpting ceremonial masks. In addition, many of the smiths today rank among the "best" and most productive farmers of the community. In contrast, the griots constitute something of an outcaste, "slaves," in Dankui. Their low status is occasioned by the fact that they do little agriculture, instead devoting themselves nearly fulltime to weaving. They therefore must sometimes "beg" for food from other villagers. In addition to weaving, the griots serve as 'town criers," as chiefly "linguists," and as musicians at all village ceremonies.

Besides smiths and griots, only two other traditional occupational specializations -- both part-time -- are found in Dankui. There is one Koranic teacher, a Fulani; and one recognized shaman/curer, a Bwaba. Among the Mossi, half a dozen men devote themselves to regular marketing of items like housewares or dried fish as a major source of income. In the modern sector, but serving in a part-time capacity, are a midwife and a man who administers first aid; both were given basic health training in the nearby town. There is no school, and hence no teacher, in Dankui. Neither are there any housefront stores of even the most modest sort. However, the village boasts a large and solid cereal bank built in 1980

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<sup>3</sup>In Dankui, it is only the Bwaba who make, sell, and consume dolo. In fact, outsiders sometimes characterize and even refer to the three major ethnicities by their beverage preferences: dolo for the Bwaba, zomcom (peppered millet flour water) for the Mossi, and milk for the Fulani.

with ORD funds. Finally, there is an ORD extension agent established in the village to assist with technical questions of cotton and other crops' production.

Beyond the foregoing, nearly all villagers -- both male and female -- engage in various nonagricultural activities on an aperiodic or seasonal basis. For example, many men of all ethnicities do occasional hunting or fishing throughout the year. To earn odd bits of cash during the dry season, Mossi and/or Bwaba may turn their hands to: basic carpentry, brick making, simple masonry, sewing, mat weaving, basketry, beehive construction, collection and sale of firewood, and retailing of commercial beverages.

Principal women's enterprises among the Bwaba include dolo brewing and some very fine potting; both are carried out primarily during the dry season. Fulani females ply their milk trade year-round, although it naturally peaks during the rainy season. And women of all ethnicities may make irregular sales of prepared foods like small fried or honeyed cakes of bean, millet, or sorghum flour; zombala, a favorite relish made from the seeds of the nééré tree; shea butter; various grain-based but nonalcoholic beverages and porridges; and among the Fulani, a sort of cottage cheese. These items may be sold in the marketplace or, more commonly among Dankui women, by going door-to-door in their own and neighboring villages.

With regard to marketplaces, Dankui villagers regularly attend the Friday Tchiookui market (also known as Badala), located 12 km northwestwards of the nucleated settlement (see Figure 2.2). They speak of Tchiookui -- reportedly established in 1977 -- as "our own market in the bush." Referring to Sherman's (1984:103) taxonomy, Tchiookui can be classed as a "medium-sized bush market." It displays characteristics of both "small" and "large" bush markets in her classification, including:

"small"

location between several villages  
 emphasis on household goods like soap, batteries, salt,  
 sugar, cigarettes, fabric, clothing  
 a resident grain trader  
 visits during the harvest season by traders from  
 surrounding areas;

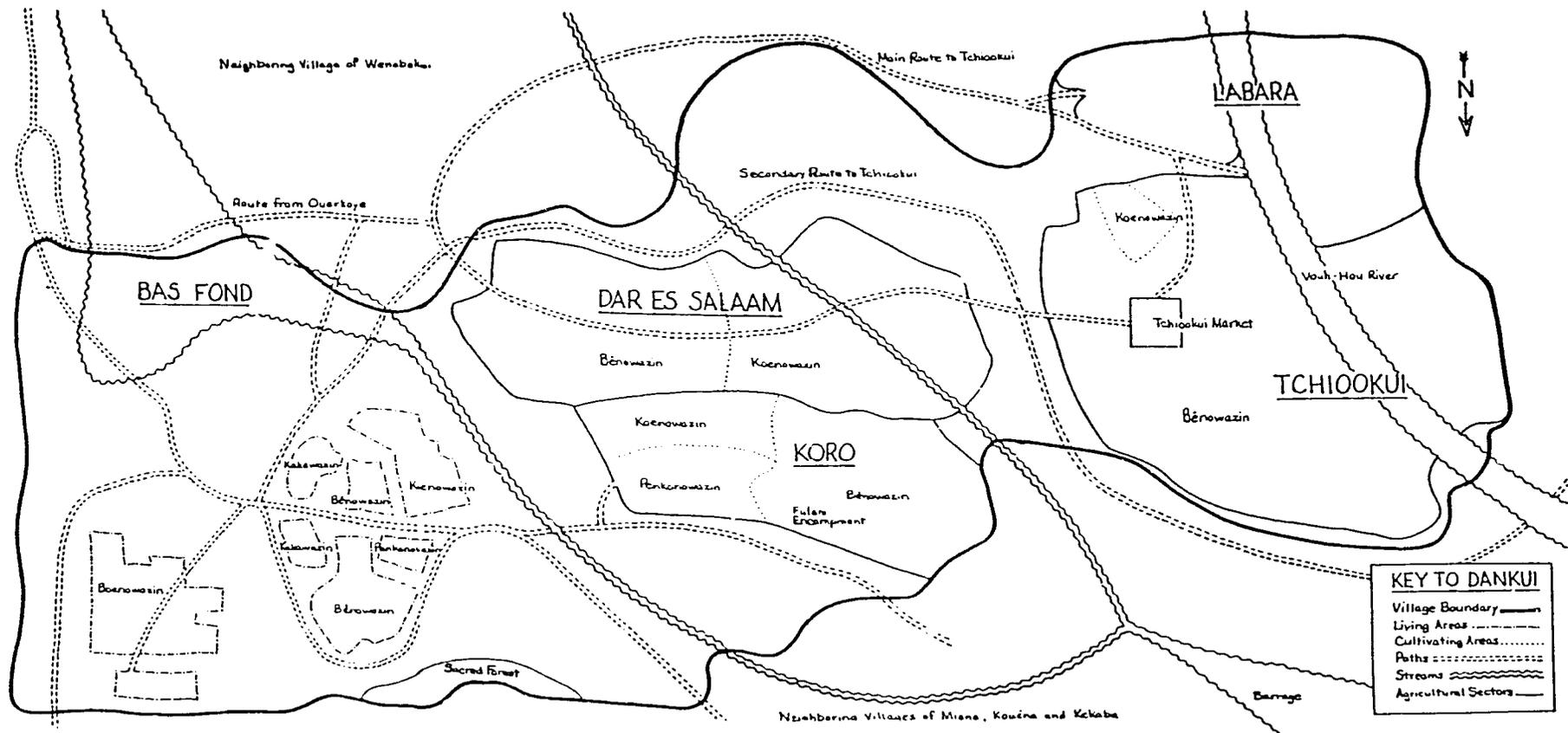


Figure 2.2 Sketch Map of Dankui

University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.

"large"

accessible by truck a wider variety of goods and services  
-- e.g., moped supplies and repair, butchers, tailors, bars.

For special purchases and/or to combine with visits to relatives and friends, villagers may occasionally also travel to the markets of Koumana (the largest and most dynamic market in the region, also held on Friday), Fakena (Sundays), Doudou (Sundays), Moonkui (Mondays), Kouéna (Thursdays), and Kekaba (Fridays). (See Figure 2.1 again.) Finally, the people of Dankui constantly visit the nearby town of Ouarkoye for making small purchases; hiring more skilled or timely services than those available at Tchiookui; drinking and lounging about with friends; processing official papers; attending church services, political meetings, ceremonies, and soccer matches; and so forth.

Table 2.2 -- compiled by Peace Corps member Margaret Stack during a week's research assistance in the Dankui region -- presents an overview of the relative quantity of goods and services available in the Tchiookui, Ouarkoye, and Koumana markets on typical dry-season market days. The figures shown there represent the number of vendors selling the items or services listed. (Where a vendor purveyed more than one good, she/he is classed by the most frequent item in her/his stock.) With its accompanying notes, the Table 2.2 illustrates the diversity in market type and size to be found in the region.

### 2.1.2 Ecology and Agriculture

Dankui lies solidly within the Sudanian ecozone of Burkina Faso, intermediate between the northern Sahelian and southwestern Sudano-Guinean zones. Average annual rainfall in this region ranges from 600 mm to 1000 mm, and soils are highly varied (Peron et al., 1975:17). Furthermore, Dankui itself is blessed with fairly generous groundwater resources. Two streams course through the community's lands, which lie close by a major tributary (the Vouh-Hou) of the Volta Noire River. Taken together, these ecological features give rise to a wealth of natural florae and fauna; they likewise permit a broad mix of plant and animal domesticates.

Turning first to the natural environment, one cannot help but remark the truly astonishing range of wild edibles available within the Dankui

	03/23/84		03/24/84
	KOUMANA	TCHIOOKUI	OUARKOYE
1. Baskets		2	
2. Bottled Beverages	16	3	3
3. Bread	4		2 <sup>a</sup>
4. Brochettes	2	1	0 <sup>b</sup>
5. Butchers	1	1	5
6. Chemical Products	1		
7. Clothing: Traditional	2		
8.       Modern	43	9	1
9.       Mixed	6	6	
10. Cloths (both homespun and manufactured)	11	3	2
11. Condiments	71	47	35 <sup>c</sup>
12. Cooking Utensils and Buckets	3	2	
13. Cotton and Spun Thread	1		
14. Dried Fish	15	4	8
15. Grain Vendors (farmers)	16 <sup>d</sup>		
16. Fowl	3	4	
17. Fruit	12		12
18. Gourds	7	2	4
19. Jewelry	8	4	
20. Kola	11	7	3
21. Koranic Texts	1		
22. Livestock	2 <sup>e</sup>	2	
23. Local Furniture	3		
24. Mats	3		2
25. Mechanics	16	4	3
26. Metal Kitchenware	6	2	
27. Milk	17	5	
28. Mixed Merchandise	15	11	3
29. Motorcycle, Moped and Bicycle Parts	11	1	
30. Moslem Hats	2	1	
31. Pottery	3	3	
32. Prepared Foods	34	13	13
33. Radio Repair	1		
34. Rope and Well Bags	2		
35. Sewing Machine Repair	1		
36. Shoe Repair	5	3	2
37. Shoes	10	1	0 <sup>f</sup>
38. Smithing	9	1	
39. Tailoring	4	1	1
40. Tobacco	6	5	5
41. Traditional Medicine	4	1	
42. Mixed Grain Vendors (all female)	519	209	119
43. Vegetables	19		8
44. Watch Repair	3		
45. Welding	1	1	

TABLE 2.2 (con't.)

- NOTES: (a) In Ouarkoye, bread is sold outside the market at a boutique and at a coffee stand. I included these in the count because Ouarkoye is somewhat unique. It can be considered an absentee market (discussed later) and an extended market, i.e., items are sold on the street in either direction from the market.
- (b) There is one butcher who sells brochettes but his main occupation is selling the butchered meat.
- (c) The condiment sellers in the Ouarkoye market numbered 35, but only one-fifth of them are present on any given day. This is why I refer to Ouarkoye as an "absentee market." The vendors arrive arrange their condiments in salable portion, and then depart. At the end of the day they return to collect the coins deposited on their trays by purchasers. It must be more profitable for them to be elsewhere during the day.
- (d) Within the category of farmer grain vendors there were: eleven selling unhulled rice, three selling field peas, and two with millet.
- (e) There were two places in the market to buy livestock: one for sheep and goats, and another for donkeys.
- (f) In Ouarkoye, shoes are sold in the boutiques.
- (g) Breakdown of women selling mixed grains at the three markets:

	<u>Koumana</u>	<u>Tchiookui</u>	<u>Ouarkoye</u>
hulled rice locally grown	20	3	0
peanuts	16	9	1
millet	7	4	2
field peas	2	3	0
red sorghum	2	0	1
cowpeas	1	1	1
sesame	1	0	0
unhulled rice	1	0	0
imported rice	1	0	6

ecology. Perhaps most familiar among these are the tree products from the karité or shea, nééré, baobab, tamarind, and kapok species. Each of these renders some combination of edible leaves, seeds, flowers, nuts, oil, pith, or fruit which can be variously hulled, dried, ground, roasted, blanched, boiled, strained, pureed, consumed fresh, etc. to create literally scores of different dishes. Many other species which I am not qualified to identify do likewise. To give just a few examples: a tree which gives an egg-shaped fruit called liane in local French; another which sprouts buds used in native couscous; a third which offers a yellow, apple-flavored fruit; and any variety of shrubs and bushes which produce delicious, spinachy-tasting foliage. In addition to the tree foods, Dankui's rich environment reportedly boasts wild plums, grapes, peas, honey, and at least three types of nutritious tubers.

From the animal kingdom, too, comes a plethora of dietary options. To the best of my knowledge and the limits of informants' descriptive powers, these include: several antelope-like species; monkeys; porcupines; agouti; lynx; rabbits and several other rat-like rodents; partridges, wild guinea fowl, hawks, herons, "cow birds," and any number of pigeon-like and swallow-like species which are trapped en masse by an ingenious "fly-paper" technique; pythons and other snakes; at least two types of lizards; carps, eels, and two other fishes for which the French was not known; termites, bee larvae, caterpillars, karité worms, and a huge spider which haunts the peanut fields.

As an aside here, it should be noted that the people of Dankui utilize these wild resources not only for their own home consumption. Many of the items listed above are also commonly marketed. Most notably, these include: the various species of antelopes, fish, and fowl; all the tree products; and nonedible gathered goods like firewood and hardwoods.

The list of plant and animal domesticates is nearly as long. In Dankui, the following cultigens are raised: cotton, white sorghum, red sorghum, pearl millet, white and yellow maize, sesame, rice, two varieties of peanuts, cowpeas, a certain red bean, field peas, fonio, gourds and calabashes, tobacco, melons, mangos, several species of hibiscus, peppers, okra, cucumbers, eggplant, squashes, tomatoes, and onions. An April 1983 ORD/INSD (Institut National Scientifique et

Démographique) study also lists manioc and sweet potatoes. Animal crops include cattle, sheep, goats, donkeys, pigs, chickens, and guinea fowl.

Again, all these items are utilized for both consumption and sale, albeit in differing degrees. Cotton, sesame, tobacco, gourds, calabashes, and the fruits and vegetables are primarily cash crops. (However, in the case of mangos, it strikes me that much of the harvest is gobbled up by village children before it can reach the market!) Villagers also readily market their peanuts, rice, and livestock. Staple food grains, too, are sold. But as we shall see later this is a much more problematic issue.

The very number and variety of cultigens in Dankui makes for a complicated and heavy work schedule during the agricultural season. Of course, not all households raise all crops. Indeed, it is somewhat difficult to generalize across the village population with regard to specific types and relative importance of crops produced. Choice of cultigens and their quantity mix is linked with ethnicity. This reflects not only cultural food preferences and homeland agricultural knowledge and habit, but also relative emphasis on alternate subsistence resources (e.g. livestock) and in Dankui, differential access to varying qualities of land. For example, only Mossi cultivate fonio; and they raise the bulk of gourds and calabashes produced in the community. Tobacco is tended solely by older Bwa women. Sesame, too, is largely the domain of the Bwaba. The Fulani never grow cotton; indeed, they raise nothing more than sorghum, maize, and sometimes a bit of millet and cowpeas. Moreover, the Fulani have been assigned some of the poorer lands of the village.

With the foregoing caveats, however, a few generalizations may be ventured. Sorghum and maize clearly constitute the primary food crops of all three ethnicities. Lesser quantities of millet are grown in Dankui because, according to informants' repeated statements, the local soils are not very favorable to this crop. Cotton, peanuts, and -- in years with normal rainfall -- rice are almost universally cultivated by Bwaba and Mossi. In particular, cotton has come to be the principal cash crop for both these groups. As a primary source of agricultural income, cotton is followed by shea nuts and, for the Bwaba, sesame. The Fulani, of course, rely upon their animal agriculture for cash income.

With regard to livestock, all villagers raise at least some poultry. The vast majority also keep sheep and goats. With the exception of the Fulani, many own one or two donkeys as well. Only the Bwaba raise pigs. Cattle, of course, are the prestige animals par excellence of Africa. While every villager aspires to cattle ownership, however, perhaps only some three-fourths of Dankui compounds currently have any bovine holdings. Again with the exception of the Fulani, in many cases a compound's "herd" of cattle may consist only of the oxen for plowing.

A propos, plows abound in Dankui. According to the CRED village census, 70% of all Bwa compounds possess at least one plow, and five compounds even own two! Among the Bwaba, the ox-drawn plow is by far the most common. The 39% of Mossi compounds possessing plows are almost evenly split between the ox- and the donkey-drawn variety. Only two of the 34 Fulani compounds reported owning a plow. If Fulani are excluded, plow ownership by compound for all other Dankui ethnicities taken together, averages 68%. But people who do not themselves own plows have direct access to this technology through rental arrangements with other villagers.

Description of Dankui's agricultural regime would not be complete without some overview of land tenure and usage patterns. Referring now to Figure 2.2, four distinct tenure/usage sectors can be distinguished. Most salient among these is the bas-fond, a low-lying semiswampy area which is devoted exclusively to rice production. This land is administered by the village chief cum earth priest, who redistributes it aperiodically when plots are left unworked for several years. In theory, every member of Dankui has the right to a parcel in the bas-fond; he need only request it of the chief. In fact, though, only Bwaba and Mossi work this area, since the Fulani have no interest in raising rice. Practically all Bwaba, and a distinct majority of Mossi, do so. Farmers divide their bas-fond parcels into two parts and alternately plant and fallow each half every two to three years.

The sector known as Labara is the exclusive property of Boenowazin, the semiindependent Bwa ward described earlier. This land was reportedly ceded to Boenowazin 27 years ago by the grandfather of the present village chief. The ward chief now administers this property, with the

earth priest's pro forma approval. Unlike the other Bwaba of Dankui, the inhabitants of Boenowazin keep all their bush fields always within this region.

The remainder of the Bwa populace periodically shift their bush fields between the two sectors known as Koro and Dar Es Salaam. The more westernly portion of the latter is further distinguished by the name of Tchiookui. The lands in the two sectors are divided between the Boenowazin and Koenowazin wards, with Penkonowazin still retaining some holdings in Koro. Naturally, the hectarage assigned to the village chief's ward is the largest in each sector. And, in his dual role as chief of Boenowazin and village earth priest, he is directly or indirectly responsible for administration of all these territories.

Currently, Bwa villagers are working the Dar Es Salaam/Tchiookui sector, where they have made their fields for the past 25 years. Prior to this -- from roughly 1917 to 1960, according to oral history -- they worked the Koro sector. The village chief states that, to his knowledge, this back-and-forth shift between sectors has been the norm since the turn of the last century. He notes that the rich soils of Dar Es Salaam/Tchiookui greatly favor sorghum and corn production, whereas the sandier soils of Koro make for better millet and peanut harvests. The chief also volunteered the observation that shifts from one sector to the other have on occasion been triggered by the relative market prices of these crops.

Farmers using animal traction work their holdings intensively, without fallowing but with systematic crop rotation and fertilizer application. In this fashion, a "good" farmer -- defined as one who weeds three to four times per year -- can reportedly work his land for 10 to 15 years. A "bad" farmer who weeds only one time annually may be forced to abandon his fields after only five years. The same is said to be true for those villagers who still till by hand. In either case, abandoned lands are left to fallow for 15 to 20 years, "until the tall trees have returned."

A word now as to the more contemporary agricultural history of Dankui, with special reference to cereals. An April 1983 ORD/INSD study officially ranks Dankui as a grain-surplus (versus deficit or

self-sufficient) village. When queried about their recent harvests, however, villagers universally agree that: during the past two years, overall production has been "bad," with the 1983 harvest being even worse than 1982's; the two preceding years were "good"; and the three before that were "excellent." Indeed, it is only in this latter period that any sample member recalls having had significant carryover stocks of grain. One of the better farmers reports that, two-and-a-half years later, he still had grain in storage from his 1980 harvest. A number of other people claimed one-and-a-half to two-year carryovers from 1979 and 1980.

Younger respondents speak wistfully of this period of plenty, when their work associations earned so much grain in return for agricultural labor that they could throw huge doio and dancing parties. In like manner, many oldsters recall with pride the generous tithes and gifts of grain they were able to make at this time. But these reminiscences stand in marked contrast to the 1983-84 reality. After the following review of research design, the next chapter turns to an in-depth examination of the multiple uses and critical importance of foodgrains in not only the economic and nutritional but also the social and cultural existence of Dankui. In the process, it also highlights the repercussions in all these realms of a poor harvest year.

## 2.2 THE PROGRAM OF RESEARCH

Research for the present study was conducted from August 1983 through August 1984. Intensive anthropological fieldwork extended from October 1983 to the end of May 1984, with follow-up visits to the village thereafter.

### 2.2.1 Subjects

Research subjects were selected by random draw, and an effort was made to stratify the sample by village ethnic ratios, as determined in the CRED census. However, Dankui's Dafing and Samo were excluded from the draw on several grounds. In the opinion of both villagers and the researcher, these groups clearly constituted nonrepresentative elements of the community, together comprising only 6% of the total population. As well as statistically, they also formed clear "outliers"

geographically and historically -- residing at the farthest fringes of Dankui, where they have only quite recently settled. Finally, given a complex three-way ethnic contrast among the larger community, it was deemed that these two groups would unnecessarily complicate the number of independent ethnic-based variables to be controlled, without substantively contributing to a representative corpus of data.<sup>4</sup>

The resulting research population is depicted in Table 2.3. Except when specifically noted otherwise in the text, these 30 compounds provide the data for, and the elements of, the analyses presented in all subsequent sections of this report. The compound was chosen as the basis for analysis since it constitutes the structural level at which all major economic decisions are made -- e.g., whether to buy a plow; sell off some cattle; hold a work party; finance a marriage; bankroll a compound member's entrance into trade or school; and most importantly for the present study, when, where, and how much grain to sell.

Several notes concerning some of the individuals who did -- and did not -- fall into the sample are of interest. First, two compounds of griots were included. While this outcaste represents a significant portion of the indigenous population, as noted earlier they engage in very little agriculture; and they raise no cereals other than maize. It is therefore sometimes expedient to exclude griots -- along with Fulani -- from certain numerical calculations to follow, so as not to blur the majority agricultural or marketing picture. Conversely, by random chance no compounds of the second largest and second most powerful Dankui lineage (which includes one compound possessing the village's only tractor!) turned up in the sample. This could have proved embarrassing, but the situation was mitigated by temporarily hiring a well-known member of the lineage to assist the CRED team in its research.

On the other hand, one of the village's two chefs des jours (an official who divines the most propitious days for ceremonial events) was drawn; according to reliable informants, he is also the second most wealthy Bwaba after the tractor-owning compound just mentioned. The two

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<sup>4</sup>For further details on sampling procedures, and on later additions to the subject population in order to meet certain statistical requirements for economic analysis, see other reports in this series.

TABLE 2.3				
THE VILLAGE SAMPLE: DANKUI				
Ethnic Group	No. of Compounds	No. of Households	No. of Individuals	Average Compound Size
Bwaba	14	19	116	8.3
Mossi	9	11	87	9.7
Fulani	7	11	50	7.1
TOTAL	30	41	253	8.4
University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.				

compounds considered the richest Mossi of Dankui also fell into the sample; the head of one is the Mossi ward chief as well. Although the village chief himself did not form part of the sample, three of his closest political advisors and one of his sons did. One smith fell into the sample, too. Among the Mossi, several men active in commerce were included. Finally, one widow among the Bwaba was drawn -- as was the village drunk!

### 2.2.2 Research Design and Methodology

The very variety of topics to be researched -- e.g., household grain budgets, villagers' real and ideal grain marketing behavior vis-a-vis utilization of other resource endowments, local grain markets and merchants, transport issues, cereal banking and credit, storage, and so much more -- dictated a corresponding variety of field techniques. These are briefly outlined here, and are presented in greater detail in appropriate parts of the text, or in the Appendix.

For sample members, the principal tasks consisted of an intensive tripartite, and progressively more focused, battery of formal questionnaires. These three instruments were successively applied at roughly two-month intervals. The initial protocol was designed to serve a triple purpose: broadly, to verify the quantitative data collected during the first quarter of research in the village (October through December 1983); to elicit producers' descriptions of their grain exchange strategies and quantities, both in the face of a drought year and in more "normal" years; and to acquire the background information and emic insights on grain disposals from which to formulate the methodology for subsequent research on marketing decision making.

The second protocol focused primarily upon "the case for cotton," since it had become increasingly evident that any analysis of cereal marketing in Dankui could not ignore this competing crop. The instrument also sought more detailed information on farmers' grain exchanges and market attendance. The third and final protocol essentially represented a "hole-plugging" effort although again, it addressed some critical issues in the cotton/cereal equation such as fertilizer usage, crop rotation, and timing of sales. Taken together, these three questionnaires embody an average of seven hours of intensive interviewing

per compound, and they provide the bulk of the data upon which this study is based. For the reader's examination, they are displayed in the Appendix.

In addition to these interviews, a controlled ranking task -- dubbed the "Marketing Preferences Scale" (MPS) -- was applied to all Bwa and Mossi compound heads in the sample. The MPS was constructed in the field on the basis of information garnered from the first intensive interview and from other sources. It was designed specifically to fulfill CRED's mandate to investigate farmers' decision making processes with regard to grain marketing. The structure and results of the MPS are discussed in detail later.

Three highly knowledgeable informants (all nonsample members) were asked to perform one further ranking task. Using a modification of Silverman's technique (1966), they generated a global emic index of relative wealth across all the compounds in the research sample. The precise procedures and outcome of this task are presented in the Appendix. The resulting wealth rankings are utilized in comparative analyses throughout the text.

Naturally, bolstering all of the foregoing research methods was the traditional anthropological workhorse, participant observation. In the present case, this included activities as diverse as peering into granaries, pounding and grinding grain, learning to ladle out gourds of grain as the market women do, examining different qualities of produce, visiting traders' compounds to weigh their measuring units, attending market days to observe and sometimes even assist at transactions, drinking dolo, milking cows, etc.

Other more specific aspects of local market research called for additional methodologies. For example, investigation of transport costs and routes sometimes entailed clocking the distances by Jeep or motorcycle, due to inadequate cartographic information on the more remote and recently settled parts of the region. Study of the local markets themselves led to measuring and mapping of their physical extent; enumerating vendors and types of goods sold; open-ended interviewing of market chiefs and of long-time traders on the market's history; and conferring with local CDR (Comité de Défense pour la Révolution) and

Farmers' Group representatives on recent changes in the local cereal trade. Additional studies of the different types and levels of grain merchants operating in the region involved taking "life histories" from a sample of such individuals. Merchants were also consulted on the sensitive issue of Dankui farmers' advance sales of grain; some merchants were even kind enough to allow examination of their personal records of such transactions.

In sum, a highly diverse body of data was gathered using a broad array of techniques. It is not possible to present all these data here, but many are drawn upon, directly or indirectly, as they pertain to topics under discussion. Also, it was hoped that at the time of this writing, at least some of the detailed quantitative findings of the Dankui economics research would be available, to counterpoint those of the more qualitative and often recall-based data of the anthropological effort. Unfortunately, such findings lie a year in the future. In consequence, this report seeks to distinguish, wherever possible, how farmers' description of their "ideal" grain disposal strategies sometimes diverged from what I observed (through other means) to be their "real" behaviors. Ultimately, both sorts of data must be systematically melded in order to understand fully the multiple bases of farmers' grain marketing decision making strategies -- along with the realities that sometimes require farmers to deviate from these strategies.

## CHAPTER 3

### THE MULTIPLE ROLES OF STAPLE FOOD GRAIN IN VILLAGE LIFE

#### 3.1 INTRODUCTION

This chapter presents exemplar compound grain budgets for each of the three major ethnic groups of Dankui. These budgets capture the many types of grain disposals discovered in the course of research. The information presented here primarily derives from the first intensive interview (see Appendix). A main aim of this exercise is to document the multiple roles of food grain in assuring Dankui farm families a secure and satisfying life -- again, not only nutritionally and economically but also socially and culturally. As noted in the Introduction, a second and closely related aim is to illustrate, where possible, the impact of a poor harvest year in all these areas. Third and finally, these simple grain budgets provide a heuristic for introducing and discussing certain ideological beliefs and social constraints relating to cereal disposals. For example, within the context of CRED's research mandate, a particularly important finding is the existence of social sanctions on the unconsidered marketing of family grain staples.

The exemplar budgets are displayed in Table 3.1. Their structure and rationale require some introductory explanation. First, the table refers only to outflows. Second, all units of grain are listed in tines. This measure is employed because it is the one most familiar to Dankui farmers of all ethnicities; i.e., it is the unit they normally use to measure out their grain for sale, and the one they most frequently cite in any discussion of cereal crops. On occasion, Mossi speak of "baskets'-worth" of grain (a harvest time measure) because, unlike the Bwaba, Mossi store their cereal unthreshed. However, they can usually translate baskets into tines without any difficulty. Theoretically, one tine equals one-sixth of a 100 kg sack, or 16.7 kg. In fact, though, the typical Dankui tine is geared to the ORD unit and always includes an obligatory "hat," i.e. a cone of grain heaped up on top of the container. In consequence, it weighs closer to 18 kg when thus filled with sorghum or millet. For conversion purposes, the reader may use this latter figure.

TABLE 3.1  
ANNUAL COMPOUND GRAIN BUDGETS (OUTFLOWS ONLY)  
(sorghum, in tines)<sup>a</sup>

	Bwaba	Mossi	Fulani
Annual "everyday" consumption <sup>b</sup>	104	175 <sup>d</sup>	77
Range	43-180	48-432	48-144
Grain for milk exchange	3	0	0 (6 received)
Grain for <u>dolo</u> exchange <sup>a</sup>	1	0	0
Grain for work parties <sup>a</sup>	5	4	2
Range	0-17	0-5.5	0-3
Payments in kind for agricultural labor	4	3	0
Seed	1	1.5	.5
Feed	4	6	2.5
Grain payments to herders <sup>b</sup>	1.5	0	0 (1.5 received)
Tribute	2	2	0
Gifts and tithes	3	5	4
Ritual reserves	1	0	0
Ceremonial and social consumption	?	?	?
Sales from compound production <sup>c</sup>	12	17	0
Range	0-36	0-60	-

NOTES: (a) Includes both white and red sorghum.

(b) Actual averages from farmers' 1983-84 self report data.

(c) Actual averages from report of sales from 1982 yields; see text.

(d) This figure is atypically high because of a skewedness in the sample such that five of the six compounds in wealth group I (see Tables 2.2. and 2.3.) were Mossi -- including the Mossi ward chief, who has exceptional "everyday" consumption expenditures.

Third, to simplify discussion, the units listed in Table 3.1 are taken to refer to sorghum only. This is by far the principal grain produced, consumed, and marketed/exchanged in Dankui. It is therefore also the one most often involved in the budget entries shown -- with obvious exceptions in such categories as seed. Less obvious exceptions and substitutabilities -- e.g., in ceremonial and social consumption -- are noted in the detailed discussion of each category.

Indeed, the purpose here is not to calculate precisely all inflows and outflows of different grains and other resources within the sample element. Taking a more monolithic and econometric approach, other reports in this series address this formidable task. The exemplar grain budgets instead have a very modest aim: to outline, in a broad but comprehensive fashion, the staple cereal disposals of a typical Dankui farming unit of each major ethnicity. Therefore, unless otherwise noted in the text, the figures displayed in Table 3.1 constitute the average or the most representative responses elicited in the intensive interviews for a normal to good harvest year.

Of course, any definition of "typical" is problematic. In addition to ethnic differences, there is wide variation within even the smallest Burkinabé community in wealth, social status and lineage standing, and in compound size, age and sex composition and hence productive capacity; other characteristics such as occupational specialization and educational level may vary, also. However, the exemplary figures of Table 3.1 may be taken to represent an average-sized Dankui compound of each ethnicity, with no demographic extremes. Using these baseline figures as a departure point, variations resulting from compound wealth or size differences are then systematically examined in each section where they are pertinent -- as are any other variables which significantly impact upon that budget category. Finally, where data are available, discussion of each budget category concludes with a comparison between the normal to good year figures and the disposals reported or projected by farmers for the drought-ridden year of 1983. Note that throughout the report, this year means the 1983-84 ethnographic present, while last year refers to the preceding, 1982-83, agricultural cycle.

## 3.2 THE ROLES AND SIGNIFICANCE OF FOOD GRAIN

### 3.2.1 Daily Consumption

Daily consumption naturally constitutes for all compounds the major grain expenditure category -- not to mention, the overriding aim of cereal production in Dankui. I use the labels everyday or daily to indicate socioculturally unmarked consumption, i.e. the compound's usual, ordinary meals. Also subsumed in this category (simply because they are impossible to factor out) are the many "take-out" servings of cooked food which families of all ethnicities constantly distribute to other compounds in token of kinship, friendship, or communitas. At dinnertime, tribes of women and children bearing steaming bowls of food crisscross the village, tracing out the ties that bind in a face-to-face society. Married daughters may send samples of their cuisine back to their paternal compound; a younger brother's wives do likewise for their husband's elder brother. Lineage heads regularly receive servings from heir component compounds in recognition of their authority, as do a father's aged widow(s) from their respectful sons' compounds. Also, good relations with in-laws and neighbors are maintained in the back and forth of meal exchanges. Neighbor ladies in particular often help each other out with extra food when surprise dinner guests appear. And orphaned oldsters and handicapped people in general receive gifts of hot meals.

The reader should note that, unlike most of the other line items to be discussed, the quantities listed here represent the average, by ethnic group, of sample members' estimates of actual consumption for 1983-84. Respondents were allowed to give their estimates in whatever way was most natural for them -- by days, weeks, or months, in dixièmes (a tenth of a tine), tines, or 100 kg sacks. In fact, the vast majority chose to answer in tines per days or week. These estimates were then translated into the per annum figures of Table 3.1. Although 1983 hardly represents a normal to good year, I felt that information from the ethnographic present would be more useful in this -- the single most important -- budget category. Coupled with censuses and other data, this makes possible more precise observations about relationships between daily

consumption and wealth, or between consumption and current compound composition.

Table 3.1 displays the resulting averages along with the ranges of responses. Before moving to a more detailed level of analysis, it is almost superfluous to state that large compounds' daily consumption is greater than small ones'. This fact is even reflected grosso modo in a simple comparison of the mean membership of sample compounds by ethnicity, displayed in Table 2.2, with Table 3.1's figures: i.e., the Fulani -- who average smaller compounds -- also average lower daily grain consumption; and vice-versa for the Mossi.

Of course, in the case of the Fulani, additional factors are at work. Their overall grain production is much lower than the other groups' since women take little (and ideally, no) part in cultivation, and men's time must be divided between animal husbandry and agriculture. The Fulani themselves further remark that their grain larder is less varied. Once the maize crop is consumed, they usually eat only sorghum for the remainder of the year. In consequence, the 77 tines of sorghum listed here constitute a larger percentage of their annual grain consumption relative to the other two groups. One might suppose, however, that the Fulani diet is bolstered by more meat (even if only salvage) and milk -- although this supposition requires empirical verification from the economic team's consumption inventories.

Table 3.2, provides a substruction of staple grain consumption along the dual axes of compound wealth and size. The ethnic wealth categories shown there are derived from the Silverman rankings, and are the ones used consistently throughout this report. Average compound size for each wealth group is figured three ways: in gross membership, in producer units appropriate to each ethnicity, and in consumer units. (See Appendix for the rationale behind these units.)

The simple, straightforward calculations of Table 3.2 present several, not too surprising findings. Wealthier compounds consume more of the staple grain than poorer ones. This observation holds whether one considers simply gross annual consumption or, more telling, consumption per consumer unit. Also evident in Table 3.2 is a direct relationship among consumption, compound wealth, and productive labor capacity.

TABLE 3.2  
ANNUAL "DAILY" STAPLE GRAIN CONSUMPTION BY COMPOUND WEALTH<sup>a</sup>

Wealth Group <sup>b</sup>	Annual Average Consumption (tines)	Average Gross Membership	Average Producer Units <sup>d</sup>	Average Consumer Units <sup>d</sup>	Annual Average Consumption per Consumer Unit (tines)
I. "riche"	221	12.5	6.7	8.1	27
II. "demi-riche"	105	7.4	4.2	5.0	21
III. "moyen" or "demi-pauvre"	103	8	3.5	5.4	19
IV. "pauvre" <sup>c</sup>	81	7.2	3.2	4.7	17

- NOTES: (a) Recall that this refers only to sorghum; other grains enter the diet seasonally, ritually, or just for variety. Therefore, no caloric estimates of overall cereal consumption can be made on the basis of these or any other data in this report.
- (b) Groups are labelled here with the terms most frequently given (in translation) by judges to describe their rankings. Hereafter, they will be referenced by roman numeral only.
- (c) N = 29 for this Table; data were lacking on one Fulani compound in Group IV.
- (d) See Appendix for derivation of these units.

Ethnicity, too, is linked -- through the size/wealth equation -- to the other entries in Table 3.2. This finding was adumbrated above, but is more dramatically visible from the ethnic composition of each wealth group outlined in Table 3.3.

Table 3.2 requires some further comment. Calculation of average annual consumption of sorghum (in kilograms) per person across the four wealth groups yields the following figures: I 318 kg, II 255 kg, III 232 kg, IV 202 kg. By all current estimates of minimum cereal requirements per person, these sorghum only figures are high. The FAO considers that, to meet minimum caloric requirements of 2,370 kilocalories per person per day, the average Burkinabé must consume 180 kg of cereals per year. USAID takes the total minimum cereal requirement to be 192 kg, while the Burkinabé government claims the minimum is 215 kg (Haggblade 1984:52 ff.). Haggblade himself suggests 205 kg as a national standard of minimum cereal consumption, but feels that this is a conservative estimate. (See also Saul, 1982:218).

Quite a number of factors may be contributing to the discrepancy between these two sets of figures. First, the FAO and other estimates are likely too low because they may overlook the caloric contribution of cereal in the form of dolo (ibid.:54). Second, these official figures represent absolute minima, but many people may enjoy above average cereal consumption, particularly in the Southwestern region -- of which Dankui is a part. In a comparative review of food production and anthropometric data, Haggblade writes:

The overriding conclusion is that the South West has a far greater food availability than other regions. Presumably food consumption is higher there as well, especially given that incomes are highest in the South West, Burkina Faso's cotton growing center... The anthropometric evidence... certainly corroborates what the food production figures suggest - that nutritional status is better in the South West than in other regions (ibid.:12).

Third, if we reexamine Table 3.2's consumption figure for the poorest group (202 kg), we find it is not too far different from most of the minimum estimates -- bearing in mind, of course, that these 202 kg refer only to sorghum, while the estimates consider consumption of all cereals.

TABLE 3.3			
NUMBER OF SAMPLE COMPOUNDS, BY ETHNICITY, IN EACH WEALTH GROUP			
Wealth Group <sup>a</sup>	Mossi	Bwaba	Fulani
I	5	1	0
II	3	4	0
III	0	3	3
IV	1	6	4
TOTAL	9	14	7 30
NOTE: (a) I. is the wealthiest; IV. is the poorest.			
University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.			

Aside from the foregoing considerations, there are several possible sources of methodological and other artifact in the Dankui data. Recall that these figures are drawn from compound heads' self-reports and not from direct observation. In making their reports, informants may have upped their estimates somewhat in order to present themselves in a more favorable light as successful farmers and good corporate managers (Mahir Saul: personal communication), and/or they may have cited ideal rather than real consumption standards. In addition, it is possible that these male informants are sometimes only imperfectly aware of their compound's actual consumption -- at least in those cases where wives are allowed to take grain directly from the granaries on an as-needed basis, in contrast to the more traditional system wherein compound heads distribute the cereal themselves. In either case, there is also the possibility of wives' stealing -- i.e., secretly skimming off a bit of the grain allotted to compound consumption for their own use in petty commerce or other exchange.

However, there is yet another more probable -- and probably more important -- factor in informants' seemingly high consumption estimates. This is the quantity of grain expended in the take-out meals described at the beginning of this chapter, plus those fed to the many friends and extended family members who often drop by at mealtimes. In other words, many more people may in fact be "feeding at the compound trough," beyond the immediate compound membership. Finally, I suspect that a certain amount of ceremonial and social consumption is also hidden within farmers' annual everyday consumption reports. When the data from the biweekly consumption questionnaires of the CREED economic researches become available, they may throw more light upon these issues.

As promised earlier, this section ought to conclude with a comparison between normal to good and poor harvest years. In an unfortunate oversight, however, this question was not posed for this budget category. Yet farmers' perceptions of any shifts in family diet by harvest year would certainly be of interest -- and particularly their strategies for covering shortfalls in the staple food grain. Do people simply "tighten their belts"? Or do they endeavor to purchase supplemental stocks of sorghum, unwilling to diminish their consumption

of this, the most basic, item in the diet? Alternatively, in a truly depressed production year with extreme "real market" (versus official) price rises in sorghum, will farmers instead try to make up the difference with purchases of a more readily available and comparably priced "luxury" grain such as rice? Also, given the rich Dankui ecology, can families perhaps replace part of their cereal shortfall with gathered foodstuffs? Or -- most likely -- do they pursue a mixture of all these strategies?

The economic team's detailed tracking of household food consumption and purchases should shed much light on these questions. Meanwhile, however, some of the findings from the time-depth queries on the intensive interview protocols of the anthropological researches may prove illuminating. For example, farmers clearly suffered shortfall problems this year. Of the 30 sample compounds, only three felt certain their 1983 November-December sorghum and millet harvests would carry them through the hungry season, until the first maize ripens in September 1984. Furthermore, all but one respondent avowed they had no 1982 carry-overs of sorghum or other grain at the time of the 1983 harvest; the one said he had "only a little." Nine (3 Mossi, 6 Fulani) reported that all their this year's grain production was consumed within one to four months of the harvest! By way of contrast, 14 of the 30 respondents' 1982 grain production was sufficient to last up to, and even well beyond (8 of the 14), the first maize of 1983. Across the sample as a whole, on average compounds have 2.6 months'<sup>1</sup> less grain in 1983-84 than they did in 1982-83; then, the shortfall averaged only 0.6 months. In sum, a mean shortfall of over three months is expected in family cereal supplies this year.

How are Dankui farmers responding to this state of affairs? For one thing, quite logically they seem to curtail sorghum sales. An examination of such transactions in the cross-time data for Mossi and

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<sup>1</sup>This figure ranged from +1 month's sorghum supplies (2 compounds) through zero change (6 compounds) to 1-10 month's more shortfall than last year (18 compounds). Four respondents were uncertain; they, along with the two griot compounds, are excluded from this calculation.

non-griot Bwa respondents<sup>2</sup> reveals that, while 62% made at least some sales of last year's crop, by the conclusion of the first intensive interview only 24% had done so this year. Moreover, the average quantity per farmer of those who reported 1982-83 and 1983-84 sales (which include both direct and advance transactions) was 25.3 and 4.6 tines, respectively. Even allowing for possible prevarication on the sensitive issue of advance sales, the difference between these figures is instructive.

Finally, all but one ("Maybe; if there's enough") of this same group of respondents indicated that they envisioned no further sales of compound cereal stocks for the rest of the year. They often volunteered additional comments such as: "If I sell any more, I will only suffer later"; "Even now, my family has no mil"; and from one resigned oldster, "I cannot sell sorghum even to buy myself a few pinches of tobacco. If I told you otherwise, I would be a liar."

In response to a poor harvest year, then, farmers tend to sell less grain. An equally unsurprising finding is that -- again quite logically -- they also buy more. The anthropological researches offer an interesting corpus of data to support this statement. In the time-depth querying, farmers were asked to classify themselves into one of five transaction categories -- following Ouédraogo (1983) and Sherman (1984) -- with regard to their normal annual grain marketing practices. Normal was defined by rough reference to the past ten years, but respondents often volunteered more inclusive comments phrased as "from the time I began farming on my own" or "since moving here (to the Volta Noire region)." Other, more focused questions about the past five years' transactions were also put to each man in order to verify his self-assignment to one category or another. These findings were then compared with his 1983-84 sales reports, including both completed and projected exchanges. The results are displayed in Table 3.4.

The shifts documented in Table 3.4 require little discussion, except to add that three respondents noted, in a vaguely shocked and self-surprised manner, that for the first time in their farming lives

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<sup>2</sup>Fulani say they do not sell any of their food grain ever, and I believe them. I have never seen nor heard of a Dankui Fulani making such a sale, in any year. The same is largely true of the Bwa griots.

TABLE 3.4  
FARMERS' SELF-ASSIGNMENTS TO GRAIN TRANSACTION CATEGORIES

	"Normally"	"This Year"
Only sells	5	1
Both buys and sells, but sells more than buys	2	0
Both buys and sells, but buys more than sells	2	3
Only buys	4	15
No transactions	9	3
Uncertain	1	1
TOTAL	23 <sup>a</sup>	23 <sup>a</sup>
NOTE: (a) The seven Fulani compounds were not queried on this point since they never sell grain.		
University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.		

they were obliged to purchase grain. Another -- the "uncertain" of Table 3.4 -- described how, due to a succession of poor harvests over the past three years, he has been gripped in an ever-tightening spiral of advance sales and emergency repurchases. In sum, although the data presented here cannot speak directly to the question of shifts in daily consumption during a poor harvest year, it is clear that farmers under shortfall pressures will dramatically modify their foodgrain marketing patterns in an effort to protect their family's nutritional well-being.

### 3.2.2 Grain For Milk Exchange

In a normal year, many Bwaba will exchange some of their sorghum for milk, in a volume for volume trade<sup>3</sup> with the Fulani. Rice and millet may occasionally be exchanged in this fashion, too. While such transactions are made by both sexes, they are reportedly more common between women. Bwa mothers often "purchase" milk for their children; in such case, a woman is usually expected to draw upon her own cereal stocks. These are largely acquired through: work on her "private" fields; payments in kind from helping other people to harvest or thresh and winnow their grain; and the obligatory postharvest "gift" of grain which a Bwa husband must make to each of his wives in return for their agricultural labor across the year.

Naturally, there is considerable variation in this budget category across Bwa compounds. For example, those who possess their own milk cows and care for the animals themselves rarely, if ever, engage in such exchanges, just the opposite is true for compounds with no cows and many young children. For families who do trade grain for milk, three times per year may be taken as a representative figure.

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<sup>3</sup>There is no solid evidence from the Dankui research that this exchange rate ever varies with the differential availability, and hence the relative market value, of milk and grain. Both Bwa and Fulani informants deny that it does, and the latter insist they would refuse any exchange in which they are offered less than an equal volume of grain for their milk. Unfortunately, women were not consulted on this question; possibly they might answer differently. But I doubt it. The available evidence instead points to a simple shift from barter to cash when grain values outstrip those of milk.

In contrast to the Bwaba, all but one<sup>4</sup> of the Mossi in the Dankui sample say they never exchange grain for milk. A common rationale given was "milk is just like water." As one man patiently explained to the uncomprehending anthropologist, "you are foolish to trade grain for milk because you will just have to use more grain to put into the milk." In other words, milk and cereal do not have equal ethnonutritional value; so the person who trades his grain for milk is striking a bad bargain. Clearly, milk does not enjoy the same status as a foodstuff among Dankui Mossi and Bwaba. But it is also significant that all but one of the cattle-owning compounds in the Mossi sample care for their own herds. On the rare occasions when the Mossi do turn to the Fulani for milk, they pay for it in cash.

Viewing these exchanges from the other side of the ethnic fence now, several Fulani report that their wives may collect one to two sacks of sorghum per year with their milk trade. Comparing this figure with the ethnic average daily consumption of 77 tines (12.8 sacks) per year, we see that this trade can play a significant role in a Fulani compound's grain budget. Moreover, as one compound head pointed out, such transactions are particularly important in seeing families through the "hungry season," when their own cereal stocks have long been exhausted, and their cash and livestock reserves seriously depleted.

But how does the milk trade fare in a poor harvest year? The answer is predictable. People promptly cut back on consumption of "purchased" milk; and when they do "buy," they pay solely with money. To illustrate, only one of all the Bwaba who reported that they "normally" exchange grain for milk did so this year. As one man emphasized, "it is simply not possible to give out grain this way now"; i.e., it would be very irresponsible. The probable result is that both young children and Fulani experience a drop in nutritional standards. In the former's case, their milk ration is cut. In the latter's, several factors are at work: in a drought year, scarce forage makes for lower milk production, thereby decreasing sales/exchanges and/or own consumption of milk; and faced with stiff market prices, Fulani may be forced to diminish normal cereal consumption as well.

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<sup>4</sup>This man notes that he does so very rarely; and even then, he gives only "bad" sorghum in exchange.

### 3.2.3 Grain for Dolo Exchange

This budget category naturally applies only to Dankui's non-Protestant Bwaba. Even in a normal year it usually represents a minor expenditure; but it is nonetheless an interesting and instructive one. Interesting because, to my knowledge, this form of barter has gone heretofore unremarked in the literature. Instructive because it is very revealing of deep-seated mores regarding stewardship of family food grain.

The exchange rule here is the same as for milk, i.e. a one for one volume of cereal (invariably sorghum) for beer. But, like the Mossi's evaluation of the grain for milk trade, Bwaba consider this a "bad deal" since the same volume of unprocessed cereal can reportedly yield approximately three times as much dolo.

Beyond this fact, though, the practice is very much frowned upon as a grossly selfish and irresponsible squandering of cereal. Worst of all is a compound head who engages in such folly using corporately produced grain, for he is betraying his managerial trust. Or, as one elder puts it, "He is drinking away his family's sustenance." Even so, particularly in the festival atmosphere of the weeks following the harvest -- when it seems there is grain enough to last forever -- some people will indulge themselves. And at any time of the year, a man well into his cups (or in this case, his calabashes) is sometimes disinclined to curb his pleasure for simple lack of coin. He may therefore promise to repay the dolotièrè (breweress) in sorghum and continue his drinking unfettered.

Villagers say that younger heads of compounds are more prone to such behavior, though even elders occasionally err. If a man who "drinks his mil" is known to have had an abundant harvest, gossip about the matter may be subdued. But if he comes up short of grain in the hungry season, his relatives and neighbors will pointedly remind him of his improvidence, and they may even refuse him assistance on these grounds. As we shall see, this community-wide concern about the responsible husbanding of compound cereal stocks is a recurrent theme in many people's comments on grain disposals.

To conclude, it should be noted that there is one instance in which sorghum for beer exchanges are socially acceptable: when unexpected guests who must be well-entertained descend upon a compound without

warning. Much as a harried American in the same situation may rush out to the higher priced but all-night 7-11 store, the Bwa host may turn to a village dolotière who has brewed on that day and, if he is short of cash, he may agree to pay her in sorghum. Some informants stated that, in years with many such visitors, they have expended as much as five times of grain in this fashion.

#### 3.2.4 Grain for Grain Exchange

Belatedly, one further sort of exchange was identified in Dankui: that of grain for grain. Again, this is a one for one volume exchange which ignores the relative market values of the two cereals. Sorghum, millet, and locally grown rice were specifically cited as figuring in these transactions; most likely, maize can, too. These exchanges come about when a family finds it has an excess of one cereal and a shortage of another. They seek out someone in just the opposite situation to effect a mutually beneficial trade. This is reportedly most often done at fete times, when people trade sorghum or millet for unhulled local rice with which to prepare their holiday meals. No quantitative data were obtained for such exchanges.

#### 3.2.5 Grain for Work Parties

Farmers frequently experience family labor shortages or bottlenecks -- whether in tilling, planting, ridging, weeding, or most commonly, harvesting. Shortages may arise due to: unexpectedly high production; illness, death, or travel among family members; or to the farmer's purposely increasing the size of his fields beyond what he knows to be his compound's labor capability. In such instances, people usually hold work parties to fill the labor gap. The "guest list" for such events can be built upon any of a variety of socio-organizational structures: lineage, kindred, neighbors, or "stranger" tenants; the Association des Femmes du Groupement Villageois; a similar group of women from Boenowazin ward, plus another of Dafing women from Ichiookui; the Association des Jeunes Bobo, Bwa boys who band together to earn money for dances and soccer matches; their local Mossi counterpart, the Naam; and the Mossi Songtaba, an organization of men and boys who provide charity labor to the needy.

With certain exceptions (i.e., immediate kin, tenants, the Songtaba, and the Fulani's informal self-assistance groups), the host must pay a daily wage to each worker.<sup>5</sup> Without exception, he must also provide a generous meal to all the laborers; in addition, he usually hands out kola, tobacco, or candy, and among the Bwaba, sometimes dolo. One compound may hold a number of work parties during the agricultural season. For 1983, 18 of the 30 sample members had at least one such event; 13 of the 18 hosted two to five. A total of 43 work parties, averaging 17 members each, were reported. However, many respondents noted that there were much fewer work parties than usual this year -- particularly for harvesting since, as one man ruefully observed, "There wasn't so much to be harvested." It is also noteworthy that of these 43 events, only one was for harvesting grain; the majority were held for picking cotton. This in part explains the Bwaba's higher percentage of work parties, since they grow far more cotton than do Mossi.

In any case, a compound's annual outlay of food grain for work party meals and beverages can be significant, even in a poor harvest year. One sample member, a Bwaba who held three parties, estimates that he utilized a total of 17 tines of sorghum, millet, and corn. While this is an extreme example for 1983, it may give a hint of what quantities can be involved in an excellent year. Then, work parties become especially critical. Pressures on family labor can escalate rapidly as people juggle a complex multicrop harvest schedule. Farmers often find that, at the same time they are hurrying to take in the ripened grain before it is filched by hungry birds or damaged by late rains, they must also rush to finish picking the cotton before the bolls yellow, drop to the earth, or blow away, and before cattle released for stubble grazing on nearby plots can trample the cotton fields.

The figures displayed in Table 3.1 are intended to represent outlays of grain for work parties in a normal to good -- versus an excellent or bad -- harvest year. These are derived as "guessimates" from the median

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<sup>5</sup>In 1983, the rate was 300 FCFA per day for men and 100 to 250 FCFA for women, depending upon the task (100 for seeding, 150 for picking cotton, 250 for weeding). Throughout the research period, the FCFA fluctuated around 400 to U.S. \$1.00.

figures cited by respondents for 1983. Table 3.5 summarizes other information collected about work parties from the intensive interviews. A somewhat unexpected finding from further examination of the data is that the most wealthy compounds in the sample held the fewest parties. Wealth Group I averaged only 0.6 such events in 1983, in contrast to II's 3, and III and IV's 1. Presumably, this datum reflects the larger labor pool within wealthy compounds. There is also a suggestion in some of the interviews that richer farmers may instead hire salaried labor.<sup>6</sup>

To conclude, work parties are a common, and often critical, feature of crop production in Dankui. The outlay of cereals in the form of meals and beverages entailed in these events can be substantial. Indeed, where work parties are held to further cereal production, it could aptly be said that "It takes grain to make grain." This observation is even more apposite to the next budget category -- payments in kind for agricultural labor.

### 3.2.6 Payments in Kind for Agricultural Labor

For Dankui farmers, this represents another way to mitigate labor crunches. For women -- the major participants in this arena -- payments in kind for harvesting, threshing, and winnowing grain play an important role in acquiring cereal stocks of their own. With these private stocks, they can choose to supplement their children's or the compound's meals, market the cereal, or conduct petty commerce in prepared foods and beverages during the slack dry season. Informants say that in a good year, a determined woman can earn up to 12 times of grain from payments in kind, but a more typical figure is two to four times.

With regard to annual expenditures in this budget category, the 1983 data are not very helpful. One compound paid out two times of sorghum in return for assistance in winnowing. But not a single sample member reported any payments for harvesting grain -- for the simple reason that,

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<sup>6</sup>For example, the man ranked as the single most wealthy in the sample paid out 25,000 FCFA (plus meals) to one laborer he hired for the 1982 agricultural season. The employer explained to me that, with one "good" employee, work parties are unnecessary. He seemed to feel that this was a more efficient way to solve labor shortages. In a recent personal communication, economist Gary Christiansen notes that similar observations may emerge from the ICRISAT research.

TABLE 3.5  
1983 WORK PARTIES HELD

	Bwaba	Mossi	Fulani
Percent of sample compounds holding parties	78%	33%	57%
Total number of parties held	28	10	5
Average number of parties per compound	2	1	1.75
Total attendance (39 events) <sup>a</sup>	444 (-1)	162 (-3)	53
Average attendance per party (39 events) <sup>a</sup>	16 (-1)	23 (-3)	11

NOTE: (a) These data are underreported because two men could not recall the attendance at their work parties -- a total of four parties between them. In calculating total and average attendance per event, therefore, these four are excluded.

as one person commented dryly, "Almost no one (needed) any help this year."

Unfortunately, as in the case of daily consumption, no time-depth information on this subject was taken. In consequence, the figure displayed in this budget category for Bwaba is a very rough "guesstimate" indeed; it is extrapolated from reports of grain payments (received) by several sample members' wives in 1983. Fulani women do no such field labor, nor did I ever hear of a Fulani man's hiring himself out in this way; so their zero entry is probably accurate. Mossi also get a low figure here because there were no reports of grain earned in this fashion in 1983. Furthermore, one compound head flatly stated that "The women of Dar Es Salaam do not do this." On the other hand, Mossi do report giving sacks of sorghum to male relatives visiting from the Yatenga who have helped in harvesting and in other agricultural chores. Whether this qualifies as a payment in kind or as a gift is unclear. Finally, too, in normal years, local Mossi grain traders reportedly pay out sorghum in exchange for agricultural labor during the June-July-August "hungry season." One day's labor is said to earn two to three dixièmes (tenths of a tine).

In sum, this subject requires further study -- particularly with regard to its importance in women's economic activities. CRED's formal questioning in Dankui began too late in the 1983 agricultural cycle to capture many payments in kind -- if, indeed, there were many to be recorded. But the detailed tracking of the 1984 cycle should furnish more insight into this grain disposal category.

### 3.2.7 Seed

Bwa and Mossi villagers agree that, to be safe, a compound should retain at least one tine of sorghum for seed. Among the Mossi (who, average larger compounds), many informants suggested it was wiser to keep one and one-half tines on hand. Of course, Fulani use less seed than the other groups because they plant less -- perhaps about half a tine. Smaller quantities of the other grains are required. Nearly all Dankui farmers carefully select and separately store seed from their own production each year. There were only two dissenters on this point in the sample; one Mossi and one griot said they often buy their seed in the market.

Naturally, eating one's seed grain is an act in extremis. The one exception to this rule is for rice, which does not seem to share the same ethnonutritional and social values placed on sorghum, millet, or maize. When rains are poor for several years running, most Dankui farmers leave off rice production; at that point, they often consume their seed. When they resume rice cultivation, they simply purchase replacement seed.

Aside from rice and excepting the two dissenters noted above, all sample members indicated that they "never" eat their seed grain. Never, that is, in normal years. But at the first intensive interview, three Fulani and one Mossi allowed that they had already consumed all their seed grain -- two of them for the first time in their farming lives. Another Mossi and one Bwaba feared that, also for the first time, they might have to do likewise this year.

These statements are hardly surprising when viewed in light of farmers' reports of failed fields in 1983. Only three of the 30 sample members stated they had no such plots. The remainder had at least one barren field of some crop; ten, six, and nine compounds reported failed plots of sorghum, millet, and maize, respectively. Many respondents added that these failures were "not at all normal."

### 3.2.8 Feed

Reports to date from the other CRED sites indicate that this budget category may be fairly unique to Dankui. Even there, people vary widely in the quality, quantity, and frequency of cereal feedings to different animal domesticates. Without going into great detail, however, several generalizations can be made.

First, with only one exception (a griot who feeds maize to his chickens) the grain given to animals is sorghum. Also, the bulk of it is what villagers call bad sorghum, defined as the cereal from which the pericarp cannot be removed through normal processing. However, people may also mix good sorghum -- "the same as we eat" -- in with the bad. This is done almost exclusively for poultry. Indeed, some villagers say they even go so far as to purchase sorghum for their birds! All but two sample members state that they normally give grain to their poultry; however, two Fulani note that they restrict this practice to layers.

Cattle and donkeys are not treated quite as royally as fowl. Only three and four compounds, respectively, indicated they feed grain to

these species with any regularity; for cattle, it is usually the plow oxen who receive such treatment. However, other respondents said they prepare special mashes of sorghum and salt for ailing cattle or donkeys. A few men added that they occasionally reward these species with both good and bad sorghum after a hard day of plowing or drayage. Only three people reported feeding any grain to sheep or goats. Pigs of course receive none.<sup>7</sup>

Generalizations are more difficult with regard to quantities of feed. The budget entries in Table 3.1 constitute the rounded average of responses from the sample for a normal year. But, as the range of responses indicates, quantities naturally vary considerably across compounds, according to their livestock holdings and management practices. Nevertheless, from the intensive interviews it is clear that most compounds expend the majority of their feed grain on poultry.<sup>8</sup> Since this sometimes includes both purchased and food-quality grain, these expenditures may amount to something more than just chicken feed. As we will see later in the discussion of marketing preferences, poultry are important in solving farmers' short-term liquidity problems; they can always be counted on to generate spot cash quickly. Indeed, in the context of family livestock endowments, poultry serve as a sort of everyday checking account -- as opposed to cattle, the savings account (*sine qua non*) of Burkinabé farmers. People endeavor to maintain their checking account in good order through regular feeding of their flocks.

In a poor harvest year, however, this is not always possible. Four sample members say they have suspended feeding of all animals this year. One of these four, a middle-aged Mossi, paints a wryly humorous picture of himself frantically chasing after his birds whenever he wants to catch one to market; he explains that he can no longer spare even a fistful of

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<sup>7</sup>However they, along with most other species, receive the damp pericarp residues left after pounding and rinsing the sorghum.

<sup>8</sup>Most respondents said they feed one fistful of sorghum a day to their flocks. To determine the quantity of grain involved, we counted out and weighed a year's worth of fistfuls, arriving at a minimum figure of 2.4 tines annually. Many people in fact utilize more than this amount though. As a gratuitous bit of information, villagers go to some pains to collect termites for poultry feed too.

sorghum to entice the creatures into easy capture. A fifth man, a Fulani, has rescheduled his poultry feedings from once a day to every two days. Other Fulani complain they are now unable to give any dietary assistance to sickly cattle, and a number of people have generally cut back on quantities of feed to all species. In short, in a poor harvest year, both animal and, indirectly, human well-being suffers.

### 3.2.9 Payments to Herders

Some Dankui farmers -- both Bwaba and Mossi, but more often the former -- contract with local Fulani to oversee a part or all of their herds. Farmers may do so for lack of family labor for herding, or to obtain better care for their animals. The contractual agreement can take various forms. The herder of course has rights to all the milk produced by animals under his care. In addition he is periodically recompensed in livestock, cash, sorghum, or some combination thereof. Within the research sample, the majority of such contracts called for a monthly payment of cash (500 to 2000 FCFA) plus grain (one to two times).<sup>9</sup>

Such arrangements are advantageous to both partners, but perhaps particularly to the Fulani, who can thereby substantially augment their own meagre grain production for what is a relatively small increment in pastoral labor (except during the dry season, when drinking water for the animals must be drawn from wells). Several Fulani indicated that contracts which include partial payment in grain are preferred to cash-only agreements. In a drought year -- when livestock values plummet and sorghum prices skyrocket -- such arrangements offer the pastoralist family at least a modicum of staple foodgrain security, plus a buffer against the vagaries of the marketplace.

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<sup>9</sup>Only one Mossi in the sample employs a herder, and he reports he pays only cash. Hence the zero entry in this category on Table 3.1. I am uncertain whether this represents the norm for such contracts between Dankui Mossi and Fulani, or whether it is simply one example of a variety of arrangements.

### 3.2.10 Tribute

With the exception of griots and the semiindependent Bwa ward of Boenowazin,<sup>10</sup> all inhabitants of Dankui are expected to pay annual tribute to the village chief. For Bwaba and Mossi, this normally<sup>11</sup> consists of two tines of sorghum. Fulani may give one chicken or guinea fowl per compound or, as they did last year, make a collective payment of one head of cattle. Tribute is due the chief out of respect and -- as head of the founding lineage of Dankui and hence the titular "owner" of village lands -- as a reaffirmation of his authority and a semisymbolic thank you for usufruct rights. I say semisymbolic because a compound head who neglects to pay tribute without explanation to the chief technically runs the risk of losing his usufruct rights. (This is truer for "stranger" families than for Bwaba.)

Ultimately, much of this tribute in grain and poultry is redistributed through the fulfillment of chiefly duties -- e.g., in the form of food and beverages at ceremonial events hosted by the chief, sacrifices he must perform on behalf of the community, patronage for the griots, gifts to the needy, and goodwill meals for visitors to the village.<sup>12</sup> Indeed, in these flows of grain and animals into and out of the chief's compound, the threads of the social, political, ideological, and economic fabric of Dankui are traced and reinforced. In a drought year, however, the fabric can begin to fray. For example, a number of compounds were obliged to halve their grain payments to the chief this year; others were unable to pay at all. Pleading destitution, the Fulani refused en masse to render (any) tribute. This gave rise to loudly

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<sup>10</sup>As "slaves" and "beggars", griots are not expected to contribute anything. The inhabitants of Boenowazin pay their grain tributes to the ward chief, who is also head of the leading lineage of Boenowazin.

<sup>11</sup>However, impoverished families, people whose fields have failed utterly, bereaved widows, and so forth are often excused from tribute obligations.

<sup>12</sup>For example: traveling traders; ORD, HER, and other organizational officials; or pesky CRED anthropologists, economists, directors, supervisors, enumerators, etc.

recriminatory meetings, bitter claims and counterclaims,<sup>13</sup> and months of tension between Bwa and Fulani leaders. At the time of writing, the issue was still unresolved.

Sharp reductions in tribute can cause strains in other areas of village life besides the political. Visiting dignitaries may not be properly entertained, thus causing the community to lose face, or funds. The needy may receive less food assistance just when they require it most. And corners may be cut on ceremonies and sacrifices, perhaps angering the ancestors and calling down their wrath upon people, crops, and livestock in the form of illness, blight, drought, or whatever.<sup>14</sup> Although the foregoing may paint too black a picture, the main point should be plain. When grain harvests are dangerously scant, villagers may perceive a drop in their overall quality of life, as well as in more obvious nutritional and economic realms. The next section reiterates this point.

### 3.2.11 Gifts and Tithes

In a normal year the non-griot Bwaba and the Mossi of Dankui make many gifts of grain to many sorts of people. (The grain-poor Fulani do so only rarely.) A favorite category of recipients is of course relatives -- all kinds of relatives. For example, grain gifts to married sisters who come to visit are apparently de rigueur for both ethnicities. At harvest, a compound head often gives cereal to his parents-in-law, certainly to his fathers' widows, and sometimes to other widows of his lineage as well. Some Bwa villagers also send cereal remittances to sons and brothers employed in the nearby city of Dédougou. On rare occasion, Mossi may forward grain to relatives back home in the Yatenga. A number of Mossi informants explained they did so mostly during their first years

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<sup>13</sup>At one point, the chief angrily demanded that, in punishment for their revolt, each Fulani pay him two tines of sorghum. The demand was soon withdrawn as being extremely unreasonable, since some Fulani families' harvests reportedly did not even equal this amount; for others, two tines might represent as much as a quarter of their 1983 yields. And in any case, the Fulani traditionally pay in animals, not in grain.

<sup>14</sup>The reader may smile, but such worries can produce powerful psychological stresses.

in the Volta Noire. But they soon decided that, for the value of the cereal plus its transport, their northern relatives could buy the grain locally for the same, or even a cheaper price. "So now we just send money." Still, when kin come for extended visits to Dankui, they are almost sure to receive some cereal to carry back with them.

Aside from relatives, a second group to whom presents of grain are regularly made is the old, the sick, and the crippled. Indeed, several Bwaba stated that when harvests are good, they have the habit of emptying their granaries of the previous year's stock and distributing it all to "those who can no longer work in the fields." Both Mossi and Bwaba give grain to this group out of a sense of compassion and civic duty. But Bwaba add that they also thereby earn the recipients' blessings and prayers. For the same reason, animist and Protestant Bwaba respectively donate cereal to griots and church elders, while Dankui Mossi give alms of grain to traveling marabouts (Moslem holy men).

At harvest time, goodwill gifts of grain may be made to various other individuals like: field neighbors -- in thanks for loans of agricultural labor and implements, or for general aid across the year; friends with whom one always stays on overnight trips to distant villages or markets, and who often lend advice and assistance in major purchases of grain or other items; herding companions -- i.e., people who regularly merge their livestock and take turns overseeing the joint herd; and pratik partners -- i.e., usually merchants with whom a farmer shares a long-standing relationship and who typically give him special credit consideration. Finally, people often send funeral gifts of grain to help the bereaved defray the stupendous outlays of food and drink which these rites entail.

For Mossi and Fulani, there is one further sort of grain gift - the Zakat. Indeed, for Dankui's Fulani, the Zakat constituted the only regularly reported item in this budget category. These tithes in kind comprise one-tenth of a compound's grain production. They are distributed to Koranic students and teachers, mosque personnel, Moslem holy men, etc. in thanks to Allah for the harvest. A second sort of tithe in kind was described by some Mossi respondents. On the last day of Ramadan, when Moslems cease their fasting and feast instead, a quantity of grain equal to that of the daily compound consumption is donated to the mosque or to beggars, Koranic students, and so forth.

Table 3.6 displays the gifts and tithes of grain reported by sample members from their 1982 and 1983 harvests. For two reasons, these data should be examined primarily for their general trends. First, it was sometimes difficult for respondents to recall with precision all such expenditures across more than a year. Still, responses should be grossly accurate since interviewees were required to name not only the quantities of gift grain but also the recipients; when memories faltered, they were prodded by inquiries about any likely social groups left unmentioned. Second, it is possible that additional gifts from 1983 yields will have been made later on in 1984, after the time of the interview. If so, these should surface in the detailed economic questionnaires, and the table can be adjusted accordingly. However, it is unlikely that discrepancies will be great, since nearly all respondents specifically stated they did not -- indeed, could not -- plan to make any further gifts of grain. One man spoke for many when he remarked, "How can I? Already there is not enough for my own family." And referring to importunate relatives, he grimly added, "This will be a problem."

Despite the foregoing caveats, the trends in Table 3.6 are unmistakable. They offer a clear picture of what happens in this budget category during a drought year. To wit, gifts and tithes are drastically diminished -- particularly among the already hard-pressed Fulani. Indeed, along with four Mossi, five of the seven Fulani compounds in the sample were unable to tithe at all this year; in contrast, only four sample members found themselves in this predicament last year. These nine Moslem compounds plus three Bwa families also could make no other sorts of gifts this year. Across all ethnicities together, gifts and tithes appear to have dropped by roughly half from 1982<sup>15</sup> to 1983.

The effects of these cutbacks are readily predictable, paralleling those noted in the preceding section. The elderly and the handicapped are apt to suffer direct dietary distress -- along, perhaps, with various Moslem devout. Beyond nutritional concerns, however, social relations

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<sup>15</sup>Recall that 1982 also was a poor harvest year. To arrive at a normal estimate of gifts and tithes for display in Table 3.1, I have therefore (admittedly somewhat arbitrarily) added one more tine to each ethnicity's 1982 expenditures. Personally, though, I believe the resulting figures are too conservative.

TABLE 3.6  
GIFTS AND TITHES OF GRAIN<sup>a</sup>  
(in tines)

	From 1982 Harvest		From 1983 Harvest	
	Total	Average	Total	Average
Bwaba (N=10)	28	2.8	15.5	1.5
Mossi (N=8)	35	4.3	18	2.2
Fulani (N=6)	19	3.1	4	.6
Total <sup>b</sup> (N=24)	82	3.4	37.5	1.5

NOTES: (a) These data were also parsed and examined by wealth group, but no clear trends were discernible.

(b) Four respondents who could not offer any recall figures for one or both years are omitted, as are the two griot compounds. Griots are recipients, not donors, of grain.

among human beings and between human beings and their gods are impaired. People cannot live up to normal civic and kin obligations, nor can they materially ratify and reinforce important nonkin networks as fully as they might wish. These sociostructural links may weaken and with them the potentials for mutual economic assistance which they hold. As for the gods, when humankind cannot properly propitiate, praise, and thank them, they are likely to turn vengeful. Moreover, failure to meet basic ideological commitments can lead to debilitating stress and loss of self-concept on the part of the devout.

### 3.2.12 Ritual Reserves

This budget category applies only to Bwaba. Simply put, it embodies the belief that one's granary ought never be completely empty. Though perhaps not immediately obvious, this notion follows the basic tenet of sympathetic magic that "like begets like." A once empty granary may become an always empty granary. In consequence, the Bwaba endeavor to keep at least one tine of sorghum in the bottom of their principal granary. Furthermore, the cereal must be from the compound's own production; it cannot be obtained as a gift or purchase. Ritual reserves can be consumed only when the next harvest is put into storage to replace them. Otherwise, warn informants, the following year's crop will fail. Even if a compound has exhausted all its other supplies of food grain, the ritual reserve must remain untouched.

Bwaba attempt to adhere to this magical maxim even in poor years. Then some farmers store their grain in sacks rather than granaries, explaining that it is not worth the trouble to repair and fumigate the structures simply in order to warehouse tiny yields that will all be consumed shortly. In such cases, one tine of the sacked grain is held in ritual reserve.

Needless to say, the foregoing describes the ideal. Whether, under real stresses, a family might consume its ritual reserve I cannot say. No such incident was ever described to me, and I did not press the point. Certainly though, such an act would be as devastating a declaration of cereal bankruptcy as eating one's seed. More so, in fact, since ritual reserves cannot be replaced from gifts or purchases. Furthermore, while people face only natural, economic risks if they eat

their seed, depletion of their ritual reserves holds the threat of powerful supernatural reprisals.

To conclude, it should be noted that, in a special interview session, Mossi were also queried about ideological correlates of grain disposals. Based on a review of the Yatenga literature, specific questions were put regarding ceremonial sealing and unsealing of granaries across the year, proscriptions on women's handling of cereal stocks, bad (i.e., unlucky or evil) days for taking grain out of storage, sacrifices sanctioning consumption of new harvests, and so forth.

Much to my surprise, these queries triggered huge merriment all around; people literally toppled over on their mats with laughter! When the general mirth finally subsided, the elders gravely complimented me on my "book learning" and then proceeded to instruct me that, while all these animist customs were once followed -- and indeed, still are by some of the old folk in their homeland -- the Mossi of Dar Es Salaam were all good Moslems. As such, they have no truck with these pagan practices. To illustrate their point, they offered observations like: "since we turned to Islam, we no longer care about women's looking into the granaries"; "No one here performs that old, red sorghum harvest ceremony"; and "When we need grain, we just go get it [out of the granary]." (Needless to say, by this time the anthropologist was feeling rather foolish.) The lesson concluded with the summary statement that, "As Moslems, we can do anything we want with our grain."

### 3.2.13 Ceremonial and Social Consumption

This refers to compound consumption which is culturally "marked," i.e., set apart in some way from regular daily meals. This budget category is rather nebulous, involving not only sorghum but also rice and millet. Hence its question mark entries in Table 3.1. It is partially subsumed in several of the earlier line items and perhaps would not merit separate mention except for the fact that informants sometimes insisted on singling it out. I briefly note it here mainly as a possible subject for more in-depth research.

The topic most often arose in response to the intensive interview's query, "This year, how long do you think your grain will last?" People almost always prefaced their answers with the caveats "If I do not have

too many visitors..." and "If there are no deaths in the family..." These eventualities were of much concern to compound heads because, unlike fixed fetes (see below), they cannot always be anticipated and planned for. Yet an excess of unexpected guests or a single funeral can decimate compound cereal stocks to the point of imperiling daily consumption minimum.

For example, unannounced visits from wives' relatives are an especial strain. While many American males may secretly agree with this evaluation in socio-interactive terms, in patrilineal bride-price and bride-service societies like those of the Bwaba and Mossi, wife-givers must be lavishly received in concrete, material terms. This means, among other things, extra large drains on cereal stocks in the form of special meals and beverages, plus gifts of grain. Dankui Mossi further complain of whole households of homeland "visitors" who come to stay for months (often finally settling in the area). They, too, must be fed from ever-diminishing compound stores. In the case of funerals, little need be said. For much of West Africa, these rites can swallow upwards of a compound's yearly income or more. They last for several days, and on each day a hundred or so mourners -- all of whom must be fed and feted -- are usually in attendance. When delicately queried about this eventuality, some Dankui farmers confess they prudently try to put aside additional cereal stocks if there is an aged and/or infirm member of their compound who could soon join the ancestors. To do otherwise is to invite ruin.

Beyond these uncontrollable social and ceremonial expenditures, there are the usual annual fetes. Most prominent among these are Christmas and New Year's, and for Moslems, Tabaski and Ramadan. These events naturally call for feasts involving generous meals -- often prepared with the luxury food grain, rice -- plus huge urns of native beer (Bwaba) or millet flour water (Mossi). Similar feasts are also required for marriages and for Moslem and Protestant baptisms. Finally, lineage heads often have additional ceremonial obligations. For example, among the Bwaba they are responsible for organizing the postharvest sacrifice and feast which initiate consumption of the new grain.

Taken together, ceremonial and social expenditures of grain can add up to a tidy sum across the year. It would be interesting to discover

just what this sum might equal, how it compares in good and bad harvest years, and whether wealthier compounds expend more and/or different types of grain in this budget category than poor ones. As with daily consumption, perhaps the data from two seasons' worth of detailed economic questionnaires will allow more precise, comparative assessments of these disposals.

#### 3.2.14 Sales from Compound Production

As its label indicates, this budget category refers to sales made from the joint cereal production of the compound. Such transactions require approval by the compound head in his role as corporate manager -- versus those made by individual decision from private stocks. Recall that the figures displayed in Table 3.1 represent annual compound sales; i.e., they do not necessarily equal the totality of grain sales made by compound members. This distinction may account in part for the slim quantities listed in the table, but several other factors are at work, too.

For one, Table 3.1 refers only to sorghum; still, compounds rarely market the other food grains (maize, millet, rice) in any quantity.<sup>16</sup> More to the point here is the fact that -- perhaps except bumper cereal harvests -- many Dankui compounds sell more shea nuts, sesame, peanuts, and sometimes even cowpeas and beans (not to mention cotton) than any of the foodgrains. When these other crops are taken into account, cereal sales make a relatively minor contribution to many families' total agricultural income.

Even so, Table 3.1's entries seem unimpressive. Villagers themselves consider annual compound sales of less than 30 tines (five 100 kg sacks) of grain "small." (Ten or more sacks is "a lot.") Conceivably, Table 3.1's low figures could be attributed to the fact that they constitute the sample's mean sales (excluding Fulani and griots) from the 1982

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<sup>16</sup>A notable exception to this observation is Dankui's one tractor-owning family. With this technology, they raise and market maize on a commercial scale. However, they were not selected in the random draw. Within the sample, the largest reported annual compound sale across the past two years of a food grain other than sorghum was six tines of maize.

harvest.<sup>17</sup> Recall that 1982 yields were poor, so presumably 1982 sales village-wide cannot be taken as representative of a normal to good year's transactions. Yet within the CRED sample, only 33% stated that their 1982-83 sales were less than usual; 29% felt they were about the same, and 38% said they were more!

In any case, I suspect that a more likely source of distortion in Table 3.1's sales figures is people's reluctance to mention hungry season advance sales. Briefly, these can be contracted in one of two ways: in return for cash credit, to be repaid at harvest by one tine of grain per 500 FCFA borrowed (this was the standard rate in 1983); or in return for supplies of emergency food grain from merchants -- in this case, each tine taken on credit is repaid with three tines of the same grain at harvest. In either case, no matter what the transaction date or for how long the loan, the nominal interest rate is always 50%, as calculated by the seasonal market values of grain. To illustrate from the 1983 data, a tine of grain purchased from a merchant during the hungry season cost 1500 FCFA; its immediate postharvest price was 750 FCFA. In other words, a 500 FCFA cash loan was repaid with cereal valued at 750 FCFA; and a cereal credit of one tine, worth 1500 FCFA, was reimbursed with grain valued at 2250 FCFA. Finally, I say nominal interest rate because, as more than half the respondents bitterly pointed out, merchants typically use a larger than ordinary tine for measuring all reimbursements in grain.

Although informants were expressly reminded to include advance transactions in their annual sales quotes for both 1982-83 and 1983-84 and to flag them as such, it is unlikely that all did so. Indeed, discreet cross-checks with local traders indicated that a number of sample members glossed over their advance sales. (Interestingly, the majority were younger compound heads; see below.) In the first intensive interview, only four respondents (three Bwaba, one Mossi) confessed to such transactions in 1982. Only two did so for 1983 -- even

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<sup>17</sup>These were the most realistic figures available at the time of the first intensive interview -- both because informants could hardly be expected to recall with any accuracy marketing activities lying much more than a year in the past, and because sales of 1983 yields theoretically could still occur across the remaining months of 1984. In any case, 1983-84 sales certainly could not be accepted as representative of a normal to good year.

though, according to local traders, the volume of advance sales by Dankui farmers was greater than in 1982. All six respondents hastened to defend themselves by citing the past two years' depressed cereal production, unexpected illness in the family, failure to plant cotton one year, or other similar excuses.

Advance sales clearly carry a distinct social stigma. They are correctly viewed as an admission of poor planning on the part of compound management. For this reason, most people are reluctant to discuss them. In an effort to open up conversation on this semitaboo topic, the second intensive interview included a general query: "Do you think that most people in Dankui/Dar Es Salaam make advance grain sales to merchants most years? Or do only a few people or a certain category of people do so?"

Responses to this impersonalized question were somewhat less guarded, although six of the nine Mossi sample members still refused to comment on the subject. However, of the remaining 16 respondents (one Bwaba failed to answer), ten affirmed that in any given year many or a majority of Dankui farmers make advance sales, either to local grain merchants or to the village Farmers' Group. One Mossi added the opinion that "this is the reason for our current cereal crisis." And a Bwaba mused aloud that advance sales would be very difficult in the 1984 hungry season because so many farmers defaulted on their 1983 agreements. "Now, the traders will not give much credit."

In answer to the second part of the query, more than half the respondents felt that younger compound heads in particular make advance sales. Informants explained that the young are always wanting money in order to buy gas to gadabout on their motorcycles and mopeds, to go out drinking or to faire le weekend, and in some unfortunate cases, to cater to frivolous wives' demands for finery.

To summarize briefly, although advance sales often go unreported, they appear to be a common category of grain disposals in Dankui. They are said to be most frequent among younger compound heads, who are more susceptible to the lure of modern consumer goods and lifeways. But in a poor harvest year, when cereal stocks are exhausted early on, many families turn to advance sales as a way of bridging the hungry season gap. Then, such transactions may well constitute quite a sizeable portion of annual compound grain sales. However, because of the social

stigma understandably attached to these contracts, precise data on the quantities involved are not easily obtained. Future research needs to focus more upon this type of sale and upon appropriate methodologies for its study.

Turning now to direct sales, these prove in many ways an even more complex subject. The researcher must evaluate reports of real versus ideal behaviors and examine social sanctions on, versus social approbation of, sales at different times of the year or in varying compound production contexts. Before proceeding to any quantitative analysis, a qualitative overview of what can best be termed "sales sentiments" is helpful. Two key concepts were repeatedly referenced by informants in discussion of grain sales. Roughly translated, these are expressed antonymically as "shame" and "honor". Marketing grain from compound production can constitute either a disgraceful act, to be conducted on the sly and then dissembled from relatives and neighbors; or it can be an honorable act, even a civic service, which wins status and prestige.

When and why is it which? The various answers to this question are highly conditional. Like advance sales, large sales of grain at harvest time are generally frowned upon. The feeling is that, ceteris paribus, this is tantamount to unlicensed gambling with corporate property. Prices are poor at this time. Moreover, as one elder sagely admonishes, "It is impossible to know the future." Another observes, "People who sell grain at harvest time have forgotten how they suffered during the hungry season." Through unconsidered sales of grain, a man reveals himself an irresponsible steward of his corporate trust. As such, he becomes a threat not only to his own compound's economic existence, but also to that of his kith and kin insofar as he looks to their sometimes also slim cereal stocks to cover his losses.

In consequence, there are strong sentiments community-wide against risky grain sales which may later prove to have been "too much, too soon." A man making such a sale therefore tries to hide the fact. He may slip away at night and travel to a distant market to arrange the transaction, so that no one outside the immediate compound is likely to learn of it. Should the seller come up short of cereal later on in the year, he may then hope to escape the social and economic sanctions on his

folly. These take the form of institutionalized gossip and outright refusals of food or cash assistance from his social network. As one informant explained, "The whole village will talk about me if I sell my cereal. And later, if I need to buy or borrow grain, they will refuse to help me, saying 'You just go and buy back your grain from the person you foolishly sold it to in the first place!'" If a man persists in his mismanagement, ultimately his wives and children will abandon him; he will be left to his solitary fate or, at best, reabsorbed as a dependent member of a related compound.

However, there are several conditions under which harvest time sales are acceptable. One, of course, is the case of bumper crops which, even after all possible family grain needs for the year are taken into account, let alone a clear surplus. This can be marketed to merchants and others without "shame". Even so, large sales at this time leave the lingering suspicion that the seller is vain and that, in one man's words, "He wants to show off his success as a farmer." However, one can escape any breath of social opprobrium and earn "honor" as well from harvest time sales to the village Farmers' Group. These are favorably viewed as community-minded transactions. "And anyway," informants confide, "we can always buy back the grain if we need to." Another instance in which large harvest time grain sales are socially approved is a sort of subcase of the surplus situation. A few farmers elect not to grow cotton, instead intensifying cereal production. For these men, grain sales move to the fore as a major source of agricultural income.

Finally, smallish harvest time sales may be made as a stopgap measure to meet December and January fete expenses, national taxes, loan repayments, and school fees. It sometimes happens that cash from October and November sales of shea nuts is exhausted, earnings from sesame are poor, and -- most important -- SOFITEX (the semigovernmental cotton company) is delayed in its purchasing program. In these circumstances, sales of foodgrain (which are quickly and easily made) offer a last minute cash-getting option when it becomes clear that the cotton money will not arrive in time to defray holiday and other expenses.

After the first few months following the harvest, grain sales generally become less stigmatized as the year advances. Unanticipated

grain drains stemming from surprise visitors,<sup>18</sup> deaths, or other emergencies have (or have not) been safely weathered; so remaining stocks can be more accurately evaluated vis-a-vis known compound needs. As newly planted fields begin to sprout in June-July, farmers can start to assess their upcoming harvests. And cereal prices progressively rise, peaking around late August. By the May-August hungry season, farmers who decide they have a surplus may begin to sell to those less fortunate.

Within the emic logic of transaction sentiments, hungry-season purchases are seen as "shameful" indications of poor compound management. On the other hand, sales at this time are viewed as "honorable". The latter earn village-wide respect for the seller as a competent corporate planner. He is a man who has met his compound consumption needs for food grain, and presumably also his social and ceremonial cereal obligations. Beyond this, he has succeeded in generating a surplus for sale, whether through own production and/or through fore-ighted cereal purchases; both reflect wise farm and portfolio administration. Finally, he has astutely timed his surplus sales to coincide with maximum profit potential.

A man who is able to sell grain during the hungry season wins still further status and prestige as something of a community benefactor. The reasoning behind this statement is not immediately obvious. It derives from a diffuse but nonetheless pervasive moral obligation for better farmers/managers to offer their hungry season surplus to relatives, friends and neighbors, and to co-villagers generally, rather than to outsiders and merchants. A man with grain to sell first tells his kith and kin; he may then advertise its availability to the village at large. After that, if grain still remains, he may turn to other outlets.

Moreover -- as all but one sample member agreed -- relatives, friends, and neighbors ideally receive special deals on grain. These may take the form of: a flat 100 FCFA per tine discount from the then current market price (three men); a percentage discount (across 13 respondents, this ranged between 7% and 59%, with a mean of 23%); an extra measure of

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<sup>18</sup>Most visiting is done during the slack dry season. By April-May when the agricultural season begins anew, people need to be back home tending to their fields.

grain (two men); or an outright gift. In contrast, strangers making purchases at the farmgate are almost always (barring emergency sales) charged the going market rate, no matter what the season.

In any case, there is 100% agreement among non-Fulani sample members that one is morally obliged to sell or give grain to one's social relations so long as compound consumption is not thereby prejudiced. Interviewees elaborated this point with comments like: "When I have sorghum and they (relatives and friends) have none, I cannot leave them in hunger"; "One must come to the aid of those who are suffering"; and "You never know but what a day will come when you will find yourself in the same situation."

Given such ethical dicta as the foregoing, surplus producers in a sense purvey a community security stock which they release just at the time it is most needed. Their co-villagers appreciate this service, and they reward such men with respect and prestige. In precise conterpoint to irresponsible corporate managers -- who not only imperil their own compound's well-being but also impose a burden upon broader kin and village resources -- good managers who generate surplus food grain prove an asset to the community at large.

To conclude our discussion of sales sentiments, it should be noted that the ultimate community ideal is to make no grain transactions, i.e. to be fully self-sufficient in cereals and also to have healthy hungry season or end of year surpluses to dispense as gifts. Although few men are able to realize this stringent ideal consistently, a number of sample members reported they have done so in past. (Not surprisingly, the overwhelming majority of these men fell into the two wealthier groups.) These paragons naturally earn the highest "honor" of all.

Table 3.7 presents a summary of sample members' statements regarding preferred channels of grain marketing by season and quantity. Several of the socially approved marketing options just discussed are readily apparent in the table -- e.g., the preference for harvest time sales to the Farmers' Group and for hungry season sales to social networks. Equally evident is a strong disinclination to sell to grain traders at any time of the year. Dankui farmers have a deep distrust of traders. In answer to a query about dealings with this group, all but four of 22 respondents stated that merchants take unfair advantage of farmers. This

TABLE 3.7  
PREFERRED CHANNEL OF GRAIN MARKETING  
BY SEASON AND QUANTITY<sup>a</sup>

Prefers to sell to:	At Harvest Time		During Hungry Season	
	Small Quantity <sup>b</sup>	Large Quantity	Small Quantity	Large Quantity
Farmers' Group <sup>c</sup>	7	13	0	2
Relatives, neighbors, friends	4	1	15	6
Market	6	1	3	3
Grain traders	2	0	0	2
OFNACER	1	2	0	2
Other <sup>d</sup>	0	2	2	5
Would not sell at this time	0	1	0	0

NOTES: (a) N=20 for this Table because Fulani and griots are excluded, and one Bwaba failed to respond.

(b) A small quantity was defined as three tines or less; this is the maximum weight of grain that can be transported on a normal bicycle. A large quantity was defined as anything over three tines.

(c) In fact, the Farmers' Group buys only at harvest time and in advance.

(d) Options mentioned in this category included: beer brewers; one-to-one prearrangement between a seller and a nonmerchant client who collects the grain at the farm; and "anyone who walks up to my door".

query also elicited a wealth of qualitative commentary illustrating villagers' highly negative stereotype of traders.

For example, many interviewees told anecdotes of how grain measured out at home by the farmer suddenly diminishes in volume when presented to the trader. (In answer to an earlier question, 82% of respondents said they always take the tine measure of their cereal before selling in the market or to traders.) They cited discrepancies ranging from 10% to 25%. Other men spoke of heated disagreements over advance sales to, and loans from, traders who blatantly endeavored to cheat or exploit farmers. One informant affirmed that grain merchants conspire to lower prices at harvest time. Another complained of excess profits, describing a 1982 incident he witnessed in which a trader purchased a 100 kg sack of sorghum for 3000 FCFA, then resold it within a few hours for 5000 FCFA. Overall, village stereotypes of grain merchants are very aptly summarized in one man's quip that "If a trader can't make a transaction dishonestly, he won't make it at all!"

While farmers might prefer not to deal with grain merchants, not to buy during the hungry season but to sell, not to make advance contracts, or indeed, not to engage in any grain trade at all, ideal strategies do not always correspond with real practices. Tables 3.8 and 3.9 illustrate this gap. In the former we see, e.g., that merchants are a more usual category of trading partners than village stereotypes would lead us to believe. Conversely, few people in fact make regular sales to the Farmers' Group or during the hungry season, despite the "honor" to be earned thereby. In like vein, Table 3.9 suggests that harvest time and advance sales are common. Not surprisingly, when these same data are parsed by wealth group, we find that 80% of the poorest sample members report making the majority of their sales at harvest time and/or in advance, whereas 0% of the wealthiest group do so. A similar pattern emerges for hungry season purchases -- despite their "shame", and despite yet another village maxim which advises that purchases to supplement stocks be made in November-December-January, when prices are low. Again, wealth group parsing reveals that 62% of the two poorer categories find themselves obliged to purchase during the hungry season. In contrast, this figure is only 27% for the two wealthier groups.

TABLE 3.8 <sup>a</sup>  
 FARMERS' REPORTS OF MOST FREQUENT SALES CHANNEL

	Yes	No
Neighbors, friends, "anybody who comes to the door," wives <sup>b</sup>	10	13
Merchants	7	16
Relatives (excluding wives)	5	18
Marketplace	3	20
Farmers' Group	2	21

NOTES: (a) Fulani are not included since they make no sales, so N = 23 for this Table.

(b) Informants drew the distinction between wives versus other relatives because men regularly make sales to spouses who conduct a petty trade in grain-based foods and beverages.

University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.

TABLE 3.9 SELF-REPORTED "NORMAL" TIMING OF MAJORITY OF GRAIN TRANSACTIONS			
	Bwaba	Mossi	Fulani
<u>Normally Sells</u>			
At harvest time and/or in advance	6	1	0
Year-round	1	2	0
During hungry season	0	2	0
Never	<u>7</u>	<u>4</u>	<u>7</u>
Total	14	9	7
<u>Normally Buys</u>			
At harvest time	2	0	0
Year-round	2	0	0
During hungry season <sup>a</sup>	6	4	2
Never	<u>4</u>	<u>5</u>	<u>1</u>
Total	14	9	7
NOTE: (a) Includes direct purchases plus credit purchases to be repaid at harvest time.			
University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.			

One area where real and ideal converge, however, is in the marketplace. As Table 3.8 indicates, Dankui farmers only rarely sell cereal in markets -- although they readily enough purchase grain through this channel when there is no cheaper or more convenient source. While no sociocultural strictures per se<sup>19</sup> are placed upon such sales, there is a generalized common sensical feeling that trips to the marketplace merely in order to sell grain are a waste of time and energy, and a rather less useful sort of disposal.

These attitudes were manifested in many informants' remarks. "I never lack for people to buy grain here (at the compound), so why should I wear myself out by carrying it to a market?" Or "It takes too much time to sell in the market." "The Farmers' Group is faster. Besides they don't use an oversize tine to cheat me; later I can get credit from them; and that way, too, we have a village reserve." "I can easily find buyers right here in the village." And, "Why bother to go to market when I can get the same price for my sorghum at home or from a merchant? In any given moment there is a known market price; and if merchants and others can't find any grain in the marketplace, then they are obliged to go to people's homes. Anyway I don't own a cart to carry the grain." Many informants especially emphasized the nuisance of transporting grain to market in any quantity. They quite reasonably argue that, anyway this is usually an unnecessary hassle since merchants, beer brewers, the Farmers' Group, and private buyers are almost always willing to handle transport from the farmgate.

In addition to these tangible considerations of fatigue, time, price, and transport in marketplace transactions, remember that farmers earn intangible benefits from nonmarket sales -- at least within their social network. These accrue "honor", plus a reciprocal socioeconomic obligation for transaction partners to make similar preferred grain sales in case of future need. The ideal of selling to one's social network makes real good sense in other ways, too. Such sales obviate fears of extreme negative reciprocity, as in dealings with traders. Moreover, nonmarket sales are particularly convenient in the hungry (planting)

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<sup>19</sup>However, one very devout Mossi cryptically commented that he will not sell in markets because he is a marabout (Moslem holy man).

season. Then farm labor is at a premium and, explains one man, "People cannot afford to go far from their fields." At-home sales to "strangers" at market prices during this period represent a clear profit advantage. And where kith and kin are concerned, the total fatigue/transport/timesavings of planting hungry season sales may well offset much of whatever discounts are given. In short, by adhering to marketing ideals, real economic loss is minimized and real social gain is maximized at one and the same time.

### 3.2.15 "Private" Sales

This final category does not appear in Table 3.1's budgets because strictly speaking it is not a compound-level expenditure. Also, the intensive anthropological interviews with compound heads were not specifically geared to capture sales of this sort, so I cannot say how large or significant they might be. I offer the following information in the spirit of stimulating further, more detailed researches, particularly in women's economy.

As noted earlier, private sales of grain and, more commonly, of foods and beverages prepared from grain do not require corporate approval because the cereal is drawn from individual stocks. These stocks are acquired in various ways: as gifts; through cash or credit purchases; on rare occasion, through barter; or most commonly, from agricultural labor -- whether as a share of the yields from the jointly worked compound fields, from own production on individual "afternoon and Friday" fields, and/or from payments in kind.

As in grain for milk exchanges, women seem to be the most active participants in this category, at least among the Bwaba. (Within the sample, no Mossi or Fulani compounds reported female members engaging in any such trade.) Expectably, too, the primary endeavor here is dolo brewing. Indeed, every ordinary<sup>20</sup> Bwa compound in the sample counted at least one woman among their membership who brews beer for sale. Quantities of sorghum reportedly utilized for this purpose in normal

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<sup>20</sup>Ordinary in this context excludes Protestants and griots, of course, plus the one widow head of compound and the village drunk. The latter's wives have long since abandoned him to his fate.

years ranged from three to eight times per brewer. To my knowledge, all brewers germinate the grain themselves; in any case, I heard of no intermediate sales of malt, as are common on the Mossi plateau (cf. Saul, 1981).

Appropos, I should note that among the Bwaba dolo is neither sold nor consumed in public view in marketplaces -- as it is in parts of Mossi land, Lobi land, and elsewhere in the country. Instead, people drink in the courtyard of the brewer or in other homes designated for the day as taverns. However, Dankui Bwaba do parallel Mossi in that, with only very rare exception, women cannot directly utilize corporate grain for commerce in beer or other comestibles. However, they can and do purchase grain from their husbands and in turn sell beer to them: "there is no joint conjugal estate; mothers or wives have separate budgets" (ibid:751).

Aside from dolo, only three compounds in the sample reported female members who regularly sell other grain preparations. These consisted of small cakes of sorghum, millet, or wheat flour. Again, none of these women's commerce is conducted in a marketplace; instead, they sell door to door in Dankui and neighboring villages.

In sum, much more attention needs to be given to subcompound level transactions in grain. I suspect that there are still other "goings-on" in this area, perhaps akin to Mahir Saul's (personal communication) examples of direct exchanges among the Bobo of grain for condiments or for seed peanuts. Also, subordinate males' disposals of private stocks (if any) require investigation.

### 3.3 CONCLUSION

This chapter has endeavored to describe the truly pervasive importance of staple food grain in the existence of one Burkinabé community. The multiple roles played by a single cereal -- in this case, sorghum -- are all the more impressive when we stop to consider that the village in question lies in one of the nation's richer ecozones, where a plethora of other agricultural, sylvan, and riverine products abound. Nearly all studies of Sahelian farming acknowledge the critical place of cereal crops in techno-environmental adaptations within this region of West Africa. But few have looked beyond the more immediate economic and

nutritional uses of grain to discover how, and how deeply, it is also involved in the actuation of social, ceremonial, and cognitive life.

Indeed, in Dankui grain is far more than just one among many items which can be sold or eaten. It is, of course, the staff of life in the diet; but it is also the coin in which much of social, political, and ideological (as well as economic) exchange is conducted; and it is one of the principal measures of a man's worth. When drought strikes, all these domains are impacted. Small wonder, then, that disposals of staple food grain are hedged about with sociocultural prescriptions and proscriptions, codes of "honor", and taboo. Moreover, these beliefs are no mere matter of useless cultural embroidery; they offer sound advice on how men should go about the prudent, civic-minded, and self-rewarding management of their cereal stocks. As we have seen, these maxims are particularly precise for commercial disposals. In the ultimate analysis, grain is not a preferred market commodity in contemporary Dankui.

To the extent that findings from one small community can be generalized to other parts of the country, it is hardly surprising that only some 20% of Burkina Faso's cereal production is handled through markets and/or merchants (Timothy Mooney, Jacqueline Sherman: personal communications). From the perspective of a Dankui villager, grain is much too valuable in meeting a host of nonmarket or only semimarket needs and aims for the average compound to devote much of its stocks to what might be labeled "asocial" sales -- e.g., in marketplaces, and/or to "strangers," anonymous traders, or faceless organizations like OFNACER. Such sales often entail extra time and trouble, offer uncertain profit advantage, and lead to no social reward or mutual economic obligation. The only thing they earn is money.

For purposes of sheer cash-getting, however, Dankui farmers have many other marketing options -- most notably cotton, livestock, shea nuts, and sesame. In this respect, they assuredly differ from producers in other, harsher agroclimatic zones of Burkina Faso where, aside from livestock, cereal is not only the subsistence staple, but also the single most feasible cash crop. The next chapter turns to a systematic investigation of Dankui farmers' marketing priorities and strategies, pinpointing the place of grain sales in relation to other marketing and cash-getting options.

## CHAPTER 4

### FARMERS' MARKETING DECISION MAKING

#### 4.1 THE MARKETING PREFERENCES SCALE

This chapter responds to CRED's mandate to research the bases of farmers' decision making in marketing grain versus other resource endowments in their corporate portfolio. To address this issue directly, a controlled ranking test entitled the Marketing Preferences Scale (MPS) was designed in the field by the anthropologist. This instrument permitted systematic investigation of Dankui farmers' marketing priorities -- i.e., what goods they would, by preference, sell in order to meet household cash needs, and what goods they would sell more rarely or only under special constraints. In addition to a simple ordering of items, the instrument sought the emic ideal rationale -- that is, the "why," under controlled circumstances --- behind each farmer's rankings.

##### 4.1.1 Description and Design

The MPS consisted of 20 items to be rank-ordered in response to the question, "If you need cash and you have the following ways to obtain it, which would you choose first, and why? Second, and why? Third, and why?" Indeed, the instrument might be more broadly termed a cash-getting options scale. This because it incorporates not only goods which can be sold/marketed,<sup>1</sup> but also credit and loan arrangements -- which can likewise provide much-needed cash. These latter options were included because it seemed important to determine whether farmers might sometimes prefer to borrow money and go into debt rather than sell off valuable livestock, critical food stocks, or basic factors of production such as plows and carts. In initial design of the MPS, inclusion of various types

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<sup>1</sup>The label Marketing Preferences is slightly misleading in another respect. For Dankui farmers, many of the items to be scaled only occasionally (e.g., the major food crops) or almost never (e.g., cattle, sheep, goats, vehicles) enter the classic market(place). But they are nonetheless subject to the market (principle). It is merely that most trade in the village takes place at the interhousehold level or on a one to one trader-farmer basis (out)side the marketplace.

of wage labor was also considered. But such items were finally omitted on two grounds. First, compound heads -- who make the majority of marketing decisions -- seldom engage in wage labor.<sup>2</sup> Second, the gamut of possibilities was too diverse and complex to present visually (see below).

The 20 items ultimately employed were selected upon the bases of actual village products and practices as revealed in the intensive anthropological interviews, and upon pretest trials.<sup>3</sup> The scale items are listed in Table 4.1, along with descriptive notes.

Each of the 20 items was depicted in a polaroid color photograph. At first, simple black-and-white line drawings were essayed. But in pretesting with nonsample members, these proved in several cases too graphically abstract or, as in items 18-20, too visually "busy" for viewers to decipher appropriately. A pictographic approach to the scaling was imperative since only one compound head in the sample could read or write with any facility. In any case, the color photos proved a "big hit" with subjects. They clearly enjoyed the ranking task, promptly dubbed it an interesting game, and generally performed it quickly and surely. Doubtless, it constituted a welcome change from the anthropologist's earlier visits, which entailed long hours of tedious questions.

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<sup>2</sup>Dependent sons and younger brothers are instead the most likely to engage in wage labor at any significant level. Even so, as fully integrated members of the compound, their work is largely limited to temporary dry season employment or, during the agricultural season, to age-mate group labor on other villagers' fields.

<sup>3</sup>In pretesting, 24 items were essayed, but four were finally eliminated. Three consisted of basic factors of production -- draught oxen, donkeys, and plows. Understandably, farmers repeatedly balked at the notion of selling such items. To do so, in effect, is to declare agricultural bankruptcy. Carts and bicycles were retained in the final 20 items as sufficient to capture this attitude -- and even then, respondents vociferously protested even the hypothetical act of selling off these crucial factors. The fourth item omitted was homespun, but since it applied only to the two griot compounds in the sample, it proved largely uninteresting. These omissions simplified the ranking task and at the same time rendered it more broadly applicable and verosimile.

TABLE 4.1  
MPS SCALE ITEMS

1. Sorghum (white and/or red)
2. Millet
3. Maize (yellow and/or white)
4. Locally Produced Rice
5. Sesame
6. Peanuts
7. Beans (white and/or red)
8. Shea Nuts
9. Cotton
10. Gourds (louches and/or calebasses)
11. Poultry (chickens and/or guinea fowl)
12. Small Ruminants (sheep and/or goats)
13. Cattle (excluding draught oxen)
14. Pigs
15. Ox or Donkey Cart
16. Bicycle
17. Moped or Motorcycle
18. Loan of Money from a Relative
19. Loan of Money from the Farmers' Group or One of its Members
20. Loan of Money from a Trader

A discussion of the instrument's design would not be complete without mention of the items omitted. Sometimes, this decision making was difficult. The scale conceivably could also have incorporated the whole range of goods over which nonheads of compound may have individual proprietary rights and which, therefore, can be marketed at their discretion. These include products from: (1) private "afternoon and Friday" fields -- e.g., peanuts, field peas, tomatoes, onions, okra, peppers, tobacco, various condiments and herbs; (2) gathering -- e.g., wild tubers, néré, baobab fruit and leaves, firewood, etc; (3) individual hunting and fishing; (4) women's enterprises; and (5) crafting.

While all of the foregoing activities can generate nontrivial increments of income, as noted in earlier the majority of villagers pursue them on a highly seasonal or aperiodic basis. In any case, the limits of respondents' patience and of their ability to rank-order N items had to be considered. Even the 20 basic items ultimately selected sometimes proved a strain on these limits. Consequently, the line was drawn between secondary sources of marketing income, such as those just discussed, and the primary cash and food crops of Dankui, as listed in 1 through 14 of Table 4.1.

#### 4.1.2 Subjects and Administration

In contrast to the intensive interviews -- which were carried out conjointly with every compound head and his subordinate heads of household in the sample -- the MPS was applied to a delimited subpopulation. First, the instrument was restricted to compound heads since, as noted earlier, they typically have primary decision making powers over disposition of the items included in the MPS. Second, all griots and Fulani were excluded, for the simple reason that they literally never market grain. Third, the one female head of compound in the sample was excused on two grounds. She was relatively recently widowed and was therefore unaccustomed to making compound-level marketing decisions; and in any case, her aged eyesight was too poor to make out the photos. These constraints together made for a total of 20 respondents: 11 Bwaba and 9 Mossi.

Administration of the MPS was prefaced by a thorough explanation of its purpose and structure. In particular, subjects were given to

understand that it represented a "what if" task. It is divorced from their own individual situation (e.g., a given subject might not actually possess cattle or a moped) and from temporal realities (e.g., shea nuts are collected and sold in September–November while cotton is marketed in December–January).

Subjects were able to comprehend this level of generality after it was explained, and to perform the task accordingly. However, they were not reticent to comment on the instrument's artificiality and decontextualization. Happily, such observations greatly enriched the MPS, adding many relativistic caveats to otherwise abstract-idealized rankings. For example, a farmer might comment that he would generally prefer to sell item X before Y, except in month Z (or under other sets of special circumstances) when Y is in short supply and therefore fetches a hefty market price. Or, a subject might note that he would in fact space his sales of a given item across several periods of the year to coincide with known annual compound needs for cash or with heightened ceremonial demand for the good. A farmer might also detail why and under what circumstances, he would prefer to sell a given item to a merchant rather than to a relative or to other villagers. In addition, respondents often stipulated factors which might force them to deviate from their preferred marketing strategies.

In sum, the MPS proved a rich heuristic for eliciting both ideal and real marketing priorities among Dankui farmers, and it furnished key insights into the rationales behind people's decisions to market -- or not to market -- grain and other resource endowments. The following sections present an analysis of MPS results which couples the quantitative findings with farmers' qualitative explanations, and at the same time draws upon supporting data from the intensive interviews.

#### 4.2 ANALYSIS OF MPS RESULTS BY TOTAL SAMPLE AND BY ETHNICITY

Table 4.2 displays both the overall rankings of MPS items plus their rankings by ethnic group. A low score indicates a marked preference to obtain cash in the manner indicated; a high score signals farmers' reluctance to do so. For a measure of agreement between any two groups'

TABLE 4.2			
RELATIVE RANKINGS OF MPS ITEMS ACROSS TOTAL SAMPLE AND BY ETHNIC GROUP			
	Total	Bwaba	Mossi
Cotton	1	1	1
Poultry	2	2	3
Gourds	3	3	2
Shea Nuts	4	4	4
Sesame	5	5	5.5
Small Ruminants	6	6	5.5
Peanuts	7	10	7
Pigs	8	9	9
Beans	9	11	8
Loan from Relative	10	7.5	12.5
Loan from Farmers' Group	11	7.5	16
Moped/Motorcycle	12	12	10.5
Rice	13	14	12.5
Maize	14	13	14
Cattle	15	15	10.5
Loan from Trader	16	16	18
Millet	17	18	15
Sorghum	18	17	17
Bicycle	19	19	19
Cart	20	20	20

NOTE:  $R = .88$   
 $\rho > .01$   
 $t = 7.95$   
 $\rho > .001$

Spearman's  $\rho$  (rho) or R:

$$\rho = 1 - \frac{6 \sum d^2}{N(N^2 - 1)}$$

t-test (two-tailed):

$$t = \rho \sqrt{\frac{N - 2}{1 - \rho^2}}$$

$$df = 2$$

University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.

rankings, Spearman's coefficient of rank correlation -- known as  $\rho$  (rho) or an "R" score -- is utilized. Scores and their significance are computed according to the following formulae (Ferguson, 1966:217, 220).

$$\rho = 1 - \frac{6 \sum d^2}{N(N^2 - 1)} \quad \text{two-tailed } t = \rho \sqrt{\frac{N - 2}{1 - \rho^2}}$$

For the MPS's 20 items,  $R > .53$  and  $t > 2.88$  are significant at the .01 level;  $t > 3.92$  is significant at the .001 level.

Analysis proceeds item by item, first discussing the item's aggregate rank and then examining any ethnic-group differences of interest. In the latter regard, however, the reader should bear in mind that, with  $R = .88$  and  $t = 7.95$  in Table 4.2, Bwaba and Mossi are in fact very much in agreement on their rankings overall. Any variation in an item's score between the two groups is not statistically significant. Finally, rank differences were also calculated by a gross age division (0-50 and 50+ years) and by wealth group. However, both R scores and t tests indicated consistently high agreement across the sample no matter what the social or economic variable under analysis. For the reader's examination, the results are displayed in Table 4.3. But in view of their high concordance and -- in the case of wealth groups, the very small sample numbers -- they are not discussed in the text.

#### 4.2.1 Cotton

Cotton is unquestionably cash-getting "king" in Dankui. For most Bwaba and Mossi, it constitutes the principal source of agricultural income. Among all cotton growers in the sample for whom data were available, gross earnings from this crop averaged 130,238 FCFA, even in 1983's drought year. (This figure ranged between 39,000 and 325,000 FCFA.) Across the past 15 years, informants say commercial cotton cultivation in Dankui has grown by leaps and bounds. This parallels a national trend in which the rate of increase in cotton production has outstripped that of cereal (Steve Haggblade: personal communication; for detailed statistics, see Haggblade, 1984). Indeed, in his discussion of declining per capita cereal production in Burkina Faso since 1960, this researcher's opinion is that, "Certainly the rapid rise of cotton production over the past 20 years has been a contributing factor,

TABLE 4.3.  
MPS RESULTS BY AGE AND BY WEALTH GROUP

Age (0 - 50 versus 50+ years)

R = .92  
t = 9.85

Wealth Group<sup>a</sup>

	I	II	III	IV
I				
II	.96/14.22			
III	.73/4.51	.76/50		
IV	.88/7.75	.83/6.45	.75/4.89	

NOTE: (a) R scores are listed first, followed by t test results. Again, for R > .53, p > .01, and for t > 3.92, p > .001.

University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.

diverting agricultural resources from food to nonfood production" (ibid.:19, 22).

This trend has been actively abetted by combined SOFITEX/ORD campaigns which offer farmers an extremely attractive package of credit, technology extension, transport, and guaranteed price and purchase. Villagers point out that, with these thorough-going supports plus its greater drought resistance, cotton is now a much safer cash crop than cereal. They offer a host of additional observations to explain their number one ranking of this item and their preference for cotton sales over sales of cereal or any other goods. A few examples paraphrased from the MPS and from the intensive interviews follow:

Unlike cereal, you can sell all your cotton in just one day. (Quite a number of informants emphasized this advantage to cotton marketing.)

You get a large sum of money all at one time, and with this you can make major purchases (examples cited included livestock, plows, oxen, carts) or solve major problems. But cereal money mostly comes to you in small, irregular sums you can't really do anything with. (Again, this was a very popular comment.)

You are certain to sell all your cotton. The arrangements for its purchase are very precise, and the price is fixed. (Unlike certain grain marketing channels, there is less room for cheating the farmer.)

The money from cotton arrives just when you need it most -- in January. (People particularly mentioned the need to pay taxes and to reimburse loans from the Farmers' Group at this time.)

Relatedly, the price for cotton is high, but in order to get a good price for your grain you must wait until the hungry season.

Dankui's lands are better for cotton than sorghum, and when the rains are poor it does much better than sorghum.

Grain is much more expensive than it used to be -- and you can't eat cotton.

Even a small harvest of cotton fetches a goodly sum of money.

You need the fertilizers left over in the earth plus the humus from fallen cotton leaves for your cereal crops to succeed the following year. (Grain is almost invariably rotated onto the previous year's cotton fields.) That way, too, you have to buy less fertilizer for your cereals. (A substantial majority of respondents mentioned this factor.)

Offsetting these multitudinous advantages, informants could find only two disadvantages to cotton as a cash crop -- both, however, in the realm of production rather than marketing. One hundred percent of the sample remarked that cotton is more work to raise than grains; and 47% of those responding said it does more damage to the land than any other crop. But as one man pointed out, even this latter feature may not be such a shortcoming, "what with all the fertilizer we now use."

Some of the more amusing and/or conclusive MPS quotes summing up the question of cotton versus cereal marketing included the following:

"Cotton is just for selling. You can't do anything else with it. Better to sell it than your food."

"Why sell grain? We may just have to buy it back later at a higher price!"

"Cereal is a thing a man should not sell."

Q.E.D. This final comment particularly highlights the thrust of nearly all respondents' commentary, throughout their performance of the MPS, with regard to marketing cereal as versus other commodities.

#### 4.2.2 Poultry

The case for poultry as a preferred market item has already been introduced in an earlier discussion of feed. As noted there, poultry sales provide a quick and easy way to obtain small amounts of cash year-round. The birds can be readily sold door to door, on the way to or at the market, or to traders specializing in this commodity. Many respondents expressly noted that they turn first to poultry to solve any surprise needs for spot cash. Some added that they would sooner decimate their flocks than sell off other MPS items they deemed critical; grain, cattle, and factors of production were particularly cited in this context.

Beyond spot sales, there is a rough seasonal cycle to poultry marketing, with dual peaks around December-January and again in March-May. In December-January the demand for fowl is high, as people prepare their holiday feasts. Moreover, the birds are especially fat and healthy at this time from gleaning all the fallen grain in harvested fields and in threshing areas. These two factors together make for the best poultry prices of the year.

The second sales peak in March-May results from two conditions. First, the improved nutrition of November-January gleanings raises reproductive and survival rates. The chicks hatched at this time reach marketable weight in a matter of months. By March-May, sales from this New Year's crop make good sense for several reasons: the birds fall sick more easily from diseases which attack during these hot, dry months; feed for them is scarce; towards May and the beginning of the hungry (= planting) season, extra cash comes in handy for funding agricultural work parties and supplemental purchases of food grain; also, for the past several years one of the major Moslem feasts (Ramadan) has taken place during the hungry season months.

Finally, lest the reader be left with the misimpression that earnings from poultry sales are always small, it should be noted that a number of Dankui farmers reap quite a substantial income from their aviculture. One man, a Bwaba, is rumored to earn upwards of 100,000 FCFA annually in this fashion. (Having examined his flocks personally, I have no doubt this is true.) And a Mossi sample member reports that in a good year he takes in 50,000 to 60,000 FCFA from his poultry sales.

#### 4.2.3 Gourds

Although most families in Dankui raise at least a few gourds for their own use, this crop is grown in quantity only for sale. As noted earlier, Dankui Mossi are generally more active in this cash crop than Bwaba; hence their slightly lower MPS ranking. Gourds are usually sold in bulk transactions in January-February, when the shells are well-dried and the traders specializing in this item come round to make up their annual stock. However, one Mossi compound in the sample reports they do their own retailing, thereby increasing their profits.

Informants claim that in years with abundant rain, when gourds produce especially well, they can earn a tidy little sum from this enterprise. But more important, many respondents pointed out that, like poultry, gourds offer another, particularly timely, source of cash which allows them to stave off "shameful" harvest time sales of grain.

#### 4.2.4 Shea Nuts

Ranked as the fourth most preferred sale item, shea nuts, or karité, provide an exceptionally flexible source of income year-round. They can

be sold dried or smoked, early or late, or in advance. Each of these options has its advantages. Advance sales to local merchants (the same men who deal in grain) can be made in August or even earlier, just before collection of the nuts gets underway. These transactions -- which carry no social stigma -- can provide much-needed cash for work party expenses, for end of hungry season purchases of grain, or for other food stuffs to supplement or backstop the September-October maize harvest.

From August through November, the price of this commodity steadily rises. By November, merchants conclude their buying and ship the nuts to Bobo-Dioulasso. Karité purchased by merchants is first sun-dried by the seller, but reportedly, it must be commercially treated against worms within a few months or it will be ruined. In contrast, smoked nuts will keep for a year or more. In any case, farmers who can postpone their sales until November realize much greater profits. To judge from local merchants' reports of their annual volume of trade in this commodity, shea nuts are one of Dankui's major cash-getters.<sup>4</sup>

Competing with merchants for the karité crop are largescale shea butter makers. These women usually attempt to stock up their annual needs at the same time the merchants are buying -- thus contributing to price rises. But unlike the latter group, the women may continue buying across the year if they find their supplies running low. Anticipating this eventuality, some villagers will smoke an extra share of karité, beyond that kept back for their own home consumption, to sell to the butter makers at premium prices later on. (People usually retain the best nuts for smoking.) Village wives who decide to process and sell a bit of shea butter may also purchase in this fashion from their husbands.<sup>5</sup>

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<sup>4</sup>Precise price and quantity information on advance and direct sales of dried and smoked nuts at different times of the year should emerge from the detailed economic questionnaires for the 1984 karité season.

<sup>5</sup>Ownership rights in karité and other trees are confusing. However, men reportedly hold the rights to all trees on land being worked by them -- although I am uncertain how this rule applies to alien immigrants. Women have proprietary rights only to shea nuts which they have collected from trees "in the bush." The whole subject of tree ownership and tree-crop rights requires considerable further research. FSU/SAFGRAD has recently turned its attention to this issue, and their investigations should yield some "fruit" within a few months.

Finally, if a man finds himself hard-pressed for cash, the attractive prices paid for smoked nuts late in the year may induce him to sell off some of the compound's reserves -- and simply tighten the family's "lipid belt," as it were. A majority of MPS respondents cited this possibility and indicated it was a perfectly acceptable marketing strategy. Other comments on karité sales included the following:

The price is higher than that of peanuts.

Another informant added, I would sooner sell shea nuts than peanuts, and keep the peanuts for my children to eat. "Karité can be sold early on, before any of the new crops are ready for harvesting.

And from another man, "Karité is the first thing to be collected.

I would sell all my karité rather than touch my cereal.

#### 4.2.5 Sesame

Little explanation of sesame as a preferred marketing item is necessary. Aside from the relatively small quantities kept back for household consumption, this grain is grown expressly for sale. Its status as a family foodstuff is low; many informants stated that sesame is "just a sauce" while others added comments like "It is not a cereal like the others" or "The other grains are more truly 'grain' than sesame is."

Most sesame is sold in advance and at harvest time to local merchants. However, the village Farmers' Group reportedly sometimes purchases sesame as well. Later in the year, if a smallish quantity of cash is needed, farmers say they will dip into the family stocks without qualm and send their wives to sell the grain by louche at the Ouarkoye market.

It should be noted that sesame holds a rather unique position in the agricultural regime. It can be planted as a last minute crop in August. Reportedly, it requires only one hoeing, one weeding (or even none), and one good rain to succeed. So come August, farmers who find they have leftover time and labor often make an extra, late planting of sesame to augment their cash earnings. More important, sesame serves as a cash crop backstop in years of poor rain. As one informant explained, when

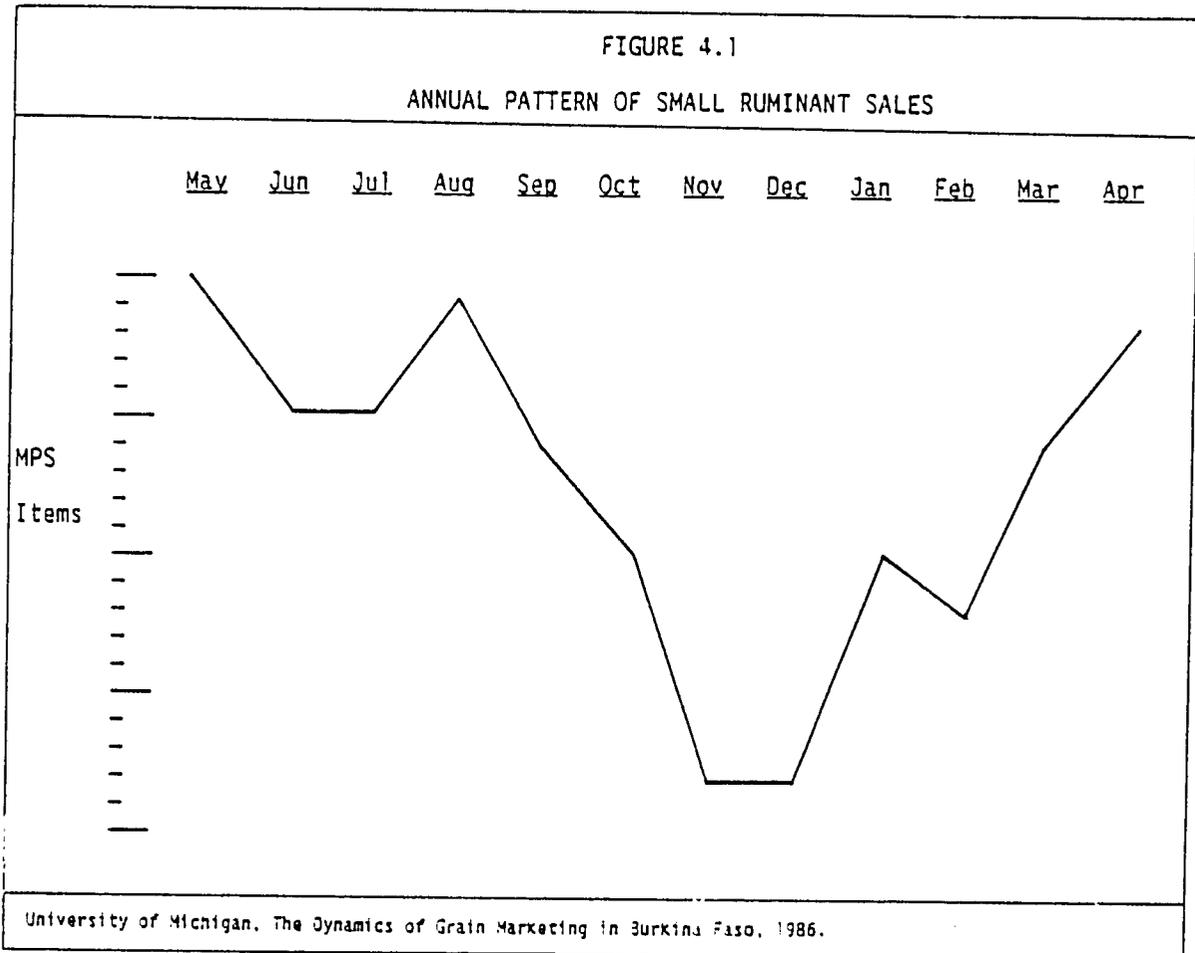
people see that some of their sorghum and millet fields will fail, they quickly reseed them in sesame, and perhaps add still more plots of sesame if time permits. With the earnings from these, they will then purchase staple grains. This was the case in 1983's drought year.

#### 4.2.6 Small Ruminants

Small ruminants play much the same role as poultry, but they are marketed when larger amounts of cash are required. Villagers will readily sell off sheep and goats "to meet our needs" or "to solve my small problems." One Bwaba aptly enunciated the gist of all MPS commentary on this item when he explained, "I keep sheep and goats for the purpose of rescuing myself when I need money." A Mossi likewise remarked, "Sheep and goats are raised in order to be sold, whereas grain is grown for eating." Other people added that, as in the case of poultry, it is always easy to find a buyer -- whether among ambulant livestock merchants, other villagers, or Ouarkoye butchers.

Small ruminant sales are made year-round. However, they are less frequent from September to February when farmers have many other products they can market instead, and when -- as one man explained -- "The animals are eating well, so you don't want to sell them." But along about March, sales begin to increase for a variety of reasons. Herds which have grown fat from postharvest stubble grazing and gleaning now find forage ever more scarce as the dry season progresses. So it makes good sense for owners to cull the weaker animals before they (and their market value) can waste away entirely. As the hungry season waxes, many families need cash for buying food grain. And across the hungry (= planting) season there is a slightly heightened demand for meat, for serving at work-party meals. Finally, some respondents further noted that the daily staking-out of sheep and goats during the growing season (so they cannot destroy the fields) can become such a chore that it is preferable to sell some off.

In an iterative, month by month application of the MPS, one exceptionally patient informant tracked his perception of the pattern of small ruminant sales vis-a-vis the other 19 MPS items. The pattern he outlined is shown in Figure 4.1. The slight peak in January represents holiday demands for meat. He explained the August peak by reference to cumulative wet season diseases which can strike the unstabled herds, plus



the hungry (= planting) season factors described above. Other informants also added that August is a good time to sell because, with the fresh growth of forage during the rainy season, the animals have by then regained much of their dry season weight loss.

#### 4.2.7 Peanuts

Like sesame, peanuts are viewed as a sauce item rather than a basic food stuff. Mossi in particular take this view, tendering comments like the following: "Peanuts are not an important thing in my family's diet." "My family doesn't eat peanuts very much." "You can't make a meal off them." "Peanuts are things we eat while waiting for the main dish to come; I prefer to sell them and hold onto my millet instead." Fewer Bwaba express these sentiments, but both ethnicities clearly deem this product eminently marketable.

The bulk of peanut sales are made to local traders. Again, these are the same men who deal in cereals and shea nuts. In December they come round to their clients' homes to collect the grain due them from advance sales and to purchase additional cereal if possible. With holiday expenses in mind, farmers often take this opportunity to sell the traders several tines of peanuts, as well. Advance sales of peanuts are also made, but reportedly more frequently to old women of the village than to merchants. Indeed, along with beer, grain cakes, and zombala (the nééré relish), peanuts are a major item of trade for women. They may raise them on their private fields or purchase them for resale; the peanuts may be marketed unshelled, shelled, or shelled and boiled; and the women may sell from their homes, door to door, or in the market.

Peanuts can be readily marketed at any time of the year and, like most of the food crops, their price rises across the postharvest period, peaking during the hungry season. The wise farmer will try to hold off at least a portion of his sales until then. But as with smoked karité and sesame, people will sell off some of their compound stocks of peanuts at any time of the year when small amounts of cash are needed and when preferred marketing items like poultry and small ruminants are unavailable.

#### 4.2.8 Pigs

It is interesting that Bwaba and Mossi rank this item identically -- even though, as good Moslems, Dankui Mossi do not raise swine. For them, the ranking was a highly hypothetical (but fortunately not offensive) task. For the Bwaba, however, pigs fill essentially the same role as small ruminants -- except that a goodly sized porker will fetch nearly twice the price of the average sheep or goat. In consequence, almost all the pigs "go to market." As one man exclaimed in ill-concealed astonishment at the anthropologist's ignorance, "Why else would you raise them?" The implication here is that, otherwise, one would not bother with swine herding because it is such a difficult business. Villagers complain that the creatures eat too much, and constantly trample and break things. Worse still, they root into other people's granaries and gobble up the grain, blithely leaving behind them a trail of tension and illwill between human masters and their neighbors.

Nevertheless, pigs are a profitable proposition -- especially if, as one man confided to me, "you slaughter them and market the meat yourself." That way, you can keep the entrails and even a portion of the flesh for your own consumption, while still realizing a tidy profit. As for so many other goods, the pork is sold door to door. There is little need to go all the way to market, since enough meat-hungry customers are usually to be found close at hand. This is a common porcine fate during the dry season, when forage becomes scarce. Farrow may be sold off then, too. Still, the majority of sales reportedly take place in December-January, when Bwaba particularly desire this prestige meat for their holiday feasts.

#### 4.2.9 Beans

Beans include cowpeas plus another sort of small, red, kidney-shaped bean. These are harvested towards the end of September and on into October. Farmers who have a good crop of beans may sell some at this time; so will people who have only a fair to poor bean harvest but who are still pinched for cash after the long hungry season. Although maize is also available in September-October, people prefer not to sell this critical crop if they can help it, because it must fill the staple grain gap until sorghum and millet ripen, towards the end of November.

Bwa informants say that September–October bean sales are by preference made to village women who market bean flour "doughnuts" across the rest of the year. These women are eager to obtain their annual supplies at this time, while bean prices are lowest. After October, prices will creep upwards, peaking out around February. During this, the coldest time of the year, beans are a highly valued food stuff "because they really warm you up." Villagers are quite correct in this assessment, in that the higher protein content of cowpeas and beans relative to cereals does work to combat cold stress. Some individuals further remark that "just a little bit of beans will keep you filled up all day long." The prudent Dankui farmer holds back a part of his bean harvest in unhulled form until February, and then sends a wife to sell by louche at Ouarkoye or Tchiookui. However, this is more easily said than done, because beans reportedly do not store well. Once hulled, say villagers, this food stuff must be consumed within a month or two lest it become worm-infested. Unhulled beans are more worm resistant. Even so, a number of MPS subjects indicated they preferred to avoid the risk of spoilage and instead consume and/or sell their beans early on.

#### 4.2.10 Loans from Relatives

This cash-getting option marks a clear and substantive division exactly at the midpoint of the aggregate rankings. With the expectable exception of the compound savings account (cattle), all the remaining nonloan items constitute either basic foodgrains or major equipment investments. At this point, too, we see the first signs of real divergence between Bwaba and Mossi. To wit, Mossi are much more loathe to take out loans of money from any source. They will sooner sell their cattle, their luxury transport (mopeds, motorcycles), and the luxury food grain (rice). In contrast, Bwaba will borrow money in preference to forced sales of these and other items. However, when a loan is required, the vast majority of respondents in both groups would turn first to relatives. This is hardly surprising. In contrast to loans from other sources, those from relatives are interest-free! This was the main consideration cited by respondents in explaining their preference for

loans from relatives. Other considerations included the following:

It is natural to turn first to one's relatives before seeking help from outsiders. (Several respondents made this point.)

A relative will have confidence in me and in my ability to repay.

Borrowing from a relative is faster (than borrowing from someone else) if I really need the money right away.

Money is always circulating amongst us [relatives]. It makes much more sense for us to borrow from each other than from a trader because that way we don't run the risk of arguments, or of being dragged before the police and the courts.

I can take longer to pay back a relative, but a trader will come after me with the police if I'm late in repaying him." And from another man, "A trader will not treat me humanely.

My relatives always try to understand me and my problems, but a trader may try to shame me in front of others." (This comment refers to the fact that when a man is in arrears on a loan from a merchant, the latter will go to the debtor's family to clamour for his money. He may also start a gossip campaign against the man and his family to pressure them into repayment. These are the first steps taken by creditors before turning to more drastic ploys like confiscation of goods or police action.)

Relatedly, "A relative will be able to keep the loan secret." In the same vein, another man explains: "If I borrow from a nonrelative, he may go sit in a tavern and start talking about me and maybe even say I borrowed more than I really did. Then, I will lose honor.

I prefer to borrow money from a relative -- and even from a trader -- rather than sell my foodgrain.

With regard to the penultimate comment above, roughly half the MPS respondents emphasized secrecy and/or honor as important considerations in taking out loans. Like irresponsibly selling off family foodgrain, borrowing money can be a shameful act indicative of inept corporate management<sup>6</sup> -- particularly if the money is for basic compound needs that could easily have been anticipated and planned for. People naturally wish to avoid this onus and, just as naturally, feel their secret is safer with a relative. Closely linked to the understandable

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<sup>6</sup>There are exceptions, of course -- for example, unexpected illness or death in the family, or a major purchase of agricultural equipment.

desire to avoid social sanction and stigma, there is another good reason for secrecy in borrowing, informants say. If word of a man's poor management abilities and his depressed financial situation gets about, he will be considered a dubious credit risk; it will be difficult for him to borrow from other sources should he need to do so. Once again, we see how sociocultural notions of "shame" and "honor" make good business sense.

#### 4.2.11 Loans from the Farmers' Group

Loans from the Farmers' Group (FG) can be made in two ways: directly from the Group to its members; or indirectly, to nonmembers via members who have taken out loans in their own names. In this fashion, FG funds are theoretically available to the village at large. In practice, though, the Group's operations and membership are totally dominated by the Bwaba; Dankui Mossi and, especially, Fulani have much less easy access to its credit resources. This fact is reflected in Mossi respondents' 16th place ranking of this cash-getting option, versus the Bwaba's 7.5.

FG loans are available usually only at one time of the year, according to Group decision. Normally, a period of the hungry season is decided upon. In 1983, for example, loans were given out in May-June; in 1984, funds were released earlier than usual (in March and April) to allow people to make already-crucial cereal purchases. All loans are repayable in January of the following year, with 50% interest. Those who cannot make reimbursement at this time must repay the loan with 100% interest by January a year later. Although this interest plan is the same for loans of money from traders, villagers prefer to borrow from the Farmers' Group because of fear of reprisals from traders if repayment is delayed. These reprisals may range from "shame" and institutionalized gossip (as noted earlier), through confiscation of goods, to court battles and imprisonment. At least vis-a-vis the "they" of traders, the Farmers' Group is "we." Or as one MPS respondent phrased it, "We are comrades. We all work together and know each other."

Informants also explained they would be most likely to seek an FG loan when they needed a really large sum of cash. (One definition of "large" given in this context was 30,000 FCFA or more.) Several men added that they could also thereby "consolidate" their loans, using a part of the FG monies to pay back relatives they might have borrowed from

earlier. Counter to the majority trend of commentary concerning loans from relatives, two men noted they would sooner borrow from the Farmer's Group -- one because he felt his relatives would demand excessive justifications for his need for money before lending it to him; another because he prefers to keep relatives in reserve as a last-resort source of cash, "And that way, too, I can show them that I really tried every place else before coming to them." In addition, several Mossi respondents stipulated that -- although to oblige me in "playing the game" of the MPS, they had ranked loans from the Farmers' Group and from traders as their 19th and 20th choices, respectively -- they would in fact never borrow from these sources. Their reasons had to do with paying interest and -- indirectly, I think -- with Moslem proscriptions on usury.

Finally, it should be noted that in addition to hungry season cash loans, around September the Farmers' Group makes advance cereal purchases, just as traders do. The grain is warehoused in the FG cereal bank upon collection in January, to be resold during the next hungry season. If stocks remain after preferred sales to members, the FG also gives out grain on credit the following August. Repayment is supposed to be made in kind with an in-kind interest of 50% by January. These sorts of transactions offer Dankui farmers an alternative to dealing with traders. However, as one informant points out and as an independent comparison of FG and local merchants' account books confirms, the injudicious farmer can all too easily overextend himself by the triple combination of advance sales to traders in August, credit loans of grain from the FG at the same time, and additional advance sales to the FG in September. Come January, he may find himself unable to satisfy all his creditors and may have to bear the "shame" of default and/or excessive harvest time grain sales.

#### 4.2.12 Moped/Motorcycle:

Quite a few people in Dankui own mopeds or motorcycles. This test item was included as something of a "wild card," to see how the option of selling off such expensive, luxury goods might influence decisions to market staple food grains or other major resources like cattle. Expectably, the majority (60%) of respondents answered that they would

sooner part with their mopeds or motorcycles than any of their cattle. Vis-a-vis foodgrains, only one of the 20 subjects indicated he might first sell off some cereal (in this case, sorghum) before divesting himself of motorized transport. But the universal feeling was that, while convenient and prestigious, mopeds and motorcycles can only exacerbate any financial problems because of constant fuel and repair costs. As evidenced in the 19th place ranking of bicycles and in repeated informant testimony, there was near-unanimous agreement that so long as one kept a bike, one could still conduct all necessary agricultural, marketing, and other business. Finally, informants opined that, if a man is forced to sell off such a hard-won item as his moped or motorcycle, he will likely do so in August-September when household resources are at an all-time low. Indeed, several such divestitures in August-September of 1983 were cited in support of this view.

A highly representative sampling of commentary on this item follows:

I'd sell the moped and keep the bike because all the breakdowns of mopeds cost a great deal of money to repair.

And from another man, "Bicycles don't need complicated mechanical repairs, and they don't drink gas." A third adds, "If I need money so badly, how could I afford to buy gas, anyway?"

"If I have a really big money problem, I would sell the moped/motorcycle and simply travel by bike. But in that case, I certainly would not sell my bike.

I could get more money selling the moped/motorcycle than I could raise by selling my grain.

"I think I'll just keep all these cattle," decides one informant as he evaluates his remaining MPS choices. "Cattle can reproduce, but mopeds can't." (Several informants echoed this logic.)

#### 4.2.13 Rice

When people have hypothetically exhausted nearly all their other, more usual cash-getting options, they will at last consider marketing some of their foodgrain reserves. Subjects point out that across the course of the agricultural year, they would most likely choose this option during the planting (= hungry) season. Then, they say, grain

prices are highest and cash for hosting work parties becomes critical. Not surprisingly, the first grain "to go" is the luxury cereal, rice.<sup>7</sup> Mossi are much more willing to part with this commodity than are Bwaba. All but one of the latter group emphasized that they would sell only a portion of their rice reserves -- "just enough to solve my small money problems;" "If there is sufficient left for my family and for seed;" "So I won't have to sell my millet."

In contrast, Mossi respondents sometimes said they would sell (all) their rice. More than half adduced the curious argument that rice is not edible without expensive condiments and special sauces, "So it costs more to eat." One man elaborated this observation by a comparison with beans: "You can boil beans and eat them just like that, without any sauce or even any oil. But not so for rice." Another Mossi declared that rice is plus léger "lighter" than sorghum; "were he to sell his sorghum and feed his family solely on rice," he says, "they would not be properly nourished." Bwaba waffle on this issue. One respondent commented that "Rice fills you up better (than sorghum); but of course, you can't eat it every day." Another Bwaba disagreed, saying "Rice is not heavy and filling like the other cereals. It soon leaves your stomach."

In contrast to this latter opinion, many villagers at other CRED sites reportedly feel that rice is more substantial and filling than the local coarse grains (Charles May: personal communication). This folk belief requires further investigation given that FAO (1970) data seem to indicate relatively little difference among sorghums, millets, and rices in caloric value per 100 grams of whole grain. However, an FAO family economist working in Burkina Faso tenders the suggestion that local people's higher ethnonutritional evaluation of rice may be tied to the sauces eaten with it. She notes that in some parts of the country, only certain sauces can appropriately accompany rice. Echoing some of the Dankui Mossi's commentary, she adds that these sauces generally involve

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<sup>7</sup>Rice is harvested in September, but my distinct impression is that few sales are made at that time -- both because farmers entertain hopes of holding onto their rice until the higher prices of the hungry season, and because they have many other marketing options at this time (notably shea nuts and maize, but also peanuts).

more expensive -- and at the same time, more nutritious -- ingredients like meat, fish, or fowl, and oil. In any case, more research into the why and wherefore of ethnic foodgrain preferences -- and hence, too, of marketing or purchasing preferences -- is needed, from both an emic and an etic perspective.

#### 4.2.14 Maize

Maize shares much the same marketing position as rice, i.e., surpluses and/or a limited portion of the family stocks may be sold off during the hungry season. Respondents indicated they generally would rather do this than take a loan from a trader. In fact, though, it is rare that a compound would have any maize left when the planting season arrives. In Dankui, most maize is consumed as it is harvested across the months of September and October. This grain must keep the wolf from the door until sorghum and millet ripen, towards the end of November. At that point, however, farmers may again market some of their remaining maize for stopgap cash until shea nut money is in hand. A little more maize may be sold in December when merchants come round to collect their advance purchases and when villagers are seeking quick cash for holiday expenses.

#### 4.2.15 Cattle

As noted in the discussion of loans from relatives, Bwaba will less readily part with their cattle than will Mossi (a 4.5 difference in ranks), but neither group is overly keen to make many cattle sales. They adduce two principal reasons for this reluctance. One is that cattle are such a major -- and happily, self-regenerating -- source of income<sup>8</sup> that care must be taken not to prejudice the herd's reproductive potential by selling off too many animals. The second and more provocative reason is that cattle serve as the single most visible sign of a family's fiscal status; they also constitute Dankui farmers' major, long-term "savings account" option. As such, cattle figure heavily in compound "credit ratings," ultimately providing the implicit collateral behind many credit transactions. Selling off cattle in any quantity

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<sup>8</sup>Aside from sales of animals for butchering or breeding, a number of Dankui Bwaba also make an income from raising and training plow oxen for sale.

therefore incurs "great shame," informants say. When pressed to expound upon this recurrent notion of shame, but now in the context of cattle marketing, respondents' rationales ran roughly as follows (paraphrased from several individuals):

If you start selling off a lot of your cattle, people will talk about you, saying "Look, he's selling his cattle!" Then, after you have sold all your animals and you still need money, who will lend to you? Everyone will know, from hearing all the talk, that you have no way to repay them. And once you have sold your cattle, it will be very difficult to build up another herd again. It is better to borrow money and keep the cattle, for they can continue to reproduce. Then you can sell a few later and use the money to repay your loans. This way, you will become known as a trustworthy man, and you will be able to borrow money in future times of need.

Although a somewhat convoluted explanation, the gist of the foregoing should be clear: cattle essentially constitute the indigenous "savings and loan" (S&L) institution.<sup>9</sup> The clear consensus across both Bwaba and Mossi is that -- while it is perfectly acceptable to sell off a head or two of cattle now and again in order to meet traditional obligations like fetes, marriages, and funerals, or to deal with occasional emergency situations calling for sizeable amounts of cash -- it is tantamount to a declaration of bankruptcy if a man is forced to draw down his S&L account completely. With no cattle "savings" he will realize no calf "interest" earnings; and with no bovine collateral against which to borrow, he will have difficulty obtaining loans. Only a very foolish compound manager would decimate his cattle account before exhausting all other, less critical resources. To do otherwise is to court financial ruin.

With regard now to timing of cattle sales, Bwaba and Mossi<sup>10</sup> are

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<sup>9</sup>This perspective offers some insight into the larger debate on the rational, socioeconomic bases of overstocking in the Third World generally -- despite local environmental degradation brought on by overgrazing, lowered overall herd health and nutrition, increased household labor and management drains, and so forth.

<sup>10</sup>Fulani follow a different overall marketing strategy for cattle. Their sales reportedly peak in March-April. At this time they cull animals which have been weakened by the dry season's scarcity of water and forage and which may therefore succumb to diarrheas and other ailments at the onset of the rainy season. They sell few cattle during the rainy season, preferring to let the animals fatten, and marketing only the milk meanwhile.

largely in agreement along both ideal and real parameters. Both groups indicated that, ideally, cattle should be marketed when prices are highest. In response to queries about the "best time to sell," sample members named two periods. One is December-January, when holiday demand for meat is high and cattle are fat from gleaning and stubble grazing. The other is from late July into October -- when, after several months of lush, wet season forages, cattle are generally heavier and healthier, and so fetch a better price. Mossi also point out that the two major Moslem feasts currently fall in or around this period, (e.g., in 1984 Ramadan was celebrated in July, and Tabaski in September).

While the foregoing represents Dankui farmers' ideal cattle marketing strategy, they are the first to admit that, in reality, they are often obliged to sell a few head at nonideal times -- in "moments of necessity," as they phrase it. On the MPS, the most commonly cited of such "moments" included family illnesses, work party expenses and meals, taxes, and the need to buy foodgrain during the hungry season.

In either case -- real or ideal -- the marketing channels are the same. Cattle may be sold to the long distance traders (or their factors) who travel through the region on their way to markets farther south. These men come to people's homes soliciting sales; alternatively, a farmer who hears there is a cattle trader in the area may seek him out. Sales to local butchers are made in the same ways. And transactions between Dankui villagers or between them and members of neighboring communities are frequent. Never, however, are cattle sold in marketplaces in the immediate region.

To conclude, so long as a man sells only a small portion of his herd, there is no "shame" in cattle sales at any time of the year. Cattle are kept as investment and collateral, but also as savings to cover valid major expenses. This disposal strategy precisely parallels that found among farmers in other parts of Burkina Faso. Writing of the Mossi plateau, the words of one Burkinabé specialist in animal husbandry apply mutatis mutandis to cattle marketing among the Bwaba and Mossi of Dankui:

"... les producteurs ... prélèvent chaque année sur leur troupeau quelques têtes pour la vente. Ce prélèvement est conditionné par la satisfaction des besoins monétaires de l'éleveur qui en general sont: funérailles, impôts, achat de céréales, habillements, fêtes, etc. (p.16) ... le bétail est

considéré comme un capital permettant de faire face à des dépenses exceptionnelles et non comme une source régulière de revenus" (Nitiema, 1979:16, 88).

#### 4.2.16 Loans from Traders

Respondents' general views on this MPS item have already been outlined in the earlier sections on loans from relatives and the Farmers' Group. As its 16th place ranking indicates, borrowing from traders is basically a "last ditch" cash-getting option. It is preferable only to selling critical stocks of food grain and going hungry, or to selling off factors of production essential to the economic unit's continued operation. Nevertheless, despite the threat of powerful sanctions both in the internal and external community, farmers may turn to traders when all other options are exhausted. In such straits, informants say they will at least try to seek out an honest trader, or one with whom they have had satisfactory dealings in past.

Loans of money from local traders can be repaid in cash or kind, but the form of repayment must be stipulated at the time of borrowing. Here, "local traders" refers to two types of individuals -- both of whom also farm, however. One type consists of merchants who bulk cereals, shea nuts, and peanuts on a commission basis for large-scale dealers in the nation's cities, but who also buy, stock, and resell grain locally across the year. The other type are men who only bulk on commission; they do no retailing on their own account. Both types of traders naturally prefer repayment in kind (i.e., advance transactions). Only the first type is in a position to make purely monetary loans, and he does so reluctantly and usually only with preferred clients.

A major source of strife between farmers and traders arises when, in poor harvest years, farmers see that they have overextended themselves in advance sales. They may then try to repay the merchant in money rather than in-kind, as originally agreed. Traders complain that, in fact, dishonest farmers surreptitiously sell the promised grain at the higher market prices of a poor harvest year and then whine to their creditors that crops were so poor they can repay in grain only at the peril of family famine. The farmer then offers to return the trader's money. But quarrels are almost certain to ensue, especially if the farmer also tries to avoid paying any interest on the loan.

Because of potential problems in repayment and the social and official sanctions on default, farmers are leery of taking loans from traders. Informants repeatedly emphasized that they would do so only "if there is absolutely no other solution," and "when truly I have no other choices." A representative sampling of commentary on this cash-getting option follows:

Borrowing from traders can put you in a very difficult position financially. A wise man will not get himself into such a deplorable situation.

I suppose I would risk borrowing from a trader before selling my millet and sorghum or my bike and my cart. But only if the trader will wait for repayment until after the next cotton harvest.

I prefer borrowing to letting go my food.

Even if I don't like the idea, I prefer to borrow from a trader than to sell my cereal, because [feeding] my family is my first responsibility.

I prefer to take a loan from a merchant and keep my sorghum, because if my sorghum finishes, everyone will see me running from right to left. (I.e., "like a chicken with its head off," not knowing what to do.) As an elder head of family (compound head) I will not ever sell my sorghum.

The thought of borrowing from a trader does not please me -- no, not at all. That fellow in the photograph there can do so if he likes, but not me!

To conclude, informants also opined that young compound heads and poorer people are more prone to take loans from traders. But in a bad harvest year, even experienced compound managers and normally comfortably well-off families may find themselves in this "deplorable situation." Finally, such loans are most frequently made towards the latter part of the hungry season when all other compound resources have been expended.

#### 4.2.17 Millet and Sorghum

I discuss these two items together because informants' ranking rationales and their comments on quantities and timing of sales of the two are so congruent. In view of their 17th and 18th ranks, and given the weight of informant commentary on the preceding 16 items plus the evidence from Chapter 3, there is really very little to add here. Millet

and, especially, sorghum are the "bottom line" when it comes to a Burkinabé farm family's nutritional, economic, social, and ideological well-being. In consequence, there was great resistance among MPS subjects to the notion of selling off the compound's staple foodgrains. Recall from the last chapter that the ultimate community ideal is to make no commercial cereal transactions. Although in reality this ideal is achieved by relatively few men each year, informants were clearly attending to it in their scalings. Almost to a man, subjects stipulated that only with great foreboding would they sell even a little of their basic compound cereal stocks unless there were a clear surplus.

Nevertheless, with an honest pragmatism, many respondents confessed that sometimes "in absolute necessity" "when I have a surprise need for money" or "when I am in true difficulties" they might be forced to dip into family reserves and quickly sell a bit of grain. (In this context, "a bit" was defined as one to six tines.) In such case, the majority (78%) indicated that the relative market price of the different cereals would be immaterial in their choice of which to sell. Rather, they would select "whichever one I have the most of." However, this is not to say that farmers are unaware of or unconcerned about price differences. As one man states, "One always tries to get the maximum amount of money for the minimum amount of cereal." But another adds the caveat, "If I am in such great need as to sell my foodgrain, it really won't much matter what the price difference is."

Still, it is probably no accident that, in the aggregate, millet ranks above sorghum in sales preferences; the market price of millet in the Dankui region is normally higher than that of sorghum. It is also no accident that Bwaba reverse the aggregate rank and are more reticent than Mossi to sell their millet. This cereal holds a special place in the Bwa diet because it is the traditionally prescribed grain for many ceremonial feasts and formal meals (as when the CRED director comes for dinner). Millet appears to enjoy no such status among Dankui Mossi. Quite the contrary, they claim it is slightly inferior to sorghum in the following respects:

[The same volume of] millet makes up into smaller amounts of (to) than sorghum, so it takes more millet to make a full meal.

Millet has slightly more bran than sorghum.

For me, sorghum is the more necessary cereal because [the same volume of] sorghum yields up a little more flour than millet.

Sorghum is better than millet, both in taste and in filling you up.

In any case, both ethnicities' ideal assessment of foodgrain sales is the same; and gratifyingly, this assessment closely parallels findings from CRED's rural rapid reconnaissance (RRR) research throughout the country at large. One can do little better than to paraphrase from the Dejou et al. in-house RRR report:

Even in surplus areas, the unanimous answer to the question "Why are you selling your grain?" is 'Because we have to.' It seems that nobody chooses to sell grain. They do so only out of necessity. They would very much prefer to keep their grain, even if they think they have enough to last them through the next harvest. This explains the rather small quantities they are selling. In good years, when people have adequate stocks of grain, they would doubtless sell more. But always, sales are made because people need money -- e.g., for ceremonies, taxes, and other expenses. The timing of sales depends upon: first, when farmers need the money; second, what else they could sell instead; and third, allowing for the first two considerations, the best season in which to sell, relative to price and risk.

For Dankui farmers, the "best season in which to sell" is the hungry (= planting) season (May to September). They point out that prices are highest at that time and that they always need money for work party expenses then, too. Also, recall from Chapter 3 that sales to one's social network during this difficult period earn "honor" and prestige.

#### 4.2.18 Bicycle and Cart

Again, because of their similar ranking rationales, these last two MPS items are discussed together. Basically, most respondents perceived their bikes and carts as much too critical to essential agricultural, marketing, and other tasks to be sold off "except in total crisis." There was particular resistance to the idea of parting with one's cart. Two principal reasons were cited in this regard. One was the current cost of a new cart -- between 75,000 and 85,000 FCFA according to the secretary of the Farmers' Group. There was a fear that, once one's cart

were sold, it might prove too difficult ever again to amass the capital and/or credit to purchase another one. The second and more frequently cited reason for this item's last place ranking was that carts can be an important source of income. They can be rented out as transport, and can be used to collect and haul firewood, and other goods to market. Or as a number of respondents put it, "a cart brings in cash" and "it can always produce money for us." "So," concludes one man, "if I sell my cart, my poverty will be even greater."

There was only slightly less resistance to the notion of selling one's bicycle, for much the same reasons. As some informants pointed out, a bike allows one to range farther afield in search of work or of more advantageous markets. Still, faced with family famine, respondents allowed as how they might be forced to part with this important piece of equipment. A sampling of their remarks follows:

When I have nothing more to eat, I will sell the bike in order to buy cereal.

I will sell my bike if I see that my grain is all gone.

How can I keep my bike if my children are crying for food? That is not normal. So, I will sell the bike and purchase grain.

If it's a question of eating or not eating, I will sell my bike and just walk.

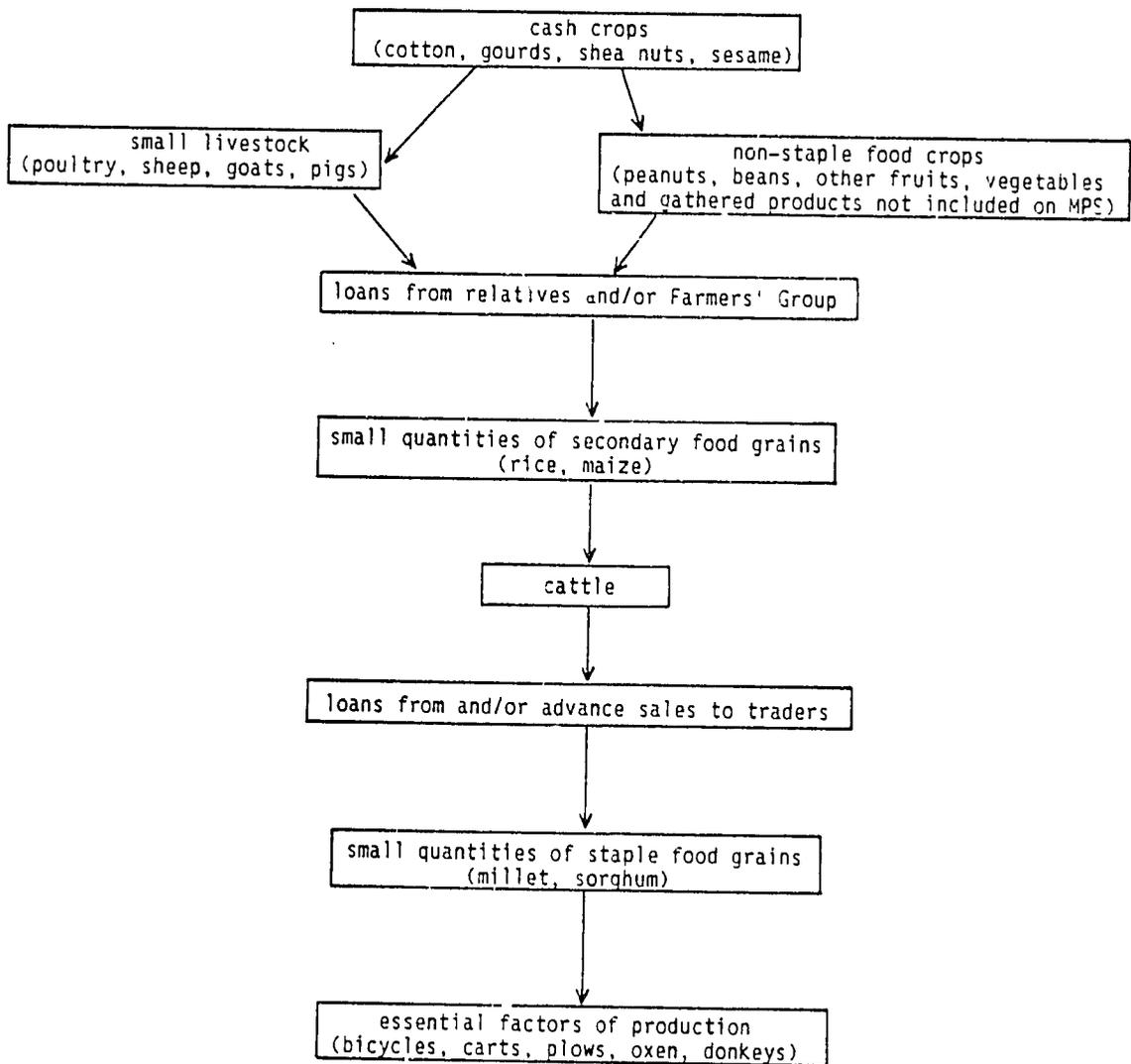
Finally, farmers noted that if actually brought to the point of selling their carts and bicycles, this would most likely occur late in the hungry season and only when no other cash-getting options were left.

#### 4.3 CONCLUSION: DECISION MAKING CRITERIA AND PROCESSES

The preceding sections have reviewed MPS results on an item by item basis with the aim of discovering in what ways, when, and why farmers may ideally prefer one marketing or cash-getting option over another in managing their compound-level resources. Figure 4.2 following presents a visual summary of the MPS's "what" and "when" findings. Figure 4.3 offers a more distilled, atemporal version of these results. The reader should bear in mind that both these figures depict an aggregate ideal. Any individual farmer's preferred sales strategies may differ somewhat, according to his compound's particular socioeconomic situation and/or his



FIGURE 4.3  
SUMMARY OF DANKUI FARMERS'  
ABSTRACT/IDEAL CASH-GETTING PRIORITIES



own personal priorities and beliefs. Moreover, farmers in general may often be forced by circumstance to deviate from their ideals. Some (but by no means all) of this variety in socioeconomic situation and in individual or other circumstance can be appreciated in an overview of findings from this study -- both qualitative and quantitative, MPS and non-MPS. From this overarching perspective, there emerges the following, minimal list of considerations at work in Dankui farmers' marketing decision making:

1. The amount of cash required by the farmer at any given time.
2. Relatedly, the speed with which the cash must be obtained.
3. The relative quantities of each marketable resource the compound has on hand at any given moment.
4. Vis-a-vis (3) and ceteris paribus, a clear-cut distinction in marketing preference between cash crops and other crops, between small livestock and cattle, and between "sauce" items and basic food stuffs.
5. Vis-a-vis both (3) and (4), projected annual compound needs for each resource in nutritional, agricultural, economic, political, and ideological domains. Needs will naturally vary according to such sociostructural factors as compound size and composition, and lineage standing. The latter in part determines the range of extra-compound economic/ceremonial/etc. obligations to kin and, conversely, the rights of access to extra-compound labor.
6. The seasonal availability and condition of different resources, both plant and animal. This consideration is a function of production cycles, "storability" or "processability" of products, and ecological variables like the existence and accessibility of water and forage for livestock. (3) above is partially epiphenomenal of (6).
7. The relative price of different resources at different times of the year. With the exception of ceremonial demand, this consideration, too, is largely an epiphenomenon of (6).
8. The relative price of a resource marketed in unprocessed versus processed form -- e.g., dried versus smoked shea nuts vs. karité butter; livestock on the hoof versus livestock already slaughtered and butchered versus trained plow oxen.
9. Relative prices to be obtained by selling at home or in the market (e.g., by louche) vis-a-vis considerations of time,

transport, and fatigue, particularly in the hungry (= planting) season.

10. Externally fixed transaction times for certain cash crops -- notably, cotton and shea nuts. I.e., the relative timing of sales of different items.
11. The availability of different types and terms of credit vis-a-vis maintenance of a good "compound credit rating" -- particularly with regard to cattle holdings.
12. Relatedly, the risks of social and/or official sanctions in credit dealings, and of negative reciprocity in any dealings with merchants.
13. Possible sources of cash other than from sales or loans -- e.g., salaried labor, remittances.
14. Complex sociocultural "codes of honor," particularly with regard to cereal disposals and, to a lesser extent, cattle sales.
15. Ethnonutritional beliefs and ethnogustatory preferences. These may vary by ethnicity.

This list -- presented here with no pretence of hierarchization -- catalogs a complex, interlocking constellation of economic, ecological, and sociocultural considerations in farmers' marketing decision making. Doubtless the reader could adduce still further factors. The original hope was to fit these considerations into a detailed, hierarchical decision making model (HDM) utilizing branching tree diagrams à la Christina H. Gladwin (e.g., 1976, 1982, 1983, and forthcoming; see also Bartlett, 1980) and others. However, there are some reservations and drawbacks to this approach. First, of course, is its highly cognitive orientation. Second, this technique has so far been applied only to much more delimited areas of inquiry -- most notably, to agricultural production decisions. To my knowledge, HDMs have not yet been attempted for the complexities of subsistence farmers' marketing decision making.

In any case, the MPS provides the first step towards more formal modeling efforts in that it reveals many of the criteria farmers themselves deem important in their decision making. The next step in this discovery and modeling process is being carried forward by the CRED economics team in the other four village studies through application of a revised and more reality-oriented version of the ranking scale designed in Dankui. Labeled the 'SPIG' or Sales Preference for Income Generation,

along with other refinements this instrument limits itself to the major, marketable goods and cash-getting options actually available to each subject in the sample population. In contrast to the MPS's "aggregate ideal," the SPIG seeks to elucidate the "individual real." When these two approaches are melded, it should be possible to identify still further factors figuring in farmers' marketing decisioning, then group all such factors into higher-order variables and prioritize these "macrovariables" in a formal model -- be it cognitive, economic, or mathematical.

## CHAPTER 5

### CONCLUSIONS AND POLICY IMPLICATIONS

As per basic objectives of the CRED Village Studies, research for this report has focused first upon identification and description of different types of grain disposals to be found in a Burkinabé farming community. A principal outcome of this baseline descriptive work is a thorough-going appreciation of the pervasive importance of cereal crops to farm families' existence -- not only in immediate economic and nutritional realms, but also in daily social, ceremonial, and cognitive life, and in long-term supra-household food security systems as well. From this perspective, extra-village marketing of grain comprises but one among more than a dozen disposal types, many of which take socio-cultural, socio-economic, nutritional, or production priority. Indeed, large-scale marketing represents a grain disposal option which, under the current farming system, if irresponsibly exercised (particularly in a drought year) can threaten both family and community well-being.

In this regard, a second major outcome of the anthropological research is discovery of a socio-economically adaptive "code of honor" informing Dankui farmers' compound-level grain disposal decisions. This code is particularly precise with regard to sales. In essence, it advises the following, ideal hierarchy of marketing behavior: no grain should be marketed from compound production unless a surplus clearly will remain after all other anticipatable disposals are budgeted; this surplus should be offered for sale first to kith and kin; second to co-villagers or to the community at large, e.g., through the Farmers' Group; and lastly to "outsider" individuals or institutions. Additionally, the code advises farmers to stave off grain sales until the hungry season. Then, prices naturally rise as local cereal supplies decrease, and as demand among less successful and/or prudent farmers cum corporate managers increases. Sales to kith, kin, and co-villagers at this time of the year earn "honor" for the seller, who is seen as a wise administrator of compound resources and as something of a community benefactor. But the highest kudos of all goes to men who make no commercial cereal transactions across the year, and who not only meet all of their own

compound's annual grain needs but also donate hungry season surpluses to their less fortunate fellows.

In the ultimate analysis -- as attested both by qualitative data from intensive interviewing and by the more quantitative findings of the MPS -- grain is not a preferred market commodity in contemporary Dankui.<sup>1</sup> Farmers in this relatively rich ecozone of Burkina Faso have many other agricultural marketing alternatives. Principal among these is cotton, the community's cash-getting "king." According to oral history, however, cotton was not always "king." Rather, its rise to this position began only some twenty years ago. Before that time, it reportedly played a role similar to that of gourds today. Most compounds cultivated a patch of cotton for their own consumption; a few also raised an extra bit for local markets. The stellar rise of cotton to cash-crop "kingship" in Dankui was evidently a direct response to vigorous SOFITEX/ORD and earlier CFDT campaigns promoting this cultigen.<sup>2</sup>

As noted in the preceding chapter, SOFITEX and ORD programs offer farmers an extremely attractive support package spanning most technical and economic aspects of cotton production and marketing. For example, fair and relatively easy credit terms are available for purchasing yield-increasing inputs like fertilizers and insecticides, plus agricultural equipment like plows and harrows. Moreover, an ORD extension agent is permanently housed in the village to train and advise farmers in the use of this intensive chemical and mechanical technology.

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<sup>1</sup>In this regard, Dankui farmers express overall satisfaction with their normal grain market outlets -- i.e., relatives, friends, and neighbors; the Farmers' Group; and the local marketplaces. Only when they feel forced by economic emergency to deal at a disadvantage with grain traders do villagers express discontent with the marketing structure. However, they also complain that, particularly in drought years, their grain purchasing options are too limited.

<sup>2</sup>Before cotton, peanuts reportedly were a primary cash crop of Dankui. Informants all agree that cotton was not raised commercially before 1959-60. Then, SOFITEX's ancestral company, the CFDT, began to encourage this cultigen. Informants add that by 1962, nearly all villagers grew at least some cotton for sale. In 1964 the CFDT installed an extension agent in Dankui to further promote cotton cultivation, and by 1966 overall production within the community reportedly had increased dramatically. Thereafter, villagers say, the quantity of cotton grown in Dankui has steadily risen.

Furthermore, SOFITEX distributes treated cotton seed free of charge and delivers it gratis, along with all fertilizer and insecticide, directly to the village. Likewise, the company provides for local pickup of harvests.

With regard to pricing and purchasing, SOFITEX has instituted a number of shrewd policies. One is the timely announcement of annual prices just before the planting season, thus allowing farmers to make more informed production decisions. Second, SOFITEX guarantees purchase of all the cotton a farmer can produce; and large producers are accorded preferred price, pickup, and payment treatment. Third is the special timeliness of purchase -- in December-January. Then, people experience their major cash needs of the year in the combined form of taxes, school fees, two closely-spaced sets of holiday expenses, and loan repayments both to the Farmers' Group and to other local creditors. At this time, too, many farmers must recompense work party or salaried labor hired during the harvest. Indeed, the "timeliness of payment" feature is cited by most producers as a major motivation behind their decision to raise cotton. They further emphasize their appreciation of the fact that payment is made "on the spot" in a lump sum -- again, just when household "liquidity" problems loom largest.

A fourth feature of SOFITEX purchasing procedures and policies which farmers appreciate is the promptness and, in their words, "preciseness" of operations. Farmers feel they receive convenient, efficient, fair, and honest treatment in their commercial cotton dealings -- in direct contrast to their dealings with grain traders. For example, the cotton company normally makes two pickup rounds in Dankui. The second and later visit is designed to accommodate producers who, for whatever reasons, were delayed in their harvesting. On each round, SOFITEX agents weigh, grade, and load the cotton at collection stations in the fields, with the producer himself looking on and with local RD officials and (frequently) ORD representatives standing by to verify all matters of quantity and quality of the sale, total transaction price, and all credit reimbursements.

Closely related to the foregoing, in farmers' view there is a fifth and overarching "plus" to cotton production and marketing. To wit,

SOFITEX's reliance upon local FG and ORD personnel to direct most of the seed/fertilizer/insecticide distribution, credit extension and accounting, pickup and payment operations, and so forth. These men are responsible and trustworthy figures who are well-known throughout the village. In the case of FG officers, they also represent some of the community's most informed and successful farmers. With these individuals at the interface of nearly all cotton-related transactions, their co-villagers feel more confident and secure in embarking upon large scale, commercialized cash cropping.

Finally, it should be noted that SOFITEX pursues a special policy of rewarding "good" cotton-producing villages. Good villages are defined as those which follow all ORD technology recommendations and which thereby achieve consistently high yields, e.g., two tons per hectare or more. In reward, the company will donate a clinic, a maternity ward, or a school to the community (SOFITEX Dédougou: personal communication).

Now, it may at first glance seem strange to conclude a study of grain marketing decision making with a discussion of cotton commercialization. However, as is often the case, a comparative analysis of congruent (and sometimes even competing) phenomena can prove illuminating. I have dealt here at some length upon the functioning of SOFITEX and its successful push of cotton as a major cash crop because these experiences could conceivably offer an empirical model for similar endeavors in cereal production and marketing elsewhere in Burkina Faso. The brief description of SOFITEX operations just presented derives solely from farmers' own statements and from one interview with the directorship of the company's Dédougou branch. Further research -- e.g., into the full evolution and design of company policies and management structures at all levels, and into cross-time production data -- would certainly shed much more light upon the underpinnings of SOFITEX's success.

Nevertheless, even this brief examination speaks to a number of issues pertinent to CRED's mandate to investigate farmers' marketing decisioning. Coupled with the preceding two chapters' detailing of producer commentary concerning commercialization of both cotton and cereals, it seems clear that Burkinabé farmers are responsive to prices and price stabilization, cognizant of concrete issues of transport and

convenience in their marketing, open to new technology and extension efforts which reduce agricultural risks, appreciative of fair and efficient business practices and of accurate weights and measures, capable of organized community action (e.g., through FGs) to take advantage of economic opportunities, eager to obtain credit, and sensitive to the complex competition between cash and food cropping.

## APPENDIX

APPENDIX A: The Producer and Consumer Units  
Tables A.1, A.2, and A.3

Appendix B: First Intensive Interview

Appendix C: Second Intensive Interview

Appendix D: Third Intensive Interview

Appendix E: Wealth Rankings

## APPENDIX A

### THE PRODUCER AND CONSUMER UNITS

Initially, it was hoped that the producer equivalents set forth in Sherman's (1984:92 ff.) report on grain marketing in Upper Volta could be utilized directly for this report as well (cf. Table A.1) since there was no possibility for CRED to derive these units in firsthand research. However, Sherman's figures -- which were in turn based upon Matlon's (1977) doctoral researches in Nigeria -- did not appear to accord well with the Dankui reality. For one thing, given the relative respect, power, and hence lessened agricultural duties which oldsters enjoy in the village, a fifth age category for producer equivalents seemed indicated. For another, there was a clear difference in agricultural labor by sex across ethnicity, such that Fulani females needed to be factored out of these calculations. Finally, the agricultural contributions of both Bwa and Mossi adult woman seemed greater than 0.6 of an adult male's of the same ethnicity.

Consequently, the Matlon-Sherman figures were modified as shown in Table A.2, based upon village research assistants' advice, on researcher observation, and on conversations with Matlon himself. While these figures are still imperfect (e.g., Fulani women occasionally do help out in the fields), they nevertheless provide a closer approximation to Dankui behavior than do the Nigerian data. In contrast, no reason was found to merit modifying the Matlon/Sherman consumer equivalents (Table A.3), so these were utilized "as is" for the Dankui calculations.

TABLE A.1				
PRODUCER EQUIVALENTS: MATLON/SHERMAN				
SEX	AGE			
	<u>0 - 4</u>	<u>5 - 9</u>	<u>10 - 15</u>	<u>16 +</u>
Male	0	.25	.8	1.0
Female	0	.25	.5	.6
University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.				

TABLE A.2					
PRODUCER EQUIVALENTS: DANKUI					
SEX	AGE				
	<u>0 - 4</u>	<u>5 - 9</u>	<u>10 - 15</u>	<u>16 - 55</u>	<u>56 +</u>
Male	0	.25	.8	1.0	.7
Female <sup>a</sup>	0	.25	.5	.8	.5
NOTE: (a) But with the exception that Fulani females were assigned a zero value.					
University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.					

TABLE A.3				
CONSUMER EQUIVALENTS: MATLON/SHERMAN AND DANKUI				
SEX	AGE			
	<u>0 - 4</u>	<u>5 - 9</u>	<u>10 - 15</u>	<u>16 +</u>
Male	.2	.5	.75	1.0
Female	.2	.5	.7	.75
University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.				

APPENDIX B  
FIRST INTENSIVE INTERVIEW

SELLING

1. To what sorts of people or groups have you sold grain between January 1983 and now? (Merchants, merchants' agents, relatives, the GV, other villagers, other producers from other villages, OFNACER, ORD, functionaries, direct sale in the market place, any other channels.)  
Note to interviewer: List and letter each transaction and identify by letter throughout the following questions.
2. What are the names (if known) and social relationships to you of each of these purchasers?
3. What crop and quantity were involved in each transactions? At what price did you sell in each instance?
4. Did you or the other party initiate the transaction? Where did it take place?
5. What month was it? What was your reason for selling then (see code list for prompts)?
6. Did any of these transactions represent handing over of advance-sale lots of grain? Did you make any such sales of this year's crop? To whom, when, what, and why? What were the precise terms and times involved? Do you normally make such sales every year? Will you do so this year, do you think? If so, to whom will you sell? Why to this person?
7. Are the channels named above those through which you regularly (i.e., just about every year) sell? If yes, why do you use these channels rather than others? (Price, convenience, known availability, no transport costs, they're the only channels available, moral obligations, special considerations, nonnegative reciprocity, other.) If these were not your normal channels, why did you sell in the fashion when you did?
8. Was this past year fairly representative of your annual grain sales, or were quantities greater or less? Why?
9. In general, do you sell the most grain shortly after harvest or do you wait until later? Why? If later, when? Why sell at this time?

- (Price, clear that household consumption is assured, next harvest looks good, storage problems, other.)
10. That sales have you already made of this year's grain harvest? How much, to whom, where, when, why, etc.?
  11. Do you or anyone in your family ever plant a field of grain expressly for sale? Did anyone do so last year? Was the grain in fact sold? Why or why not? To what use were the proceeds put?
  12. Same question for this year's harvest.
  13. Do you plan to make other grain sales between now and the next harvest? Why or why not? If yes, what quantities of which grains? To what people or agencies would you hope to sell (see question 1). Again, why these channels?
  14. In Dankui, who are the people who sell the most grain? (Try to get at least three names.) In what sort of quantities do you estimate they sell which grains? To whom do they mostly sell? (Possible to rephrase this question -- if there is resistance -- to "who are the best farmers in Dankui?")

#### BUYING

1. From what sorts of people or groups have you bought grain between last January and now?
2. What are the names (if known) and social relationships to you of each of these sellers?
3. What crop and quantity were involved?
4. Where did the transaction take place?
5. What month was it? What was your reason for buying then?
6. Were any of these purchases made on credit? What were the precise terms and times involved?
7. Are the channels named above those through which you regularly (i.e., just about every year) buy? If yes, why do you use these channels rather than others? If no, why did you use them when you did?
8. Was this past year (January to January) fairly representative of your annual grain purchases, or were quantities greater or less? Why?
9. In general, during what months do you buy the most grain? Why then?

10. Do you ever buy grain just after harvest? Did you do so last year? Where, from whom, how much, for what purpose? (Supplement existing stocks, resale, remittance, processing and resale, other.)
11. Did you/are you going to do so this year? If so, most likely where, from whom, how much, for what purpose?
12. At any time, do you buy grain for resale at a profit? Last year? This year? Where, from whom, what quantities, types, etc.
13. Do you plan to purchase much (more) grain between now and the next harvest? Why or why not? If yes, what quantities of which grains? From what people or agencies? Why these channels? From what source will the purchase money come? (Cotton, livestock, other sales; remittances; loans; other.) If there is no grain to be had through these channels, what will you do?
14. In a "normal" year, would you say you buy more grain than you sell, sell more than you buy, sell and buy about the same, sell only, buy only, or make no grain transactions?
15. In a "normal" year, do you sell grain just after harvest and then purchase grain later on? If so, when? And why do you do so? (Livestock considerations; debts; other immediate cash needs, e.g. taxes, school fees; use of capital in interim for commerce; other.)
16. Overall, how do you think this upcoming year may be different from "normal" ones with respect to your grain purchase and sales?
17. Do you know of anyone else you haven't yet mentioned, in neighboring villages or elsewhere, who buys or sells grain? (Name, ethnicity, occupation, location, disposition of grain, if known.)

#### OTHER INFLOW AND OUTFLOW

1. How many labor parties did you host for what purposes, between last January and this? How was the workforce composed? How much grain of what types did you use for these events? (In food, drink, payments in kind.)
2. How much grain of what kind did you pay out for other harvest time work or any other tasks during the past year?
3. How much grain of what kind did your family members take in over the past year in return for labor? Who has/had control of this grain and how was it/will it be used?

4. Have you lent grain to anyone during the past year? To whom, how much, when, and why? When, in what form, and with what interest (if any) will the borrower(s) pay it back?
5. Conversely, have you borrowed grain from anyone during the past year? From whom, how much, when, and why? How and when will you re-pay it? Is it likely you will borrow this year? If so, from whom, when, why, etc.
6. Have you sent gifts/remittances of grain to relatives or others outside Dankui during the past year? What grain, to whom (name and kin relation), where, when, how much, and why? Did the recipients request this grain or did you volunteer it? Do you know to what use they plan to put it? (Consumption, resale, other.)
7. Do you plan to send or have you sent any such gifts/remittances this year? Why or why not? If yes, to whom, how much, where, what, why, etc.?
8. During the past year, did you receive any such gifts or remittances of grain? Same questions as above. Did you request them?
9. Are you likely to receive further such gifts/remittances this year? From the same source(s), or from others? Describe. Will you request such assistance?
10. Did you pay out any grain in tribute or rent to the chief or other landowners last year? This year? To whom, how much, what grain, why, etc.?
11. Did you receive grain from anyone, in the same fashion? Last year? This year? Same questions as above.
12. Does anyone in your household make and sell prepared grain products? (Beer, doughnuts, cakes, porridge, millet water, other.) Who and what? How often and where do they sell? Is the grain taken from your/their stores or is it purchased? About what amount of which grains was utilized in this fashion last year? This year, will the person(s) continue to sell? What will be the source and quantity of the grain used?
13. How does your compound's grain consumption system work? Who eats with whom? Who does the preparing with what frequency? does this vary by season or household size? Do the preparers supplement these

allotments from their own stores? On a regular or on a seasonal basis?

#### STORAGE

1. May I see all your household's storage facilities? (List, describe the structure and its contents or, if empty, normal contents; indicate the controller of the contents.)
2. How does this year's storage compare with last year's with previous years'?
3. What is the oldest year of which grain you or anyone in your household currently has in storage?
4. Until when last year did you have grain carried over from the previous harvest? (Name the month.) Or, do you still have some of this grain? If so, how much? If not, is this the month when a year's harvest normally runs out? If not, why?
5. This year, how long do you think your grain will last? (Month.)
6. Seed grain -- do you generally furnish your own, or do you often buy or borrow seed grain? Which did you do last year? This year? Why?
7. How many failed fields of which grains did you have this year? Is this more than normal? How does it compare to last year?

#### LIVESTOCK

1. Which species of animals do you keep? (Cattle, sheep, goats, burros, pigs, chickens, guinea fowl, other.) (Get numbers if possible.)
2. Do you feed grain to your animals? Which grain(s) to which species? In what quantity and with what frequency by season? What quality of grain do you feed them? Do you ever purchase or barter for grain expressly for feed?
3. At what time of the year do you make most of your sales of which animals? Why then? What about purchases? Is there a "best time" for these? Why is it best?

#### GROUPEMENT VILLAGEOIS (GV)

1. You are/are not a member of the GV. Why have/haven't you joined? What is your opinion of the GV's usefulness or value?
2. Have you sold or bought grain to/from the GV during the past year? How much, what, when? Have you borrowed any money from the GV? What

were the terms and times of the loans? Have you purchased goods through the GV? What, when, payment schedule, etc.?

3. Has the GV caused any changes in your grain disposition patterns? Or in those of the village at large? What and why?

APPENDIX C  
SECOND INTENSIVE INTERVIEW

COTTON

1. Do you think raising cotton is more profitable than raising cereal for sale? If yes, why? If no, why? (In the case where an informant answers "no," but raises cotton nevertheless, be sure to get an especially complete explanation.)
2. What were your gross earnings from cotton this year?
3. What were your earnings after repayment of all fertilizer, insecticide, or other credits?
4. Compute the total cost of all other outlays that were used to produce your cotton crop this year; hired wage labor, plus work party expenses (total food purchases, livestock slaughtered, beverages, kola, etc.), plus oxen-and-plow rental, plus any other inputs.
5. Subtract (4) from (3). Do you still think cotton is profitable?
6. Aside from the quantity of cash it earns, are there other reasons why it is important to you to raise cotton? I.e., why do you raise cotton rather than some other crop (e.g. sesame, sorghum, peanuts) for sale?
7. If the field(s) you planted in cotton this year had instead been planted in sorghum, what might have been the yield of sorghum from that same land?
8. Which is more work to raise -- cotton or sorghum? Why/how is one more work than the other?
9. Do you feed cotton seed to your animals? If so, which animals?
10. How do you obtain the cotton seed -- e.g., buy it from ORD/SOFITEX, buy it from the Service d'Elevage, get it free from ORD/SOFITEX, buy it from another farmer. (In the latter case, how does he get it?)
11. At what time of the year do you begin to feed cotton seed to the animals? When do you stop doing so?
12. How many sacks of cotton seed per year do you generally use for animal feed?
13. Which of the crops you raise does most damage to the land?
14. How many sacks of which types of fertilizer did you use for each crop this year?

## GRAIN MARKETING

1. If you decide to sell some sorghum, where and how would you first try to sell it, and WHY: at the Tchiookui market, at some other market (specify name), at home, by going house to house, to a merchant or a merchant's agent (specify who), to the GV.

At harvest time -- a small quantity (up to 3 tines); a large quantity (more than 3 tines) during the planting season -- a small quantity (up to 3 tines); a large quantity (more than 3 tines).

2. If no market sales were named above, inquire further of the informant why he prefers (not) to sell in a market.
3. If you (were) going to sell cereal in a marketplace, which market would you choose and why?
4. Assuming that you are going to sell in this market, how would you decide upon the selling price for your grain?
5. Does the price of different grains at varying times of the year help you to decide when to sell which grain? Or do you just sell when you feel you must?
6. Do you find that the prices of grains at any given time of the year are the same in all the markets around here? Or are some grains cheaper in some markets at certain times? Which grains and which markets, when? Why do you suppose this is the case?
7. If you sell grain from your own home or by going house to house, how do you decide on a selling price?
8. If you sell to relatives/good friends/neighbors, do you generally give them the same price as strangers? If not, how and why are the prices different?
9. Are you obliged to sell grain to friends, neighbors, or relatives if they ask? Under what circumstances can you refuse to do so?
10. If you were going to sell grain to a merchant, to whom would you sell? Why him and not someone else?
11. In general, do you feel that when you or others sell to a merchant, you get a fair price for your grain? Or do you sometimes feel cheated? How might the trader cheat you? Describe a specific incident known to you, if possible.

12. Whenever you actually do sell grain in the market or to a merchant, do you measure the grain yourself beforehand? If so, how do you measure it? How does this correspond with the trader's measurements?
13. Is it always easy to sell as much grain as you want to? Or have there been times when you've had trouble finding a satisfactory buyer for your cereals? Describe the circumstances.
14. Do you think that most people in Dankui/Dar Es Salaam make advance grain sales to merchants most years? Or do only a few people or a certain category of people do so? Elaborate.
15. What -- in your opinion -- would cause a person to sell grain at harvest time, just when the prices are the lowest of the whole year?
16. Do you think that most people in Dankui/Dar Es Salaam make such harvest time sales most years? Or, again, do only a few people do so or only people in certain categories or circumstances?

#### MISCELLANEOUS

1. For what reasons do you and your family members sometimes shop in Ouarkoye? What sorts of things or services do you often purchase there?
2. About how often does someone of your compound make some purchase in Ouarkoye?
3. Does anyone from your family ever go to Ouarkoye to sell things? If so, who? And what does she/he sell? When or about how often does she/he market this item(s)?
4. How often do you or some member of your household go to the Koumana market? For what reasons do you/they generally go there?
5. If you have a Peuhl who herds for you, how (money, grain, animals), how often, and how much do you pay him?
6. How much grain of what type might your household give out per year in exchange for milk? Or do you pay for milk only with money?
7. How much grain of what type might you and your household members give out in payment for dolo drinking for a year?
8. For what reasons and at what time of the year might you sometimes buy grain even though you still have some grain in storage at home?

**APPENDIX D**  
**THIRD INTENSIVE INTERVIEW**

**GENERAL**

(For these questions, you need ask only three to five people who are knowledgeable on the subject.)

1. When the GV buys grain at harvest time, does it pay more than the market price or just the same price as in the market?

2.a. In normal years, where does the bulk of the grain bought by the GV come from -- e.g. advance sales by Dankui farmers, direct purchases by the GV in the market, farmers' harvest time sales of grain to the GV, etc.

2.b. Was this year different from "normal years" in the relative proportions of grain acquired from these sources?

3.a. At what time of the year are cotton prices usually announced?

3.b. Was this year any different in the timing of the announcement?

3.c. How does this compare with the five years past? I.e., was the price announcement consistently made at the same time of year?

4. At what time of year does SOFITEX usually arrive to buy the cotton (first, second, and third choices)? Was this year any different from past years in the buying time? (Again ask about the last five years, if possible.)

5. Why do many Mossi believe that field peas are the most destructive crop?

6. In a really good harvest year, when people sell grain from their homes, do they sell at the market price? Or do they give a lower price?

**FOR BWABA AND MOSSI SAMPLE MEMBERS**

1.a. How do you obtain the fertilizers and insecticides that you use on your cotton and other crops? Do you always buy on credit through the GV/ORD, or are these items also available in local stores and markets?

1.b. If so, have you ever bought fertilizer or insecticide from a store or market? Are they more expensive if bought in this way?

2. Was the amount of fertilizer you used for your crops last year about normal for you? Or did you use more/less than usual? For which crops and why?

3. For which crops do you employ insecticides?

4.a. What did you grow on this year's cotton field last year?

4.b. What crop will you plant on it next year?

4.c. Is the fact that the field was fertilized for the cotton crop important for the success of the next crop to be planted on that field the following year? I.e., if you were to leave off cotton production entirely, would that have any negative (or positive) effects upon your cereal production?

5. Many people have noted that a small cotton field may produce as well as a large one. Is this true? If so, in what way (quantity of cotton as versus quality) is this true? Please give a specific example in relative sizes (hectares) of fields, quality and quantity of yields, and of money earned therefrom.

6. We understand that during these past one or two years, you have made very few grain for milk or grain for dolo exchanges. But in a good harvest year -- say, like four or five years ago -- do you normally make such exchanges? If so, please give an estimate of the quantity and type of grain you might exchange for each of these items.

a. milk

b. dolo (for Bwaba only)

7. Please try to recall and enumerate your animal holdings as of December 1983.

## APPENDIX E

### THE WEALTH RANKINGS<sup>1</sup>

Silverman (1966) was the first researcher to suggest this global, emic ranking and grouping technique, which can be applied to any type of economic, social, or value-system variable. Although later much refined statistically, the technique itself is usually simple and straightforward. A number of native judges (normally three to six or so) who are highly knowledgeable in the area to be investigated are selected. They are presented with the units to be ranked -- typically written on small cards -- and asked to order them in accordance with their own criteria and categories. Upon completion of the task, they are then asked to explain the rationale behind their rankings.

In the present study, the variable to be investigated was wealth, and the units to be ranked were the Dankui sample compounds -- the basic unit of analysis for this report. Three judges (all nonsample members) were selected on the basis of their wide-ranging knowledge of the village and all its inhabitants, plus their personal acquaintance with the families in the sample. The relatively recent arrival of a number of the Mossi and Fulani research subjects limited the choice of judges to just a few men: the village chief, who is familiar with all families living under his authority; the head of the largest lineage of Dankui, on whose land the majority of Mossi immigrants reside; and a third man who is a close consultant of the village chief and a dynamic organizer of community events and opinion, and who frequently visits among all the wards.

Only this latter judge could read and write. Therefore, a modification of the usual card-sorting technique was necessary. In addition to the small cards giving the name of each compound head in the sample, a simple sketch map showing the compound's residence area was displayed to the illiterate judges as a mnemonic device. After the

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<sup>1</sup>My thanks to economist Gary Christiansen of ICRISAT and the World Bank for the wealth group computations. Also to Chuck May, CRED economist, for statistical assistance with the MPS data.

judges had ranked the 30 families<sup>2</sup> and classed them into wealth groups, they were asked to describe the bases for their rankings and groupings.

Interestingly, all three judges cited the same, tripartite rationale. They stated that their responses represented a global estimate of each compound's livestock holdings, its agricultural productivity, and its access to labor both internal and external to the unit itself. Moreover, the judges' assessments of these parameters were based upon a cross-time knowledge of the sample compounds rather than upon a single, possibly very atypical, year's resources and performance. This is one of the primary advantages to this ranking technique.

The three sets of rankings produced by the three judges were then aggregated to derive a mean relative rank for each of the 30 sample compounds. To assess the degree of interrater reliability, the coefficient of concordance  $W$  was computed (cf. Ferguson 1966:225 ff). For  $m = 3$  judges and  $N = 30$  items to be ranked and correcting for tied ranks,  $W = .97$  in this instance. A  $X^2$  test of  $W$ 's significance yields the figure 83.5, where  $X^2 \geq 49.6$  is significant at the .01% level with 29 df. The judges' rankings were in extraordinarily high agreement. The division into wealth groups was arrived at by collapsing the three judges' categories of four, five, and five classes respectively into four groups and assigning each compound to one of the four wealth groups on the basis of a two out of three or three out of three agreement across judges.

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<sup>2</sup>Curiously, in contrast with Andean informants to whom I have applied this same technique, the Dankui judges produced discrete compound by compound rankings. They perceived no two or more units as equally wealthy. Happily, this approach to the ranking task greatly facilitated statistical analysis.

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THE DYNAMICS OF GRAIN MARKETING  
IN BURKINA FASO

VOLUME III

RESEARCH REPORT 2

FARM LEVEL GRAIN SECURITY

IN BURKINA FASO

CHARLES A. MAY

Burkina Faso Grain Marketing Development Research Project

Prepared by  
Center for Research on Economic Development, University of Michigan  
and  
International Agricultural Programs, University of Wisconsin  
for  
United States Agency for International Development (USAID)  
Contract No. AFR-0243-C-00-2063-00

May 1987

FARM LEVEL CEREAL GRAIN SECURITY  
IN BURKINA FASO

by

Charles Alan May

A thesis submitted in partial fulfillment  
of the requirements for the degree of  
Master of Science  
(Natural Resources)  
in The University of Michigan  
1985

Thesis Committee:

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## LIST OF ACRONYMS

FAO	Food and Agriculture Organization (UN)
ICRISAT	International Crop Research Institute for the Semi-Arid Tropics
MRD	Ministry of Rural Development (Burkina Faso)
OFNACER	Cereal Grain Marketing Parastatal (Burkina Faso)
SAFGRAD	Semi-Arid Food Grain Research and Development
SOFITEX	Cotton Marketing and Production Monopoly (Burkina Faso)
UN	United Nations
USAID	United States Agency for International Development
WHO	World Health Organization (UN)

## CHAPTER 1

### INTRODUCTION

The last decade has seen an increase in research focusing on rural farming households and their economic environment in Burkina Faso (Sanhouidi, 1979; Saul, 1982; Ouedraogo, 1983; and Sherman, 1984). Each of these efforts approached the study of the rural farm economy by examining farm household behavior and the markets which confronted farmers. This monograph and the project from which it is derived are a continuation of this increased interest in small holder marketing strategies. Drawing on the insights from these earlier studies the Village Studies component of the Burkina Faso Grain Marketing Project focused its efforts on small holder farm household grain marketing.

The period of study, the 1983-84 agricultural year, proved to be a drought year for much of the African continent and in Burkina Faso. The data collected in such an environment are therefore unique in their applicability to farmer survival strategies in a food deficit year. This opens the way to an analysis of the public and private markets' abilities to respond to a stressful situation. Since the drought is not a one-year phenomenon, and in fact, may be a recurring problem throughout Africa, the information from this study is expected to have generalizable policy relevance, especially for those regions that are chronically deficit.

This report will present the information gathered during the study and resulting from a preliminary aggregate analysis of the dataset in the context of cereal grain security at the farm household level. The data are drawn from four villages in western and northwestern Burkina Faso. The sample set is comprised of over 140 farming households. The dataset consists of both survey and interview information with farmers and grain traders, collected over one agricultural year (December 1983-November 1984).

The goal of this monograph is to outline some of the cereal grain issues in Burkina Faso and to add to the ongoing debate of food security with empirical results from regional studies. It begins with a brief review of the food security debate with cereal grain security defined as

the major component of food security in Burkina Faso. The relevant cereal grain security actors in the Burkinabé environment at the institutional, farm and market level are presented and finally, areas for improvement of cereal grain security are offered.

This report reflects a first cut at analysis of the dataset. The state of the data, as of this writing in July 1985, allows only aggregate village level analysis to be performed. As such, any conclusions, although valid, may be subject to minor revision once the data is fully analyzed at aggregated and disaggregated levels.

## CHAPTER 2

### FOOD SECURITY VERSUS CEREAL GRAIN SECURITY

Food security has been a development 'buzzword' since the convening of the World Food Conference in Rome in 1974. Coined to draw attention to the then precarious world grain reserves, the drought in Africa and world population growth rates food security meant different things to different people. In this section we will choose an operational definition for cereal grain security and proceed to explain the reasons for that choice.

#### 2.1 DEFINING THE PROBLEM

The most useful definition of food security, for our purposes, is that put forward by Valdés and Siamwalla (1982:2). They define food security "as the ability of food deficit countries, or regions or households within these countries, to meet target consumption levels on a year-to-year basis." This definition, of course, begs the question of what is a 'target level' of consumption.. For Valdés and Siamwalla it is the trend level in national consumption statistics. Lele and Candler, in Valdés and Siamwalla (1981:107), point out the dubious nature of official statistics and the problem in interpreting variations from a 'trend' in estimates from different sources.

In Burkina Faso itself this debate is especially acute as there are three measures used to provide 'target levels' of cereal consumption by different institutions. The Food and Agriculture Organization (FAO) proposes 180 kilograms of cereal per person per year basing its figures on human caloric requirements. The United States Agency for International Development (USAID) maintains that the FAO figure is calculated for coarse grains only and does not include wheat and rice. Including wheat and rice as 6.6 percent of total consumption USAID arrives at a figure of 192 kilograms of cereal per person per year. The Ministry of Rural Development (MDR) of the Burkinabé Government uses 215 kilograms of cereal per person per year based on their own empirical studies but assuming that households make up caloric shortfalls from

human nutritional requirements only by cereal consumption. (For full presentation of this debate see Haggblade 1984:52).

The point made by Lele and Candler remains, and is well taken, that variance around a trend is a nonoperational measure when the variance in the "trend" value itself is highly variable. Rather than plunge head first into a national minimum cereal consumption requirements debate this monograph will examine farmer marketing strategies of where, when, and what farmers buy, and then try to explain why, leaving the how much question to the further analysis of the dataset.

Food security issues also have temporal and spatial dimensions that must be clearly defined to insure that the topic doesn't become too broad and encompass all aspects of food problems. Temporally the food security issue can be viewed from two perspectives, namely, short-term and long-term. The long-term goal is to be able to meet expected future needs given a growth rate of production and population for a give region or nation. The long-term goal is clearly out of the realm of discussion for a one-year marketing study and would be a topic better left to the long-term researchers of production systems in Burkina Faso.

In the short-term the goal is to meet 'target' needs on an annual basis whether they be for households, regions, or nations. This project was a one-year study and is, therefore, more amenable to short-term analysis. The question again arises as to which annual 'target' is to be used. This report will assume that households met their 'targets', whatever they may have been, and will instead analyze the manifestations of their strategies as revealed in their household marketing decisions.

Spatial limitations are of less concern to the Valdés and Siamwalla definition of food security as evidenced by the inclusion of "countries or regions or households" within their definition. This is due to the fact that security strategies that are followed at the household level have direct influence on regional and national security strategies and vice versa. In the case of long-term versus short-term temporal decisions the strategies may in fact be contrasting. An example would be that an increase in food aid imports, to meet a short-term reduction in production output, would not be considered a viable long-term solution to meet increasing demand.

The spatial concerns of this monograph are those of the Valdés and Siamwalla definition of food security; notably, countries, regions, and households. The data collected is most open to analysis at the household and regional level but does have national relevance as well. No discussion of international level food security issues will be included in this report.

The focus of this report will also be restricted to cereal grains as they were the mandate of the research project. They make up 75 percent of the caloric and 70 percent of the protein intake in the local diet (Haggblade 1984:10); and these are the results of a grain marketing study and not an overall consumption study. Food security would entail examination of all carbohydrates, fats, and proteins that entered into the local diet. The results from our research can add to the empirical database concerning one segment, albeit the largest, of the food security question in Burkina Faso. Thus, cereal grain security should be viewed as a component of food security and is necessary but not necessarily sufficient to ensure nutritional requirements to the population.

After all of the caveats listed above we remain with a working definition of cereal grain security for the purposes of this report that is short-term in outlook over households and regions with national implications.

## 2.2 CEREAL GRAIN INSECURITY

There are two major causes of cereal grain insecurity: (1) variability in production; and (2) variability in price. In Burkina Faso, as elsewhere, the variability in production is chiefly due to fluctuations in weather. Burkina Faso is marked by variable rainfall across space (between and even within regions) and time (principally years, but also timing of the rain that does fall) that makes for a very uncertain production from year to year, region to region. (See Matlon and Spencer 1984:671). This variability in production, of both cereal and cash crops, effects rural incomes as well as consumption because the major employment in the rural sector is agriculture. For a farm household variable production of cereal crops will reduce consumption of farm produced food in a bad year and increase dependence on the market.

If the cash crop also fails to produce in a bad year the income to make market purchases may be lacking and the farmer is hit with a 'double whammy.' This 'double whammy' at the household level, in a bad year, results in lower food production and also, lower incomes with which to purchase food in the market.

The second cause of food insecurity, namely price variability, also directly affects farm income. Food supplies may be available but at a price which the rural effective demand cannot reach due to low income. This is especially true of the poorest farm households who spend the largest proportion of their household budgets on food. In low production years the high price of food can cause the liquidation of household assets to meet consumption requirements.

It is clear that both causes of food insecurity affect rural incomes, as well as consumption. As farmers increase spending on food and reduce other spending the national economy will also be affected, via multipliers, due to decreased aggregate purchases. This income that is spent on food security is income deferred from development investments elsewhere. Thus food security is not only a consumption and income question but is also tied directly to other development opportunities.

### 2.3 MAJOR CEREAL GRAIN SECURITY ISSUES IN BURKINA FASO

There are three areas in which cereal grain security is a major issue in Burkina Faso. Not surprisingly they are directly tied to the causes of food instability listed above. Foremost is the need for the stabilization of the national supply of food. The main cause of the unstable food supply in Burkina Faso is the variable climatic conditions, primarily rainfall. Table 2.1, showing the estimates of the regional and national deficit or surplus situation, points out not only the chronically deficit nature of Burkina Faso's cereal production but the variability from year to year of the size of that deficit. There is no clear 'trend' to be found in these data, the conclusion being that the country is faced with a major problem due to the yearly variability in the production of cereal grains.

If the production estimates would net out to zero, or even if there were a net surplus, it would not necessarily mean that those households

TABLE 2.1  
ESTIMATES OF REGIONAL DEFICIT/SURPLUS SITUATION (TONS)

Year	Center	Center East	Center North	Center West	East	Hauts-Bassins	Yatenga	Sahel	Bougouriba	Volta Noire	Total
1971	-53461	-24313	- 8297	- 88551	-10626	-35209	-45544	-41323	23035	-14501	-298894
1972	-49944	-23320	-23221	- 77916	-11563	-43842	-42771	-47772	21974	-17546	-315924
1973	-60886	-28407	-28232	- 61304	-59413	-45281	-48834	-48579	-23995	-34185	-439116
1974	14156	-31876	-21929	- 18750	2334	- 4361	-25062	-30181	-28462	-39930	-184059
1975	-37705	- 3725	-14414	- 528	1585	- 9426	-20840	-30228	- 9299	58767	- 65811
1976	-59594	-26880	-41796	- 87275	4554	-37733	-49169	-33612	-15855	22157	-325204
1977	-44042	-24472	-26285	- 85215	9427	-32438	-44457	-43932	-14422	51007	-254831
1978	-64497	-27337	-29494	- 69715	3702	- 570	-42888	-26959	- 8847	21809	-244798
1979	-39630	-20177	-42232	- 79440	7271	-10868	-52281	-35294	- 5887	33952	-244590
1980	-66682	-15506	-67783	- 91407	-31803	-12637	-77563	-35777	- 2900	- 2220	-404281
1981	-34317	-17385	-22755	- 74032	-11406	- 6380	-54309	-17718	- 846	13661	-225491
1982	-45794	-32366	-61605	-100984	-12093	3634	-69321	-27903	- 1910	32973	-315371
1983	-67741	-11982	-65988	- 82419	-18081	-26530	-71557	-46315	-15961	8942	-397635

SOURCE: Ministry of Rural Development Statistical Bulletins.

NOTE: \*Calculated as Foodneeds (192 kg/person) less available production.

facing cereal grain insecurity would have adequate supplies available to them. The issue of distribution of production across time and space is also key to Burkina Faso's cereal grain security needs. Temporal concerns arise in both intra-annual and inter-annual distribution. Intra-annual so that adequate supplies would be available throughout the year, especially in the pre-harvest season, and inter-annual, so that possible surpluses from one year could be carried over to the next. This would reduce some of the risk inherent in the variable production from year to year.

The spatial dimension to the distribution issue is primarily one of moving cereal surpluses to the deficit regions. Again Table 2.1 points out the differences in production shortfalls across regions that make spatial distributions within the country a major issue. In order to capture information on the cereal flows between surplus and deficit areas the research methodology employed required two villages in each of these contrasting regions.

The final issue of critical importance to Burkina Faso in the realm of cereal grain security is the problem of effective demand. This can be viewed as adding a third dimension to the distribution issue with distribution across socioeconomic groups. For if the supply is stabilized, and the distribution of that supply is efficient, the price of the cereals must be within the income restrictions of the target population. If effective demand is low, due to low incomes, cereal grain insecurity is again caused by variation in price.

## CHAPTER 3

### VILLAGE STUDIES METHODOLOGY

#### 3.1 INTRODUCTION

The collaborative effort on the Burkina Faso Grain Marketing Project consisted of a trilateral research design of Market Studies, Urban Studies, and Village Studies. These three integrated parts of the overall project were designed and implemented by an interdisciplinary team of researchers. Given this interdisciplinary approach of the research effort, multiple research methodologies were employed to garner the necessary qualitative and quantitative data to identify smallholder farmer marketing strategies.

The major goal of the Village Studies component of the Burkina Faso Grain Marketing Project was to acquire a better understanding of the farm household economy with special attention paid to marketing activities, both buying and selling, of cereal grains. Pursuit of this goal involved a greater appreciation of farm level decision making with regard to marketing cereals and also the market conditions that the farmers faced.

Thus the basic objectives of the village studies were to determine:

- HOW farmers decide to dispose of or acquire their cereal foodgrains
- WHY farmers decide to dispose or acquire in that fashion
- WHAT are the market conditions confronting farmers

Through the village studies dataset the research team aspired to identify farmer strategies to sell, store, buy, consume, or otherwise dispose of or acquire cereal grains within the context of the entire farm household economy. Of primary importance is the determination of the variables that influence grain transactions at the producer level and once identified, the nature of those determinants. The third objective also concerns how farmer behavior, for both surplus and deficit producers affects the market.

This chapter outlines the research methodology employed by the Village Studies team to meet its multiple objectives. The mainstay of the research effort was the economic survey data based on a questionnaire

format. The data collection technique focused on economic transactions but was sensitized, with the help of the project anthropologist, to social transactions of obligations, reciprocity, and redistribution. More traditional economic information was gathered via price data on cereals in the village markets.

The bulk of the data collected is represented by the survey data and market price information. However, recognizing that a wealth of quantitative data without the qualitative insights with which to decipher them would not be insightful, more qualitative techniques were added to the overall research effort. These include intensive farmer and grain trader interviews, plus a sales preference study of farm assets using photographs. The combination of both qualitative and quantitative techniques allows greater sensitization of the analysis of the overall dataset with a heightened appreciation towards village realities. These efforts were supplemented by the standard methodologies employed for site and sample selection. The final section of this chapter offers suggestions for improving the research to future researchers.

## 3.2 SITE SELECTIONS

### 3.2.1 Regions

The mandate of the Grain Marketing Project required the examination of both cereal grain disposition and acquisition strategies of smallholder farmers. Working with the resource constraints of the project two regions of study were chosen, one in a surplus area (for following mostly disposition strategies) and the other in a deficit area (for following mostly acquisition strategies). These two regions were populated by different ethnic groups and existed in different agroclimatic zones with different major and minor crops. The existence of a major private grain trade between the two regions was also suspected because migrants were known to be moving from the chronically deficit north to the more fertile, less populated and better watered southwest of Burkina Faso. The surplus region of study was the former province of Volta Noire (presently Mou Houn, Sourou and Kossi Provinces) and the deficit region was the province of Yatenga.

An overall attempt was made to work in previously unstudied areas and villages in order to complement ongoing research by other researchers in different regions of the country. Due to this desire not to overlap with already completed, existing or planned studies a good deal of research effort was focused on collection of baseline descriptive data of the regions and the economies contained or interacting with them. Basic descriptive research was also necessary due to the limited amount of literature on grain marketing by smallholder farmers.

The actual process of selecting the regions for study was prefaced by research team visits to the areas, discussions with local officials (from the ORD, OFNACER, Mairie, etc.), and discussions with other research teams in Burkina Faso (ICRISAT, SAFGRAD, etc.). During this stage of the selection procedure no villages were selected, rather regions of study of most interest to grain marketing were targeted for extensive fact-finding visits by the research team. Once the regions of study were decided upon, more intensive visits were made in each region in preparation for village selection.

### 3.2.2 Villages

In selecting the villages to be studied within each region a variety of criteria were employed. Foremost was the need to have two villages within each region which would reflect different aspects of the regions themselves. The research team was particularly interested in having villages with different access to local markets. Including more than one village in a region was also seen as a way to provide ... area of wider applicability for any results emanating from the study. It also provided insights into any intra-agroclimatic zone variation, thus site dispersion within the agroclimatic zone was desired. The limit of two villages per region was also felt to be the maximum use of project resources. In the same regard no village was chosen that was over a one hour drive (one-way) from the respective regional capital. This was seen as expedient for minimizing researcher road-time as well as for logistical and safety reasons.

Of major concern was that the villages chosen not be located on main roads, especially paved roads, because any marketing information collected in a well-connected village would be extremely biased and not

widely applicable. The majority of villages in Burkina Faso are not located on paved roads. Not all major markets are located on good roads and villages were chosen across a spectrum of market sizes from important regional market villages to villages with no formal market at all.

In order to acquire this level of information on a village the researchers relied again on the local institutions to provide information and, at times, to provide guides. A principal resource in this regard was the ORD in each regional capital. Villages were chosen for site visits by the research team and additional 'field' information on each village was gathered from the rural ORD and government representatives in each sub-region.

Upon arrival in the village of choice an accompanying ORD or government representative introduced the research team to the chief of the village. The project was explained to the chief and often the assembled elders. Subjective impressions of the receptiveness of the chief and the elders to the study also entered into the final decision to work in any one village. Once the decision was made to work in any one village the relevant local authorities were informed of the exact locations in which we planned to work.

In the deficit Yatenga region the villages of choice were Mené and Bougouré. Mené has a major regional market, is 45 kilometers northeast of the regional capital, is mostly Mossi in ethnic mix and its main crop is pearl millet. Bougouré has a small market, is 35 kilometers southeast of the regional capital, is completely Mossi and its main crop is white sorghum. (See Chapter IV, Regional Descriptives for more information).

The search for village sites in the surplus region of the former Volta Noire yielded the two villages of Tissi and Dankui. Tissi has no market itself, is located 60 kilometers north of the regional capital, is mostly Dafing in ethnic mix and its main crops are the sorghums, both red and white. Dankui has a local bush market, but not in the geographic confines of the village itself, is located 54 kilometers south of the regional capital, is a mixture of the Bwaba, Mossi and Fulani ethnic groups and its main cereal crop is sorghum, but cotton is an important cash crop.

### 3.2.3 Markets

In preparing to study grain marketing in Burkina Faso the research team acknowledged the fact that farm households make their marketing decisions within the economic environment in which they find themselves. One cannot examine farm household marketing decision-making without also understanding the market conditions that confront farmers. To reflect this concern a small-scale, yet intensive, rather than extensive version of the market studies was instituted around each of the chosen village sites. These research efforts included price collection, interviews with grain traders, and thematic interviews with farmers.

For each of the four villages one to two markets were chosen based on the most frequently visited markets cited by farmers and appearing on the questionnaires. After one month in each village it was readily apparent, through general observation and interviews, which markets were frequented by the farmers in our sample. This subjective information was checked against the more objective data resulting from the sale and purchase location questions on the questionnaires.

In addition to these village level markets prices were collected and interviews conducted at the regional capital level. This was deemed important because the regional capitals were often the location of major markets, OFNACER warehouses and other grain market participants (ORD, PVO's, etc.). These regional capital markets, located in Ouahigouya (Yatenga) and Dédougou (former Volta Noire), ranged from a minimal grain market (Dédougou) to a major player in both regional and national cereal marketing (Ouahigouya).

In the deficit region of Yatenga the village of Mené is one of the largest cereal markets in the area. As such, it dominated the sample farmers' choice of which market to visit. It was the only market around the Mené site where price data was collected. Interviews were conducted in other surrounding markets that were mentioned by farmers. Around the second deficit region village of Bougouré two markets were selected for study, one at Ziga (7 kilometers west), and one at Douré (14 kilometers east). Price collection was begun at both sites but discontinued at the Douré site due to trader intransigence. Ziga is a larger village than

Bougouré and is the location of the sub-regional cereal bank. It is frequented mostly by small local traders.

In the surplus regions of the former Volta Noire one market was chosen around the village site of Tissi. Tissi itself, it will be recalled, has no market and as such villagers are obliged to travel elsewhere to meet their marketing needs. Gassan is 9 kilometers northeast and is located at a major intersection which offers a choice location for market activity. For Dankui, the other surplus village in the former Volta Noire two markets of study were chosen. Tchiookui, the 'suburb' market of Dankui, is a bush market and is located 12 kilometers northwest from the village center. Koumana, the second market chosen in the Dankui area, is a large market located far into the countryside some 35 kilometers southwest from Dankui that was frequented by local farmers.

### 3.3 SAMPLE SELECTION

#### 3.3.1 Farmers

Within each of the four original village sites a stratified random sample was chosen based on a village census performed by the research team. The stratifying factor employed in the sample selection process was ethnicity. It was matched to the population percentages of the various ethnic groups in each village. The sample element was the compound and thus, when a compound was chosen all the households within that compound were retained in the sample. This process was continued until a total of approximately 45 households were selected in each village.

In order to implement the sample selection process a general village meeting was called through the auspices of the village chief. The research team used this meeting to explain the nature of the study and to introduce the field personnel to the assembled villagers. The village census was then taken over the course of 2 to 3 days. The data were assembled by compound, with each compound comprised of its constituent households. The random sample was chosen and the subsequent sample members were notified via the village elders. Any household that was chosen which did not wish to participate was allowed to withdraw. There were no more than two such households in any one village.

A comment is in order at this juncture on the nature of the Burkinabé farming household. It should be thought of as a dynamic and not static entity with its size, composition and even independent status changing over time and circumstances. In the study, shortly after the original sample households were selected, each household was judged separately as being either an independent decision-making unit or dependent on another household, usually within the same compound. Additional compounds and their respective households were then selected to bring the sample size in each village to approximately 45 decision-making units. The basis for distinction of independent from dependent households were independent storage and fields, consumption patterns, physical proximity and labor allocation. No set combination of these criteria were used in judging independent status and each household was judged separately.

Additional households of notable individuals were added to the sample in the two Yatenga villages. This was deemed advantageous in order to assure villager participation and good will. It also provided an additional point of analysis with regard to the overall economic influence such social notables hold within each village. Those notables included were: the chief, the earth priest, the president of the village cooperative societies, the Imam, and the chief of the smiths.

### 3.3.2 Traders

The cereal traders at both the village and regional capital levels were chosen in a more subjective manner. Initial contacts were made in the village usually by introductions from a third party. Due to the previous changes in government cereal grain policy the traders were more wary than the farmers in talking with our field research team. But once the confidence of one trader was gained the team would ask him or her to introduce them to another trader. The Mené village sample also contained one village level cereal trader who proved to be advantageous in making further contacts. At other times and in non-sample villages the team would look at who was trading in cereals and introduce themselves. At the regional capital level it was necessary to make appointments with traders not only due to their tight and busy schedules, but also to be able to have some privacy in the interview process.

### 3.4 DATA COLLECTION

#### 3.4.1 Survey Data

The economic survey questionnaires were administered once every two weeks to all sample households within each of the four original villages. Their main purpose was to monitor both economic inflows and outflows of the family farming unit. Five questionnaires based on consumption, sales, purchases, amounts given and amounts received made up the basic biweekly interview in an effort to capture both goods and services as they passed through the household (Figure 3.1).

The basic five biweekly questionnaires were supplemented on a quarterly basis by the administration of livestock and on-farm storage censuses. Baseline information on demographic variables within the family, field measures, and durable goods was also collected once, at the beginning of the study. Harvest data was collected for both the 1983 and 1984 agricultural years.

In addition to the biweekly and one-time questionnaires two special questionnaires were introduced. The first gathered information on changes in household composition over time and the second collected data to convert the local measuring units to their kilogram equivalents. Due to the dynamic nature of the household farming unit, outlined above, the household composition was monitored monthly to acquire data on size and composition changes over the course of the year. At the end of each month the members of the household who had been present for two weeks or more in the month were noted.

Many households were found to change their size over the course of the year which could greatly distort the production and consumption equivalents employed in the analysis. The monthly check on household composition allowed the research team to monitor household immigration and emigration, deaths, births, and visitors.

Local measuring units were weighed, for each household farming unit where possible, in order to establish kilogram conversions for both threshed and unthreshed cereals. It was necessary to have individual household conversion figures due to the large variation in size of similar measuring implements, both across and within villages. The

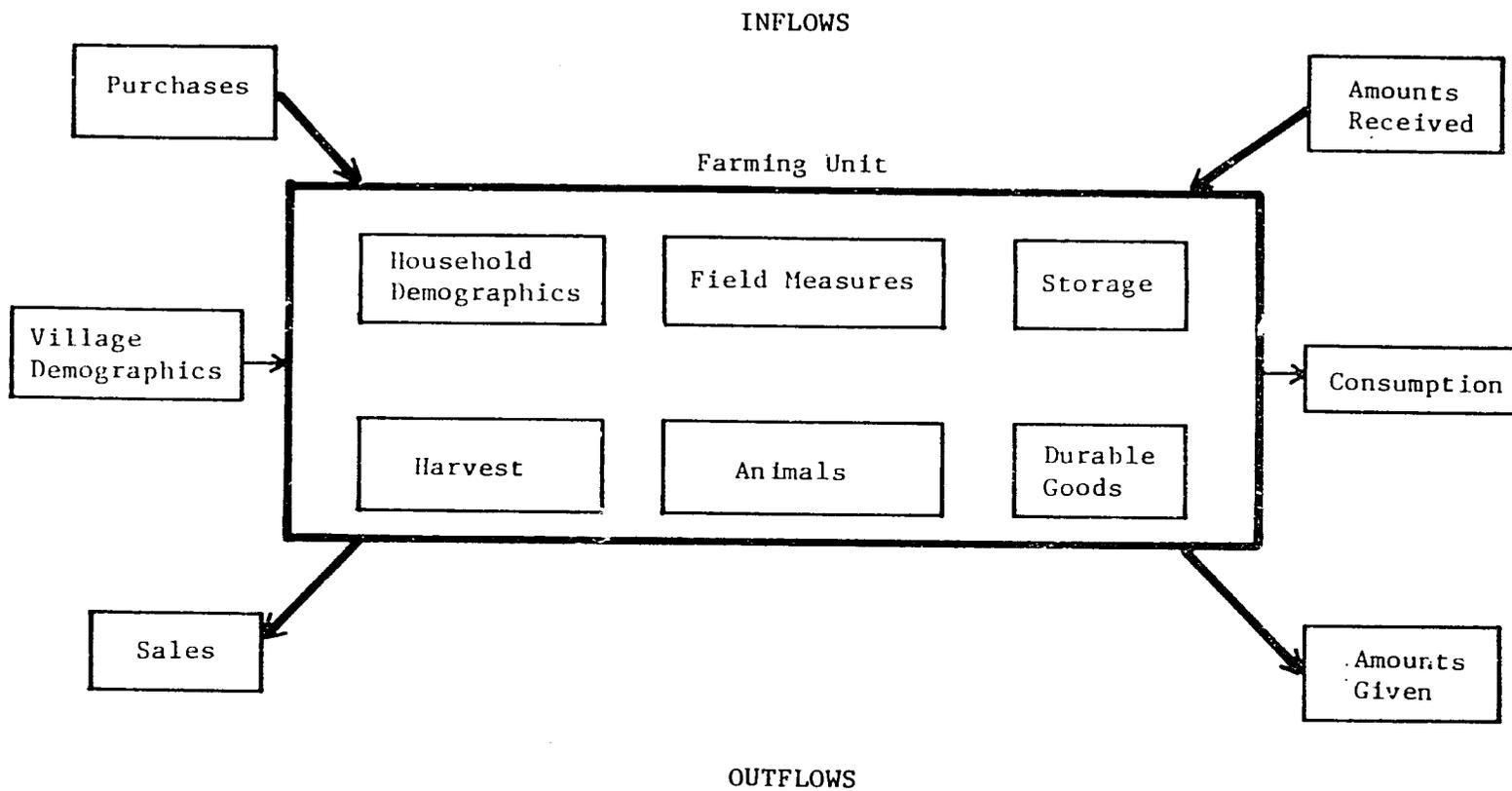


FIGURE 3.1  
 FLOW DIAGRAM OUTLINING QUESTIONNAIRE INTERACTION

University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.

collection of such data proved less problematic when the team provided the threshed cereal for weighing because not all households kept an on-farm storage of all the threshed cereals. For the ratio of threshed to unthreshed cereals farmers with unthreshed cereals in stock were asked to remove their standard household measure and thresh the contents. Weights were taken before and after threshing to obtain the cereal threshing ratio for as many households as possible. These threshing ratios were averaged on a village basis. In all, a total of 13 survey questionnaires summarized in Table 3.1, were administered during the course of the fieldwork where data collection began in December 1983 and ran until December 1984.

Among the various members in each household those interviewed for the biweekly questionnaires were the head of the household, his wives, any other married or mature (20 years of age or older) males, married females of any age, widows and widowers. It was felt that these types of individuals represented the major market participants within the household. Each household was scheduled to be interviewed on a particular day with approximately 4 to 5 families interviewed per day. The best time to interview was early morning, late afternoon or around noon time as farmers are generally busy during the other times of the day.

The interviews themselves were performed by a Burkinabé interviewer stationed in each of the villages. As the agricultural season approached an assistant was added to each village because the farmers are harder to find during this time and the demands of the survey instruments were at their highest. A conscious effort was made to acquire female interviewers but no suitable applicants were available. However, one female assistant was employed and the subsequent information obtained from the female sample members also improved. All of the other interviewers and assistants were young males, 20-25 years of age, with between primary and secondary school education. In addition, college-educated supervisors were stationed in the regional capitals to oversee the data collection in the researcher's absence, fill-in for any interviewers that fell ill, and assist in the collection of market information and informal interviews.

TABLE 3.1  
SUMMARY OF THE QUESTIONNAIRES EMPLOYED

Questionnaire Number	Questionnaire Name	Main Purpose	Frequency of Administration
0	Village Census	Establish village demographics for sample selection	Once
1	Household Census	Sample household demographics: sex, age, ethnicity, etc.	Once
2	Field Measures	Area cultivated to each crop or crop mix	Once
3	On-Farm Storage	Quantity of foodstuffs stored over time	Quarterly
4	Harvest	Quantity of harvest	Yearly
5	Consumption	Quantity & source of foodstuffs consumed	Biweekly
6	Sales	Quantity, value, type of good, reason & location of sales	Biweekly
7	Purchases	Quantity, value, type of good, reason & location of sales	Biweekly
8	Amounts Given	Services, salaries, credit, gifts, and remittances given	Biweekly
9	Amounts Received	Services, salaries, credit, gifts, and remittances given	Biweekly
10	Change in Household Composition	Monitor household compositional changes	Monthly
11	Durable Goods	Wealth and asset measure	Once
12	Measuring Units	Convert local measures to kilograms	Once
13	Animal Census	Type, number, and owner of livestock	Quarterly

University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.

### 3.4.2 Price Data

Biweekly price data for the major cereal grains were collected in each of the village markets that were outlined in the markets section of site selections above. Because of the variation in measuring units used within and between markets, prices and weights were taken over time. The cereals chosen for price data collection in each region were dependent upon the crop mix of that region.

The units of measure recorded were also regionally specific. Both purchase and sale price per weight combinations were desired so that trader profit margins could be examined. A direct approach to this type of data collection was not always feasible as some traders were suspicious of our intentions. In those areas where trader acceptance of our study was low a third party, usually a villager and not the interviewer, was used to make cereal purchases and sales. In either case the cereal that was bought on one market day was stored and resold on the following market day. Because the net of sale and purchase weights was not zero this stock usually had to be supplemented by additional purchases. With those traders who were more accepting of our study, direct farmer to trader, and vice versa, transactions were recorded. Thus, the year-long presence of the village studies in the various regions afforded the possibility of collecting a small time-series dataset on local cereal prices and weights in the markets affecting the sample farmers.

### 3.4.3 Informal Interviews

As discussed in the introduction to this chapter it was the intention of the research team to complement the quantitative survey and price data with qualitative insights through farmer and trader interviews. These interviews lasting from one and one half to two hours were guided by the data garnered from the economic questionnaires but were generally of a more open-ended nature. An attempt was made to touch on various thematic issues pertinent to the research but, as much as possible, the farmer or trader was left to talk about his or her own perception of the cereal grain market. Other market participants (OFNACER agents, cereal bank officials, etc.) were also interviewed.

The general purpose of the informal interviews was to give the researcher more information about individual farmer and trader circumstances. Through these interviews, the researcher would have greater insight into the interpretation of the numeric dataset (identification of outliers, traders in the sample, pensioners, etc.). The interviews, particularly with traders, were patterned after the market studies methodology but were employed on a smaller scale. This micro-oriented version of the market studies methodology, plus the more permanent nature of the village studies, allowed for a more intensive, rather than extensive, examination of local markets. Moreover, the utilization of a similar methodology accorded facile integration of village studies information with that of the market studies.

As the fieldwork proceeded it became apparent that in both surplus and deficit regions it was imperative to understand the nature and strategies of farm household income generation. In the deficit areas it was important to understand how farming households acquired the funds to buy the needed cereals. In the surplus areas the research team was interested in determining the role of cereal sales among all the possible household income generating activities. In collaboration with, and building upon, the work of the project anthropologist, a data collection technique using Polaroid photographs of farm household assets was designed. The immediate precursor of this technique was the anthropologist's own Marketing Preference Scale (MPS) as administered in Dankui.

With the institution of some modifications in the administration of this data collection instrument, and retention of the basic structural format, the MPS technique evolved into a methodology more suited to the economic demands of the research effort. The important structural changes were the addition of a photo denoting labor as a source of income generation and having the farmer first remove from his or her possibilities (i.e., photographs) any asset which he or she did not possess. Renamed the Sales Preference for Income Generation (SPIG) Survey, to distinguish it from the economist's more frequent use of the acronym MPS (i.e., Marginal Propensity to Save), and to describe its new-found use, this data collection instrument was administered in all four village sites.

The series of photographs of farm household assets included durable goods, agricultural produce, labor, loans, and remittances. These photographs, numbering around twenty, were easily adapted to reflect the particular village environment that may have influenced the income-generating possibilities available. The farmer was presented with the photos and asked to order them in preference of 'sale' to meet cash needs. Although certain limitations of the analysis of data collected in this manner are readily apparent (e.g., no possibility for temporal differences in sales preference if the survey is only administered once) the methodology does enhance the qualitative commentary offered by the farmer.

### 3.5 SUGGESTIONS FOR FUTURE METHODOLOGIES

Hindsight is always perfect vision and in the case of a research methodology allows us to reflect on what was useful and what could use modification in the research design. In this final section we hope to bring up some suggestions, that result from our experience, for any future researchers designing a similar research effort.

In the area of site selection the villages chosen for study can be too remote and inaccessible. When this is the case the research team can spend more time on the road than in the village itself. There is also the fatigue that results from extended travel, especially over unpaved roads, that reduces researcher efficiency and alertness in the field. In this respect the villages of study should not be more than 45 minutes travel (one-way) from the researcher's central location, in our case the regional capitals. This is not an argument for researchers to stay in the national capital and study only those villages within a 45 minute radius, but rather an argument for placing researchers in regional capitals and establishing a base of operations there.

At the village level itself a similar concern about the wastefulness of resources (researcher time, energy, gasoline, etc.) could be addressed by building a modest research domicile in or on the outskirts of the village for overnight and multiple day visits to the research sites. It is more efficient and productive, from both a research and economic basis, to stay in the village for longer periods than to commute. A good

program could be two weeks out in the field collecting data and two weeks at base analyzing, reflecting, and possibly redesigning existing research instruments or developing new methodologies. At the end of the study the structure could be turned over to the village, as an expression of gratitude for the villagers' support, to be used as they saw fit (e.g., meeting place, dispensary, cereal bank, etc.). Of course, the location and type of structure constructed would have to include villager input at the beginning of the selection process.

For the interviewers living in the village full-time the workload always seems to increase over time as the researcher adds more and more data requirements. One should always, in such a situation, stress quality and not quantity of information to be gathered. The only policy recommendations that result from mountains of low-quality data are low-quality policy recommendations, if not outright wrong ones. Therefore, a field interviewer should have no more than five families to interview in any one day with two days per week to make-up interviews missed due to farmer absence, illness or other unforeseen problems. These two make-up days could also be used for special projects such as market data collection, special questionnaires, and other village market visitations. This type of schedule for the field personnel would result in 20 families per interviewer per week. This results in four days of formal interviews, two days of special projects, and one day off. The field personnel would get only one day off as their daily schedules would rarely be a full eight-hour day due to farmer inavailability at certain times of the day. The make-up days should be staggered between the four days of formal interviews (i.e., two days of formal interviews, one make-up day, followed by two days of formal interviews and another day for make-up).

With one interviewer collecting data on twenty families per week, forty families could be interviewed if the data were collected on a biweekly basis. If a weekly format were followed a second interviewer would be required to obtain a forty-member sample. One female and one male interviewer would be the ideal combination, particularly in more traditional societies where females have restricted contact with males outside the family. Our experience with female interviewers was that they elicited more data, in both quantity and quality, from the female

sample members. This would also address the problem of most economic survey work of underreporting the 'female' economy in developing countries. A possible solution could be the interviewing of female sample members by the female interviewer. With this type of division of labor the families interviewed per day could be increased.

In addition to sensitizing the research methodology to the local roles of each sex it would be a marked improvement to mesh the timing of the research to the local unit of time measure. In most traditional rural societies it is the period between market days and not the seven-day week that provides the people with their temporal reference. Matching the frequency of administration of the questionnaires with an integer multiple of the local market cycle would improve participant recall and integrate the research into the rural routine for greater acceptance. In the Mossi areas of study (i.e., Mené and Bougouré) a three-day market cycle is the norm and in any one week two or three market days might occur. In such an environment of continually changing recall opportunities some aggregations and data were probably misreported.

Continuing the example within the Mossi areas, an integrated research design would work with two days of interviews, followed by research in the market on market day, then two more days of interviews, followed by a day off. This type of approach to data collection would coincide with the local market cycle. Each family would be informed that the interview would occur once every six days and two market opportunities would have passed since the last interview. Similar patterns for scheduling the research interviews around differing market cycles can be constructed if one does not restrict one's thinking to seven-day units of measuring time. Such integration with the local market cycle has the added benefit of increasing farmer availability. We found the hardest day to find farmers was the day of the most frequented local market. In this integrated design no formal farmer interviews are ever scheduled on market day.

Another method of increasing both the quality and quantity of data collected is to disaggregate the questions to be asked. Disaggregation refers to breaking-up general questions into a series of specific questions. For example, rather than asking if a participant in the study bought any cereals since the last interview ask the question for each of

the major individual cereal grains. A similar strategy can be employed with other major question categories such as animals, farm inputs, consumables, durable goods, etc. Such a list of disaggregated question cues should be listed directly on the field questionnaire to aid the interviewer's memory and insure that he or she asks the same questions of all sample members.

Finally, two items that could have made this research effort more efficacious: The methodology, once employed, proved to be weak in capturing farm household income. Although the 'sales' and 'amounts received' questionnaires were supposed to provide that information in theory, in practice full income data was not captured. The problem arose from farmer perception of what was a sale and what was an amount received. There was such a wide variety of income-generating possibilities that some did not seem to fit within our two question categories. Perhaps either a quantitative version of the SPIG methodology, or greater disaggregation of the 'inflow' questionnaires could remedy this fault. The SPIG survey could also be improved by applying it to the sample at three or four different times throughout the year to identify any temporal changes in sales preferences.

The other area of major concern is the measuring units used to arrive at kilogram equivalents of local measures. As was pointed out above individual household conversions were preferred due to the variability of measuring units across families and villages. However, this became an enormous task due to the plethora of units employed by villagers. Other problems encountered were that not all households had sufficient quantities of threshed and unthreshed grain to measure, some households were reluctant due to the possibility of losses while measuring, and some measuring units had been either lost or destroyed during the course of the year. All of these problems could be solved if a study standard unit for threshed and unthreshed cereals were issued to each sample household with replacements held in reserve. Participants would be given these units to keep and be asked to report all cereal transactions in terms of these units. Of course, they would have to be issued before the harvest and probably multiple copies of both the threshed and unthreshed units would have to be given to each household (possibly one each for each interviewee). For example, in our study the ubiquitous plastic or metal

bowl would be useful as a threshed measure and the locally constructed baskets as the unthreshed measure. Such an attempt at standardizing participant households with gifts of measuring units could be construed as a bonus to those families participating in the study. If some households continued to use their old measures they could be asked to determine the equivalent of their measures to those issued. The issued measuring units should not be the government official units due to the bias this might introduce in the transaction's data collected. If the sample villages became known as villages where everyone had access to government standardized units some traders might be less likely to transact business there. Such a village with perfect information and access to government standardized measuring units would not reflect the present market environment in Burkinabé villages.

## CHAPTER 4

### REGIONAL DESCRIPTIVES

As described earlier the research mandate was to study villages in both surplus and deficit regions. The north-central province of Yatenga was selected as the deficit area of interest to the project and the provincial capital Ouahigouya was taken as its base of operations.

The western provinces of Sourou and Mou Houn (formerly part of the Volta Noire province) were chosen as surplus regions of study with the research base of operations in the provincial capital of Dédougou.

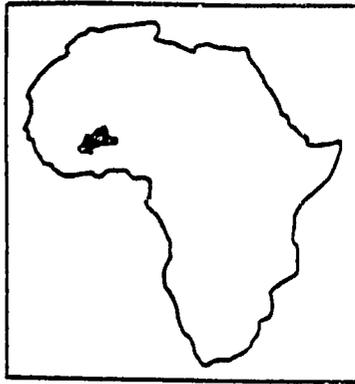
#### 4.1 YATENGA PROVINCE

The nature of a deficit region in a predominantly subsistence agricultural system is that the farmer cannot produce sufficient foodstuffs for his home consumption needs and therefore must have a strategy to make up that deficit. The determinant variables within a region causing it to be a net importer of foodstuffs are many and in the case of Yatenga principally agroclimatic. In this section the regional characteristics that result in the Yatenga being a chronic deficit area and brief rubrics on the two villages chosen for study are presented.

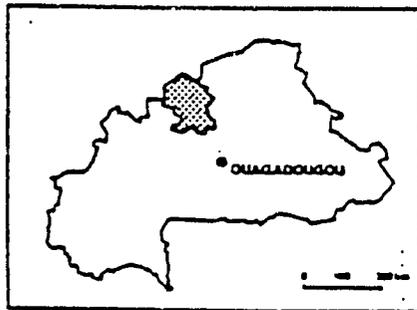
The Yatenga province of Burkina Faso is located between 13 and 14 degrees north latitude and comprises 12,297 square kilometers. Its elevation ranges between two to three thousand feet above sea level and its ranging scrubland is punctuated only with low hills. The province was formerly divided into the six subprovinces of Ouahigouya, Gourcy, Séguénéga, Titao, Thiou, and Koumbri. With the revolution of August 4, 1983, these six subprovinces were further divided, in an effort towards decentralization, into a total of fifteen subprovinces. The two Yatenga village sites are located in the former subprovinces of Ouahigouya and Koumbri. (See Map 4.1).

Population estimates vary according to the source and are constantly influenced by both immigration and emigration but the Ouahigouya ORD utilizes a population of approximately 608,000 inhabitants in 1983-84. This yields a population density of approximately 49 inhabitants per

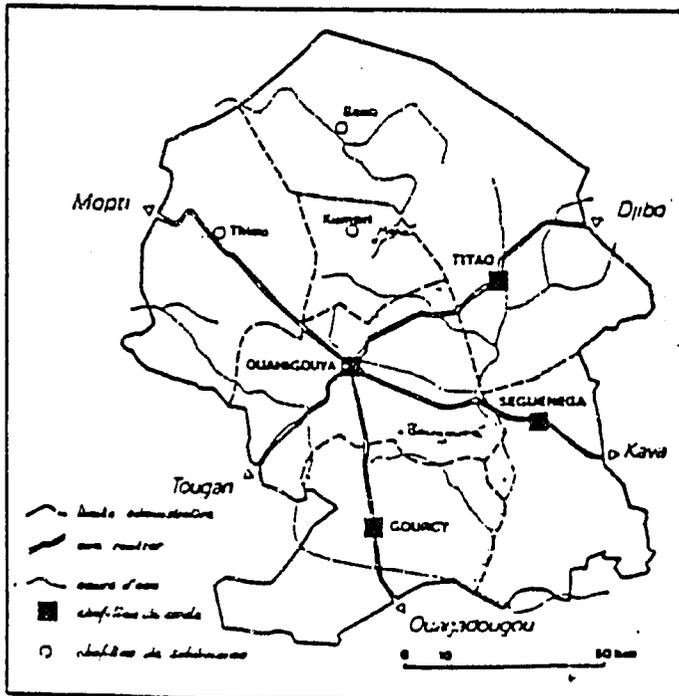
MAP 4.1 LOCATION OF VILLAGES SURVEYED (YATENGA)



*la Haute-Volta en Afrique*



*le Yatenga en Haute-Volta*



*Ouahigouya  
au Yatenga*

square kilometer as compared to the national population density of 24 inhabitants per square kilometer. The ORD figures indicate that this population is distributed over six hundred villages throughout the province.

The soils are generally poor throughout the Yatenga. They are characterized by a low humus content, and thus are lacking in organic material and are poor in water retention. Erosion is a major problem in all areas of the Yatenga. These soils are further degraded due to the overworking they endure because of the high population density in the region.

The rainfall in the Yatenga varies from 500 to 800 millimeters (mm) per year and falls in the rainy season that begins in May and continues into October. The overriding characteristic of the rainfall, however, is the highly localized nature of the rain that does fall. It is not uncommon for one area of a village to have several millimeters while five kilometers away, no rain will have fallen. These highly localized and irregular rainstorms create an environment of uncertainty for the small farmer. The rainfall pattern is further marked by the fact that the actual number of days of rainfall are few. For example, the average rainfall for the Yatenga ORD in 1981-82 was 602mm in 48 days while that of 1982-83 was 412mm in 35 days. The Yatenga region also is characterized by the appearance of periodic droughts that are apparent throughout Sahelian West Africa. The region is presently suffering through just such a drought.

The major farming activities in such an unfavorable and capricious agroclimatic zone are millet and sorghum cultivation with extensive livestock raising. Millet and sorghum are favored because they do not require rich soils or high rainfall, they can enter into short dormancy periods between periods of irregular rainfall, have a short growing season to match a short rainfall season and also withstand high temperatures. Livestock are important due to their mobility which can take advantage of the dispersed rainfall and its effect on pasturage production. There is also no evidence of tsetse fly infestation that could induce animal trypanosomes.

Within this context of agroclimatic uncertainty, Ouahigouya acts as a major hub of commercial, social, and economic activity. Established in

approximately 1780 by Naba Kango, the 26th sovereign of Yatenga, Ouahigouya had a population in excess of 30,000 inhabitants in 1984 making it the 4th largest town in Burkina Faso. All major flows of goods and services in the region pass through Ouahigouya and this is especially true of the cereals trade. In spite of the high population density in the province and the importance of trade in Ouahigouya, the Yatenga contains no paved roads and only a few improved or graded roads. The ethnic mix of Ouahigouya accurately reflects that of the province as a whole with Mossi, Fulani, Samo, Yarcé and Fulsé, the major groups represented. By far the major ethnic group is the Mossi whose language Moré is spoken throughout the province.

The cumulative result of poor soils and rainfall, aggravated by the high population density makes the Yatenga a chronically deficit region of Burkina Faso. Cereal imports into the Yatenga from the Volta Noire region and neighboring Mali were noted by French colonial administrators as early as 1926. This agroclimatic uncertainty of the Yatenga region has led farmers to attempt to mitigate the vicissitudes of their environment through their agricultural and marketing strategies.

#### 4.1.1 Mené-Koumbri Subprovince

Located 45 kilometers northeast of Ouahigouya, Mené is the northernmost of the five CRED village sites. Its overall population is approximately 2200, of which one-third are of the Fulsé ethnic group and the remainder are Mossi. Almost all inhabitants are Moslem and a striking mosque was constructed by the villagers. The village is serviced by two types of cereal banks, and an ORD extension agent has been located there for eleven years.

The major crop is millet as the rainfall is minimal in the northernmost sector of Yatenga, and the sandy soils are preferred by millet. Mené is a major village market that is active every third day in the traditional Mossi fashion. There are many small surrounding villages whose inhabitants regularly visit the Mené market. The market was established in the early 1940s after requesting permission from the colonial administrator. Two indigenous local traders are the major actors in the Ouahigouya market and commute regularly between Ouahigouya and Mené. There is local transportation between Ouahigouya and Mené on market days.

In years of good rainfall, local farmers may sell small quantities of cereals but they generally prefer to store their cereals long-term if their circumstances permit. Mené is known in the region as a 'cereals' market, as opposed to neighboring Youba which is the 'livestock' market. Long-term storage by farmers, although their stated disposition of preference, is not common among most farmers. It is definitely a sign of wealth, as is cattle, and is also a security stock against future poor harvest or drought. For those farmers who do not harvest sufficient cereals to meet their needs, the liquidation of livestock holdings provides the major income for cereal purchases. In bad harvest years such as that of 1983-84, external donor food aid plays an integral part in relieving the pressure on farm household budgets.

#### 4.1.2 Bougouré-Oulé Subprovince

Bougouré is located 34 kilometers southeast of Ouahigouya and is composed entirely of Mossi inhabitants. The population is approximately 1500 and the predominant religious beliefs are traditional. The village has no cereal bank with the closest bank located seven kilometers away in Ziga. The ORD agricultural extension agent responsible for Bougouré is also situated in Ziga.

White sorghum is the preferred cereal of cultivation although a fair amount of millet is also found. The market is held every three days but is not nearly as large or important as that of Mené. There are no regular traders based in Bougouré. The major market actors are the farmers themselves, their wives, petty traders from neighboring villages, or itinerant small traders. Bougouré market has not been visited by regular traders in over three years and there is no local transportation available on market days.

Farmer household economic strategies in Bougouré are quite similar to those of Mené with long-term storage preferred and liquidation of livestock as the major income-generating activity. A major difference noted in Bougouré is that the villagers will bicycle the 34 kilometers to Ouahigouya to purchase cereals either in the market or at the OFNACER sales office. There is no market southeast of Ouahigouya in the Oulé Subprovince where a farmer can go and be certain to obtain the cereals he needs. The distance to travel will also influence the difference in

marketing strategies. There are times in the year when certain local markets will have no cereal grain available, and the farmer must travel farther and invest more time in search of the cereals he needs for home consumption.

#### 4.2 SOUROU AND MOU HOUN PROVINCES (PART OF THE FORMER VOLTA NOIRE)

The former Volta Noire province was subdivided after the August 1983 Revolution into three provinces titled Mou Houn, Sourou, and Kossi. The surplus village sites, having been chosen before this subdivision of political regions, were thus part of different administrative regions. The data collected were not effected in any way by these new political regions as the implementation of the new administrations had not been completed at the conclusion of the study. The two villages, Tissi and Dankui, are now located in the provinces of Sourou and Mou Houn, respectively. No study village was located in the third new province, Kossi, resulting from the division of the former Volta Noire (See Map 4.2).

The former Volta Noire's (we will continue to refer to the region of study as the former Volta Noire because there are no disaggregated data available at the new provincial levels) major geographical feature is the presence of the only river in Burkina Faso, the Volta Noire, that flows year-round. This river makes a large loop through the region and is joined by the Sourou River at its apex just north of the provincial capital Dédougou. The fertile river valleys had been uninhabitable due to the presence of onchocerciasis, commonly known as river blindness. A program of continued sprayings for the flies that carry the disease by the World Health Organization (WHO) has opened some of these areas to continued human habitation.

In addition to the relatively abundant water resources of the region the soils of the Volta Noire are considerable more fertile than those in the Yatenga. This is reflected in the higher yields per hectare for most crops in the Volta Noire and the greater diversity of crops grown. The major portion of the region is classified as a Sudanic agroclimatic zone.

The former Volta Noire is also the recipient of higher rainfall per year on the order of 600-1000mm. The richer soils aid in retention of

MAP 4.2 LOCATION OF VILLAGES SURVEYED (FORMER VOLTA NOIRE)



University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.

the rainfall and numerous humid lowlands are created that are favorable to rice and maize cultivation. The rainfall in the former Volta Noire is also highly localized, however, and neighboring villages could have very different rainfall totals, as in the Yatenga and throughout Burkina Faso.

The former political administration of the Volta Noire was divided into six subprovinces. These six subprovinces were Boromo, Dédougou, Solenzo, Koungny, Nouna, and Tougan. The present number of subprovinces contained within the former Volta Noire are spread across the three new provinces (Sourou, Mou Houn, and Kossi). The total population of the former Volta Noire was estimated at approximately 730,000 in 1983-84.

The major food crops produced in the region are the sorghums, both red and white, and as previously mentioned, maize. Millet is also grown but not in large quantities because of the nature of the soils and the quantity of rain. Millet prefers sandy soils and does not tolerate excessive water. Cash crops, mainly cotton and peanuts, are a major source of revenue for Volta Noire farmers. Other cash crops include sesame and shea nuts. Cotton is more prevalent in the southern Volta Noire while peanuts are more popular in the northern portion of the region. In both food and cash crops the Volta Noire is a major supplier of agricultural products in the country. Attesting to the importance of the former Volta Noire to agricultural production is the fact that it is the focus of SOFITEX and OFNACER collection activities. SOFITEX is a partially state owned vertically integrated monopoly company dealing in cotton production, collection, and marketing. OFNACER is the parastatal in charge of grain marketing in Burkina Faso. OFNACER is generally acknowledged to control only 20 percent of the overall grain market in Burkina Faso.

The provincial capital of the region is Dédougou which is located 400 kilometers west of Ouagadougou, 180 kilometers north of Bobo-Dioulasso, and 210 kilometers southwest of Ouahigouya. When one regards a map of Burkina Faso, Dédougou appears to be located in a choice location right in the middle of one of the richest agricultural zones in the country. It is also practically centered between other major commercial cities in Burkina Faso. However, Dédougou itself is a small town with a modest market. This can be attributed to the fact that most collection and bulking of agricultural commodities is done in the rural areas and then is promptly transported to either Bobo-Dioulasso or Ouahigouya without

necessarily stopping in Dédougou. There is, however, a major OFNACER warehouse on the outskirts of Dédougou and a sales office next to the Dédougou market. Part of Dédougou's isolation can also be attributed to the fact that there are no paved roads in the region although the existing roads are graded with some regularity. The Bobo-Dioulasso to Dédougou direct route is particularly bad.

The ethnic make-up of the former Volta Noire is diverse with primarily Dafing and Samo groups in the northern part of the region and Bobo in the south. There are two ethnicities that are often confused when using the name Bobo, there are the Bobo-Oulé who speak a Voltaic language and the Bobo-fing who speak a language of Mande origins. There has also been a large influx of immigrant Mossi and Fulani from the Mossi Plateau to the Volta Noire and other areas farther south that has been widely covered in the literature (Eicher, Baker, 1982:232).

The end result of the higher rainfall, greater water resources and more fertile land in the Volta Noire is that higher yields per hectare are common in this region. With its lower population density and higher yields the cereal output per capita is generally in excess of the resident requirements in the region. (See Grain Production per Capita, Table 4.1). The former Volta Noire is, in most years, a net exporter of cereal grains.

#### 4.2.1 Tissi-Sourou Province, Gassan Subprovince

Located 60 kilometers north of Dédougou, Tissi has no market of its own. A large number of transactions take place on a household to household basis often along kinship lines due to this lack of a marketplace. The most frequented market is at Gassan, 9 kilometers to the northeast, where OFNACER sells cereals through the ORD. The markets in this area are generally on a five-day cycle. There is a cereal bank in Tissi that collects for OFNACER but the harvest in 1983-84 was not sufficient for the buying campaign to be successful. There is no regular means of motorized transport to Tissi and villagers will use bicycles, mbylettes, donkey carts, and often walk to neighboring villages for their purchasing needs.

The ethnic mix in Tissi reflects the northern region of the Volta Noire with a predominantly Dafing population mixed with a few Mossi and

TABLE 4.1  
AVAILABLE GRAIN PER CAPITA<sup>a</sup>

Year	Center	Center East	Center North	Center West	East	Hauts-Bassins	Yatenga	Sahel	Bougouriba	Volta Noire	Total
1971	131.32	127.68	177.94	71.549	164.03	127.28	99.991	67.155	260.97	167.59	135.21
1972	136.32	131.43	153.30	87.972	162.12	112.86	106.97	49.821	256.63	162.95	133.00
1973	125.31	119.35	145.79	111.55	41.206	111.57	96.621	49.956	122.45	136.41	111.40
1974	207.24	111.91	156.74	167.81	197.84	184.39	143.90	105.27	110.91	128.11	158.79
1975	152.10	182.80	169.19	191.33	195.90	175.83	152.68	106.61	165.95	284.40	180.33
1976	129.99	126.76	127.00	83.178	203.00	128.37	100.78	98.892	148.44	226.25	135.30
1977	146.97	133.59	151.87	87.569	214.39	138.20	111.02	72.294	153.02	269.52	148.33
1978	127.18	127.83	147.71	108.11	200.63	191.07	115.14	119.72	168.47	224.55	150.77
1979	152.84	145.51	129.62	97.987	208.68	174.61	99.954	98.874	176.63	241.86	151.50
1980	127.26	156.84	93.621	85.713	120.21	172.10	57.807	99.313	184.56	188.80	126.21
1981	159.25	153.28	159.54	107.39	166.71	182.12	99.636	146.80	189.86	211.38	155.93
1982	149.04	121.18	105.60	78.534	165.65	197.70	76.078	122.07	187.26	237.99	142.26
1983	129.51	166.23	100.98	100.93	153.28	152.34	74.306	77.924	153.07	204.25	130.53

SOURCE: Ministry of Rural Development Statistical Bulletins.

NOTE: <sup>a</sup>Available production calculated as regional production less 15% for losses and seed.

Fulani immigrant families. The village is devoutly Moslem and there are numerous marabouts, or religious instructors, among the Dafing households. Nearby, 7 kilometers to the east, in the village of Zaba there is a Catholic Mission where there is a mother and infant child clinic where children are weighed and food supplements distributed at below market costs.

In Tissi, the main food crops are red and white sorghum with some quantities of millet. The cash crops of preference are peanuts and beans. The Dafing of Tissi cultivate red sorghum for their own consumption and not for beer brewing as reported from other regions and ethnic groups in Burkina Faso (see Saul 1980). Because Tissi is strongly Moslem no beer brewing occurs in the village. In years of surplus the villagers of Tissi will sell cereal grains but the 1983-84 agricultural year had poor rains and this activity was curtailed. Tissi remained, however, the largest seller of cereal grains among the four original villages chosen for analysis.

#### 4.2.2 Dankui-Mou Houn Province, Ouarkoye Subprovince

Dankui is located 50 kilometers south of Dédougou and 25 kilometers east of the Volta Noire river. The Bobo-Oulé are the original inhabitants but both Mossi and Fulani immigrants have been moving into the area over a period of 16 years. The present population make-up in Dankui is 33% Bobo-Oulé, 30% Mossi, and 30% Fulani the remainder consisting of solitary Samo and Dafing families.

Within the confines of Dankui village there is no market but the neighboring bush market, at Tchiookui, which is claimed by the farmers in Dankui as their own. In fact, the Tchiookui marketplace is on Dankui land but the inhabitants near the market claim it for themselves. This situation arises because many farmers have separate housing in their fields near Tchiookui and they no longer want or have ties to Dankui village. Little more than 'bragging rights' seem to be at stake and no one is denied access to the market which meets on a 7-day cycle.

The major food crops in Dankui are sorghum and maize, with white sorghum preferred overall. The cash crop of Dankui is cotton and it is a major source of income for farmers in the area. At buying time SOFITEX establishes three different points of purchase in the village area of

Dankui. This strategy mirrors the dispersed nature of the community due to their farming practices and ethnic 'suburbs.' It also reflects the importance SOFITEX places on the timely collection of cotton in the rural areas. With cotton production credit is more available, fertilizer and pesticides are more readily obtained and traction is prevalent because of the vertically integrated monopoly of SOFITEX. SOFITEX provides all these services itself or through the ORD in order to motivate the farmers to produce cotton. Livestock are also important income earners in Dankui where poultry are particularly favored as a source of revenue by the farmers. The Bobo also buy and sell pigs which the Mossi and Fulani, generally being Moslems, won't raise.

The neighboring town of Ouarkoye (4 kilometers east) is the administrative seat in that area. It also has an OFNACER warehouse at which Dankui farmers and other surrounding villagers buy cereal grains. There is a cereal bank in Dankui but it doesn't function mostly due to lack of interest and qualified administrative personnel.

## CHAPTER 5

### NON-FARM PARTICIPANTS IN CEREAL GRAIN SECURITY

The focus of this report is on farmer decision-making with regards to cereal grain security at the household and regional levels. One cannot begin to understand farmer strategies, however, without an appreciation of the environment in which his or her decisions are made. The last section outlined the natural and social environment of the four villages studied. This section will present the other major actors in cereal grain security that influence the market and economic environment faced by the farmer.

The three major non-farm participants are identified as OFNACER (the cereal marketing parastatal), cereal banks, and private traders. This section will concern itself with the local actions of these institutions in the regions surrounding the four sample villages. Critiques on a national basis for these institutions are available in the literature including OFNACER (Enger:1981), cereal banks (Kat:1983) and the private market (CRED:1977 and 1987--see Volume I).

#### 5.1 OFNACER

OFNACER's major activity in the four villages studied was to support consumers. No direct sales to OFNACER were recorded in the year data was collected. However, purchases, by farmers, directly from OFNACER were reported in all four villages. The quantity purchased by farmers at OFNACER appears to be a function of availability (did the OFNACER warehouse have grain) and location (was there an OFNACER outlet within traveling distance of the village). None of the villages of study had OFNACER sale or purchase points located within their confines.

For Mené there was a small OFNACER warehouse in the subprovincial administrative seat at Koumbri 15 kilometers northwest. The supply at this location was irregular and information of stocks for sale passed by word of mouth, usually through those people who frequented Koumbri on market day or for resolving administrative affairs. A more reliable OFNACER source was at the major storage point in Titao which is 28

kilometers southeast of Mené. Observations were recorded in the survey data of sample farmers who traveled to Titao for cereal purchases at the OFNACER warehouse located there.

In Bougouré, like Mené located in the deficit region of Yatenga, sample farmers were observed traveling the 34 kilometers to Ouahigouya and the main regional OFNACER warehouse. This location was favored over the OFNACER warehouse in the equidistant subprovincial seat of Gourcy because the supply was more regular in Ouahigouya.

In the surplus region village of Tissi the nearest OFNACER outlet was in Gassan (9 kilometers) where OFNACER acted through the ORD representatives based in that subprovincial administrative seat. The supply was irregular and due to the other duties of the ORD personnel it could often be difficult to locate the selling agent on any particular day. This village was the least able of the sample villages to avail itself of OFNACER's consumer support.

In Dankui, the second surplus village, the OFNACER warehouse was located in and was under the auspices of the local administrative seat at Ouarkoye (4 kilometers). A similar situation to that encountered by the villagers of Tissi was evident in Ouarkoye as the keeper of the warehouse key and accounts was a local police officer who often had other duties to attend to. Nonetheless he was more readily found than the busy ORD official, and the stock was more regular, so that major purchases were made by Dankui sample farmers at the Ouarkoye OFNACER warehouse.

## 5.2 CEREAL BANKS

There was, in each of the village sites except Bougouré, some physical structure that was referred to as a cereal bank. There was a wide range of ability across the cereal banks in the study to function effectively, if at all. These differences could be attributed to the lack of capital, administrative expertise, and/or perceived need on the part of the village cooperatives that run the banks.

A major influential characteristic of the Yatenga region is the importance of cereal banks in the province. Cereal banks are usually found in smaller municipalities than the OFNACER warehouses and are locally administered by village cooperatives. There are two major types

of cereal banks within the region: the government sponsored ORD banks and privately funded banks. As of February 1984 the ORD counts twenty-one banks and twenty-six private banks operating throughout the province. Each bank aspires to buy cereals right after harvest when prices are lower and then resell the stock in the difficult season before the next harvest when food stocks are low and prices are high.

The twenty-six private cereal banks in Yatenga mentioned above are all financed by an international organization called Six S ("Se Servir de la Saison Sèche en Savane et au Sahel"). Its name is taken from the acronym of its title that urges one "to utilize the dry season in the Savannah and Sahel." Six S is a consortium of the Swiss Government, Miseréon, Action de Carem, Comité Catholique de la Lutte Contre la Faim et pour le Développement, Cébéma, and the Conseil Coopératif d'Québec. It was established in the early 1970s to begin rehabilitation and development principally in the Sahel with funding from the Swiss and Canadian governments plus church associations. Since 1980 the Six S has supported the 'groupement naam' system in the Yatenga.

The 'groupement naam' system is an alternative village cooperative to that proposed by the ORD. It is based on the traditional Yatenga Mossi social system of cooperative labor. A village will often have the ORD 'groupement villageois' existing along with a Six S 'groupement naam.' They may be in competition or they could share members but both offer their services to all members of the village community.

In Mené there is a Six S and an ORD cereal bank both of which are well run. Sales are made to all farmers even those that come from neighboring villages. However, credit sales are made only to members of the village in which the bank is located. Through experience the bank administrators had found loan default rates for people outside of the village to be too high. The supply of cereal at the bank is the administrators' major concern in the deficit villages because demand far exceeds available supply. The banks are dependent on outside sources of grains when the supply from their own purchase campaigns is exhausted. In 1983 the Mené ORD cereal bank was able to collect approximately 12 tons in its buying campaign. After this stock was depleted, through farmer purchases, additional supplies were obtained through the OFNACER

warehouse in Ouahigouya. Lack of a stable stock of cereals keeps the cereal banks from increasing their market share in the rural communities they serve.

Bougouré did not have a cereal bank at the time of this study but the neighboring village of Ziga (7 kilometers) had one that functioned quite well and some farmers would purchase cereal grains there. This serves to point out that the cereal banks do not restrict access to purchase of their stock to farmers from outside their base village. The cereal bank in Ziga was an ORD sponsored cereal bank.

As was pointed out earlier the surplus area cereal banks have a different 'raison d'être'. They primarily act as collection agents for OFNACER and SOFITEX in the rural areas. The village cooperatives that run the cereal banks in the former Volta Noire are primarily concerned with the collection of agricultural products and not their distribution. They are more an instrument that supports producer prices than an institution supporting consumer prices, as seen in the deficit areas. In the 1982-83 buying campaign the ORD of the former Volta Noire estimated that approximately 2000 tons of cereal grain were purchased through village cooperatives for OFNACER (Ministère du Développement Rural, 1982:10). The majority of the cereal banks in the former Volta Noire are ORD sponsored.

The cereal banks in both of the surplus village sites of Tissi and Dankui had reduced operations during the time of the study. Their function as a cereal grain bulking operation was curtailed due to the poor harvest and drastically reduced marketed surplus. Neither cereal bank in the two villages made a sale to farmers in the 1983-84 agricultural year. Farmers in Tissi did avail themselves of the cereal bank in Gassan for minimal total purchases. Farmers in Dankui made no appreciable purchases at cereal banks in the area. Again, this reflects the nature of cereal banks in the surplus areas as collection and not distribution centers, as was the case in the Yatenga.

### 5.3 PRIVATE MARKET

The final non-farm actor in the cereal grain security arena in Burkina Faso is the private grain trader. As was mentioned in the

methodology section the sample villages were chosen with different access to local markets. The range was from a major cereals market village to a village with no market existing within its boundaries.

In years of good rainfall Mené is known as an exporter of millet, the crop that is most adaptable to its sandy soils. Mené is well serviced by the private market with two large traders, four medium level traders, and numerous petty sellers. Cereals may be bought in very small retail quantities to the 100 kilogram sack. All of the traders are residents of Mené but the large traders also have residences and shops in the regional capital of Ouahigouya. The four medium level traders buy and sell in the surrounding area and may have purchase agreements or loans with the large traders. The petty sellers are most often women from Mené and the surrounding areas. Women from neighboring villages often come to Mené to sell and will want to return home the same day. This has opened a niche for the wives of Mené farmers to buy and store cereal grains for resale across market days.

Whereas the petty sellers and medium level traders deal mostly with purchases made within the region surrounding Mené, the large traders will often obtain stocks from Ouahigouya, and as far away as Bobo-Dioulasso, in order to meet local demand. Some of these stocks are sold to the medium size traders for retail sale within the village. The large traders themselves also continue to sell at a retail level on every market day in Mené in order to reinforce their long developed trader-farmer contacts. These 'home-boy' traders insure that the village will have a supply of cereal grains throughout the year.

Bougouré offers a stark contrast to the well established market of Mené. No traders reside in the village and only small traders frequent Bougouré on a regular market circuit when they have cereal grain to sell. This 'thin' market is most often frequented by farmer sellers or their wives. Sample members who had bought or received a 100 kilogram sack of cereal elsewhere (Ouahigouya, Bérénga, etc.) for their own consumption would sell a portion in the market to cover their transport costs of bringing the sack to Bougouré.

Sample members recounted that large traders came to Bougouré to buy and sell as late as 1980 but with the poor rainfall in the area no outside traders had frequented Bougouré. One farmer in the sample

admitted being involved in the cereal trade but had returned to farming due to the increasing costs of trading. The warehouse in which he stored cereals remains, with no roof, unused next to the Bougouré market. Generally no sacks of cereal are bought or sold in Bougouré's market; only the small retail quantities are available up to approximately 16 kilograms.

The village of Tissi had no established market itself and was dependent on the village of Gassan and other neighboring villages for its major marketing needs. Although Gassan was a well-serviced market with many buyers and sellers the sample members of Tissi most often bought and sold their cereals at home or at a neighbor's house. This was also the case when they visited other small villages in the area that had no markets. With these types of transactions lineage lines are very important. A relative who lives in a neighboring village not only acts as a source of information as to who has surplus to sell, but can also act as the bulking agent for the consumer-buyer. The persistence of non-market transactions in this area would appear to be due to the lack of established markets in the villages.

A similar situation, but less pronounced, occurs in the second surplus village of Dankui. Here the farmers will make sales and purchases at their temporary 'bush' homes in the fields during the agricultural season. These transactions are in addition to the type of household sales and purchases seen in Tissi. The difference in the two village sites in the surplus region is the growing importance of the market at Tchiookui which, although situated a good distance from the village center of Dankui, is closest to the present fields of some farmers. There are two resident traders that frequent Tchiookui who also farm.

## CHAPTER 6

### PRESENTATION OF RESULTS

This section presents village aggregate results from the dataset for consumption, purchases, sales, amounts received, and amounts given of cereal grains. Through examination of these data over time, in months of the year, and space, by location of transaction, the basic strategies of farmers to meet their cereal grain security needs will become apparent. Cereal grain flows out of the household (sales and amounts given) will be discussed first followed by cereal grain inflows (purchases and amounts received) on a village by village basis. Aggregate village consumption is also discussed.

The data supporting these discussions are not presented because of a recently discovered error.<sup>1</sup> This error will change some of the absolute values, but not the patterns or relative values. This chapter focuses on transaction patterns over space, time, and outlet; and it makes relative comparisons. These results are expected to hold after the data are corrected.

#### 6.1 MENE

##### 6.1.1 Cereal Grain Outflows

In Mené there is a notable paucity of transactions observed. The sales that were made consisted mainly of farmers' wives selling in small quantities. The peak in March reflects mostly the activities of these women who have limited capital and must buy when the cereal prices are low. Some women use their cereal purchases to prepare local foodstuffs for sale on market days. There appears to be two groupings of sales, one just after the harvest and one just before. Harvest in this region generally occurs in October and November.

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<sup>1</sup>Anyone interested in the Village Studies data should contact International Agricultural Programs at the University of Wisconsin, Madison, WI 53706, U.S.A.

All the cereal sales in the sample were transacted in the Mené marketplace. Since all sales took place in the market there was no change in location preference of sale with time. Disaggregation of the data might show minimal sales in other neighboring markets but the overwhelming majority of the data will point to Mené as the village of sale.

Cereal grains given away can be as notable as sales in Burkinabé society. The total amount of cereal given over the year was slightly greater than that of cereal sales. The January peak represents post harvest gift giving for festivals and the Moslem tithe ('zaka'). The second peak in September reflects the fact that the Moslem festival of Tabaski fell on 6 September in 1984. This is traditionally a period of gift-giving for Moslems.

#### 6.1.2 Cereal Grain Inflows

The cereal grain inflow data is more dramatic than that of the outflows in the deficit region villages. Clearly this is due to the fact that farmers in deficit areas must make up their production shortfalls through purchases or some other cereal inflow (gifts, remittances, etc.). Whereas in sales one observed quantities transacted of approximately 100 kilograms or less per month, purchases are commonly in the thousands of kilograms per month.

There is no discernible trend in the aggregate data to indicate a time preference for purchase. Perhaps when the data on the wealth classes in the sample are available, disaggregation along wealth groups will point to preferences in time. Of immediate interest are the changes in type of cereal purchases with time. Millet, the cereal of taste preference in Mené, is the dominant cereal purchased from December through March. White sorghum then makes a strong showing in April and May. Rice begins to appear as a purchase in April and May for the Moslem month of fasting known as Ramadan. During this month Moslems fast during daylight hours and consume large quantities and different types of food at night. Rice continues to be of importance after Ramadan as farmers realize the price differential between rice and the coarser grains has narrowed. Rice purchases are again large for Tabaski in September; and

by October approximately one quarter of all purchases are rice as the coarse cereal grain prices have peaked, and farmers are substituting into rice which can feed more people for the same quantity purchased.

June marks the appearance in the village of food aid, most common is the U.S. red sorghum which represents between 20 and 50 percent of all cereal purchases through the months of June, July, and August. In August, maize coming through private traders who have purchased that cereal through intermediaries from the coastal nations of Ghana and Ivory Coast makes an appearance in the Mené market. From July to October and the new harvest food aid and imported maize or rice make up approximately 50 percent of all cereal purchases in the sample.

The dominance of the local market is readily apparent but the growing importance of cereal banks should also be noted. Greater than one quarter of all purchases in the village were made at the cereal banks (either ORD or Six S). It is also notable that food aid purchases were made at either OFNACER or the cereal banks. Very little if any was purchased in the market.

The months of December, January, and February saw the dominance of the market for millet purchases. March and April saw a turn to white sorghum and a dramatic increase in cereal bank purchases. This coincided with the cereal banks' decision to begin sales of the stock from their 1983-84 buying campaign. The ORD cereal bank had wanted to hold off sales until later in the season, but public pressure to sell at an earlier time, due to the poor harvest, influenced them to change the timing of their selling campaign.

Very quickly, by May, the cereal bank stocks were depleted through farmer purchases and household to household purchases became more important. Cereal banks regained their position in the Mené market by selling food aid beginning in June and continuing until November. The food aid, mostly U.S. red sorghum, had been purchased wholesale at the OFNACER warehouse in Ouahigouya. A consortium of farmers, traders, and members of the local Committee for the Defense of the Revolution (CDR-political action committees formed after the Revolution) went to OFNACER to obtain the cereals. Through the auspices of the 'home-boy' trader, who had a license to deal with OFNACER, the cereal was transported to the village using his trucks.

For the remainder of the year the private traders recapture part of their share of the market by selling rice and maize. Rice, the former 'luxury' grain, is now competitive to local grains due to the formers' high price. Maize was brought in from Ghana and Ivory Coast which were having good harvests in 1984.

Only white sorghum, millet, and the U.S. red sorghum, given as food aid, were received as gifts. Households who had originally purchased the red sorghum would, in turn, redistribute that cereal through gifts to other families within or outside the village. Remittances in the form of cereals were sent to households in the sample from family members outside the village who had surplus production. The bulk of these cereal remittances and other gifts of cereal take place during the pre-harvest 'hungry' months of July, August, and September. This is not only due to the largesse of the giver but also the increasing requests for assistance made at this time of the year.

Comparing consumption over time versus purchases over time, particularly for millet, is especially enlightening. Millet is consumed throughout the year as 50 percent and often more of the total cereals consumed. Millet purchases on the other hand appear to decrease with time implying that there is another source of millet that the farmers draw upon as time increases towards the 'hungry' season. There is, in fact, another millet source and it is the farmer's own storage. Farmers prefer to purchase a large percentage of their cereal consumption needs in the market early in the year, as prices are low and supplies abundant. As prices rise and supplies dwindle, farmers switch to larger dependence on their own stored production to meet their cereal consumption needs. When wealth group information becomes available it will be interesting to see if this strategy is limited to farmers falling within a certain wealth category.

## 6.2 BOUGOURE

### 6.2.1 Cereal Grain Outflows

Bougouré is the poorest village in the study and this one fact goes a long way in explaining farmer behavior in this, the second deficit region

village. Very small quantities are sold throughout the year. The largest sales for the village are made in November, right after harvest and are an example of the classic 'distress' sales often found among poor farm households. 'Distressful' in the sense that cash needs are high at that time of year and the farmer cannot wait for the higher prices that come later in the year. The overall dearth of sales clearly indicates a deficit production situation.

Sales that are made are about equally distributed between the market-place and household or field sales. This is a reflection of the 'thin' (i.e., low volume of trade) market occurring in Bougouré. Most 'distress' sales occurring in November were made at the household level and may, in fact, reflect that some farmers are selling to others who come to them and ask to make small purchases.

Cereal grains given away are large as compared to the negligible amounts sold. For Bougouré, the peak of cereal gifts occurs around and after harvest when the traditional festivals are held and those Moslems in the village must donate their 'zaka' to someone less fortunate.

#### 6.2.2 Cereal Grain Inflows

Purchases far outweigh sales and the preference of villagers of Bougouré for white sorghum, as opposed to millet in Mené, is clear. Beginning as early as May, and continuing throughout the study, food aid purchases were a major component of cereal grain purchases in Bougouré. The locations of those purchases are dominated by OFNACER whose warehouses were located in Ouahigouya and Gourcy, both approximately 34 kilometers from Bougouré. Again, all food aid purchased came from OFNACER and some white sorghum was obtained from cereal banks in neighboring villages (notably Ziga).

OFNACER purchases increased as the year progressed and hit their zenith in the 'hungry' season month of September. A fairly regular supply of cereal grains were obtained by Bougouré farmers at the OFNACER warehouses. Purchases from the cereal bank peak in April, as was seen in Mené, as the bank liquidates its entire buying campaign stock in a short period of time early in the year. As the major cereal bank in Ziga (7 kilometers from Bougouré) did not obtain food aid or any other source of additional supply later in the year its importance in the marketplace

diminished to nothing. Farmers were thus obligated to travel to Ouahigouya or Gourcy to obtain cereal grains.

Remittances are very important to cereal inflows in the village. Relatives living in more favorable agro-climatic zones send cereal, and household members who have gone off to visit those households purchase and send cereal back home. The peaks occur earlier in Bougouré, April through July, than in Mené because the situation was more dire in Bougouré and cereal requests of relatives were made soon after the new year. Late in the year some maize is also received that may come from relatives or be redistributions of maize bought in the market that came from the coastal countries.

The consumption data reports low kilogram values in the beginning of the study. This was due to problems with the interviewer in the early stages of the data collection that were subsequently resolved. In spite of this limitation on Bougouré's consumption data, some interesting observations can be made. White sorghum generally dominates the consumption data until the new millet crop is harvested in October, at which time millet dominates the consumption pattern. This implies that most farmers in Bougouré can't afford to store their production and purchase cereals right around harvest when prices are low. Given that Bougouré is the poorest village in the sample the strategy of buying market cereals for consumption early in the year and postponing consumption of own production may be income specific.

### 6.3 TISSI

#### 6.3.1 Cereal Grain Outflows

The greatest quantity of cereal sales was recorded in Tissi the northern-most village chosen in the surplus region. The majority of sales were made just after harvest. A second cluster of sales just prior to harvest in the months of August, September, and October might indicate some farmers waiting to sell at the time of highest prices. The bulk of the data, however, implies 'distress' sales occurring around or just after harvest. Again, disaggregation when the wealth categories become available will provide further insights into this sales phenomenon.

What is most striking about the Tissi data is the importance of household and field sales in the transactions information. Only a small quantity of sales takes place in the market. Of course, Tissi has no market of its own, and this goes a long way in explaining why farmers have turned to household and field sales. There are limitations to the interpretation of events because of uncoded data on the location of sale in January particularly for the large millet sales that occurred in that month. Subsequent examination of the original questionnaires found this data to have been excluded during data entry. The majority of the sales in this time period were also made at households, generally by the wives of the farmers in the sample. The gross total of cereal grains given for the village far outweighs total gross sales.

The large peak in November is reflective of the Islamic character of Tissi with most Moslems giving their 'zaka' after the harvest. Another component of the large gift giving of cereals after the harvest is particular to Tissi. In Tissi the blacksmiths do not cultivate and therefore every farmer gives a gift of newly harvested cereal to the blacksmith that worked his tools for him during the agricultural season. It was explained that this system of no cultivation by blacksmiths frees them during the agricultural season to repair, replace or make farming implements upon demand by the farmers. The farmers do not pay for the services rendered but instead give gifts of cereal after the harvest. This is basically division of labor at the village level. Note that with the removal of the month of November's gifts for zaka and blacksmith services, total gifts would still exceed total gross sales. The increase in gifts from June to September most likely reflects work parties to perform agricultural labor in the fields.

### 6.3.2 Cereal Grain Inflows

Cereal purchases in Tissi reveal a preference for the sorghums both red and white. Some millet is also purchased which may reflect the tastes of the Mossi and/or Fulani members of the sample. Of note here is the importance of red sorghum purchases throughout the year and the rice purchases that lead up to the month of September and the Moslem festival of Ramadan. As was indicated for Mené some substitution into rice may be going on here as well.

The purchase location data is as striking as that of the sales with the market replaced in importance by household and field purchases. This, along with the sales location data, clearly reflects the absence of a market in Tissi. Of further note are the minimal purchases at OFNACER and cereal bank in contrast to what was found in Yatenga. OFNACER and cereal bank purchases occurred in the June to September 'hungry' season. However, they were minimal in comparison to purchases taking place across the entire year in households. The quantity of market purchases was relatively stable throughout the year and it will be most interesting to disaggregate this information to find which markets were preferred by the Tissi farmers. Finally, the general skew of the purchase data over time is towards the later part of the year implying farmers not being able to avail themselves of low post-harvest prices. There may be a bimodal distribution 'hidden' in this data that will make itself apparent when examined within wealth categories. The first node of the bimodal being those wealthier farmers buying in the market early in the year to avail themselves of lower prices while not consuming their own production until prices rise and markets dry up. The second node would be later in the year when the poorer farmers purchase cereals due to their inability to purchase just after harvest.

The data on cereal received over time shows possible work party gifts in the fields in July and August. But the bulk of gifts are received after the harvest for 'zaka' and festivals. The consumption data verify that red sorghum is consumed and not used in beer-brewing as is known to occur in villages throughout southern Burkina Faso. However, white sorghum is also consumed, as well as, millet. The gross millet consumed is much greater than that purchased and probably reflects the consumption of home production in this crop. Millet is more resistant to drought and may have been the best harvesting cereal crop for the Tissi farmer in the reduced rainfall year of 1983.

## 6.4 DANKUI

### 6.4.1 Cereal Grain Outflows

The behavior of Dankui farmers is greatly influenced by the fact that

the village is located in a cotton producing area. Many farmers in Dankui cultivate cotton as the major cash crop. After the cotton is harvested, usually in December and into January, SOFITEX collects and weighs each farmer's production during specially arranged cotton market days in the village. However, the farmers are rarely paid on time and must usually wait one to two months before receiving their money. Thus at the beginning of the year farmers must sell cereal grains, but in relatively small amounts, only to meet immediate cash needs. Very few, if any, cereal sales occur after the first quarter of the year after farmers receive their cotton money. This is considered to be the classic response of farmers, to sell foodgrains only to meet immediate needs, in a cash crop dominated production system where payments by a monopoly buyer are often late. Dankui is in exactly that situation.

Concerning sales location Dankui is similar to Tissi with the majority of sales taking place outside the market at households in the village or in the bush. The difference being that the markets in Tchiookui, and elsewhere, are of greater importance in Dankui than similar markets surrounding Tissi. The majority of sales immediately after harvest occur at the bush homes of the farmers. Market and household sales become important as farmers move back to their more permanent homes in the village around the new year.

As in all the villages presented, the gross cereals given greatly exceed cereal sales. Farmers in the regions of study prefer not to sell cereals especially in a year of poor agricultural production due to reduced rainfall. Again gifts after the harvest, for either traditional festivals or Moslem 'zakas,' are noted. From May to September agricultural work parties are major reasons for giving cereals. Throughout the year, and this is true of the other villages as well; marriages, betrothals, funerals, and baptisms account for cereal gift-giving.

#### 6.4.2 Cereal Grain Inflows

The purchases data over time appears to be a more pronounced example of the bimodal purchase behavior discussed earlier. We await the outcome of the wealth analysis to test this hypothesis. What can be observed

from the histogram are rice purchases beginning around Ramadan and continuing through to Tabaski. The purchase location data are interesting due to the importance of an OFNACER warehouse in a generally surplus area. It would be interesting to know if these sales by OFNACER are just a reflection of the poor cereal crop year of 1983-84 or if they are an annual occurrence. Otherwise a large amount of purchases occur at other households, but the marketplace is gaining ground as a point of location for transactions.

Purchases at OFNACER are prevalent during the 'hungry' season of July through October and even continuing into November. Household level cereal purchases appear to be bimodal as are the overall aggregate purchases. Cereal banks are noted by their absence and play no part in the cereal purchase strategies of Dankui farmers, principally due to the lack of a functioning cereal bank in the area.

Cereals received are spread throughout the year reflecting the natural dispersion of births, deaths, and marriages, events at which gift receiving is most common. The peak in September of maize represents the new crop harvest beginning and that gifts are being given to the 'griots' who do little or no agriculture. 'Griots' are the verbal historians and music makers in this area who may play music at agricultural work parties but do little cultivation themselves. Another recipient of the large gifts at this time of year is the local unremarried widow who was part of the Dankui sample.

Dankui villagers also consume red sorghum. However, some of their red sorghum does go to brew beer especially among the non-Moslem Bwaba. Consumption peaks around June through August, perhaps reflecting the higher consumption needs due to the agricultural labor performed in the fields at this time of the year. The millet crop arrives in October and is consumed thereafter while maize which matures before the millet is generally roasted and eaten directly in the fields and generally eluded the consumption survey.

## CHAPTER 7

### SUMMARY OF RESULTS

This monograph has attempted to introduce the major actors on cereal grain security in Burkina Faso and to analyze their various roles through data collected at the farm level for the 1983-84 agricultural year. This final section examines each participant individually in light of the information presented on the analysis of that data at the village aggregate level. The report concludes by outlining possibilities for improvement, given the parts played by each character as revealed in data, in the cereal grain security of Burkina Faso.

#### 7.1 OFNACER

OFNACER, whether selling directly from its warehouses or through wholesale dealings with cereal banks, does have an impact on the rural community and its cereal grain supply and price. It is however faced with the 'double whammy' as described by Lele (Valdés, 1981:104). A situation in which the parastatal is faced with increased consumer demand at the same time that their stocks are lower due to reduced marketed surplus in a deficit cereal production year. OFNACER's response has been to increase their supplies through the acquisition of food aid in order to meet this demand. Some put an estimate of OFNACER's dependence on food aid at almost 80 percent of all its sales (Enger, 1981:X.4).

#### 7.2 CEREAL BANKS

Cereal banks vary considerably from one village to another and from region to region. Those in the Yatenga appear to be effective market participants when they have cereal to sell. The cereal banks in the former Volta Noire are more effective as bulking agents for outside buyers, mostly OFNACER and SOFITEX. The variation across regions can be attributed to the goals set-up for the cereal banks at their inception. The Yatenga banks are seen as distribution centers while the former Volta Noire banks are collection agents. The variation within regions is

commonly attributed to administrative inadequacies and lack of capital (Pfluger 1984:26 and Kat 1983:Chapter VI, 3). Often overlooked however is the need for a stable supply to be furnished to the cereal banks acting as distribution centers. The data from this research indicate that a functioning cereal bank could capture a larger portion of the market if their supplies were adequate throughout the year.

### 7.3 PRIVATE MARKET

The private market appears to vary in its ability to meet consumer cereal security just as do the cereal banks. The markets in Yatenga are more established and have, if 'home-boy' traders are involved, a regular supply of cereal grains. Thin markets, such as Bougouré, are partly a result of the absence of this type of trader in the community. Other reasons often cited, by traders themselves, for not providing a 'backflow' of cereals into these thin markets include: low supply, the increased rate of credit defaults in chronically deficit areas and increased demands for outright gifts.

Further proof of the private market as non-homogeneous across the nation is the surprisingly limited importance of the private market to both sales and purchases in the surplus production areas. The market economy has as yet been unable to supercede the traditional exchanges that occur among households. In those parts of Yatenga where the private market is well established, for example Mené, household purchases and sales are minimal.

In other areas of established markets the private trade can be a major contributor to cereal grain security. Their rate of response to economic stimuli is much quicker than that of the parastatal OFNACER. Note the importation of freshly harvested Ghanaian and Ivorian maize into the extreme north of the country at Mené. Major traders in Ouahigouya are in daily contact, via telephone, with other major marketing centers in the country, notably Ouagadougou and Bobo-Dioulasso, in order to obtain market information. Traders with the knowledge of the market and the resources to act are able to respond to stressful economic circumstances in a short period of time. However, such traders are a

scarce human resource in Burkina Faso and by no means control trade in all corners of the country.

#### 7.4 FARMERS

The major realization resulting from the data is farmer aversion in the regions studied to cereal grain sales, particularly in a deficit production year. By preferring to hold their own production of cereal grains for home consumption farmers are implying that they have no confidence in either the government or the market to supply them with an adequate food supply at a price within effective rural demand. Quoting Lele (Valdés, 1981: 216) "rural food security is very largely a question of rural self-sufficiency." Lele continues by pointing out that the rural producer is well aware of this and that it is now time for urban government to adjust its thinking and policy options to reflect farmer strategies. In such a situation, where farmer strategies towards first meeting self-sufficiency requirements are tantamount, prices (as an incentive) will have less impact on marketed surplus than will the amount of production in excess of sufficiency needs. In regions where the interannual risk of crop failures are high (e.g. Yatenga) even a yearly surplus over sufficiency needs may not be marketed and instead put into long-term on-farm storage. Such behavior was noted, particularly among wealthy households, in the sample.

#### 7.5 POSSIBILITIES FOR IMPROVEMENT OF CEREAL GRAIN SECURITY IN BURKINA FASO

There is a need for each of the actors in the cereal grain security arena in Burkina Faso. A major confusion to observers and also to participants is that the respective roles have not been clearly defined. Radical and abrupt changes in conception of the roles of OFNACER and the private market were common in the 1970's (Enger, 1981:VIII.1). The search, often by trial and error, by the major participants to find their respective marketing niches has contributed to the overall uncertainty in cereal grain security in Burkina Faso. A major improvement would be a clear delineation of each role which would not only help policy makers

establish priorities but also win the confidence of the rural producer. To that end the following suggestions regarding the role of each participant are rendered.

OFNACER should explicitly acknowledge that its main strength is in cereal grain distribution, particularly of food aid. Collection of domestically produced cereals should be attempted only in known surplus regions. Cereal banks should be forwarded money to make purchases on OFNACER's account in those surplus areas where they are now located. Direct OFNACER purchases, via their agents, should be focused on those surplus areas that don't have functioning cereal banks.

In deficit regions OFNACER should act as a wholesaler of cereal grains to cereal banks who in turn retail the grain. This would increase the distribution of OFNACER's supply in the deficit areas and give cereal banks a source of stable supply. OFNACER should maintain its retail operations only in the major urban areas that don't have cereal banks. Cereal banks are a rural phenomenon. By working directly with the cereal banks OFNACER will be taking advantage of these emerging local institutions. At the same time OFNACER should make a commitment to those banks it chooses to work with to assist in training to meet the administrative needs of the cereal banks. The cereal banks should, however, retain their independence from OFNACER.

Food aid can certainly play a role in stabilizing the supply of cereal grains at OFNACER. The data indicate that food aid passing through OFNACER and the cereal banks does reach the remote rural communities. As always, food aid should be restricted in its scope so that it does not cause undesirable shifts in consumption preferences or decrease production incentives. It appears that the U.S. red sorghum, most commonly found in the sample villages, meets these restrictions. However, in order for OFNACER to be able to insure a stable supply of grain, long term donor commitments of food aid must be made. Such a known supply would enable OFNACER to set its distribution priorities in advance allowing for timely arrival of food supplies into the rural deficit areas.

Cereal banks with their greater geographic distribution than OFNACER warehouses are more directly accessible to the rural farmer. Witness the 34 kilometers Bougouré farmers had to travel, in the height of the

agricultural season, to Ouahigouya to purchase food aid. This could sometimes be a one to three day trip depending on the queue for cereals at OFNACER's retail store and the state of the road to Ouahigouya. A regular supply, furnished through OFNACER, at the Ziga cereal bank located 7 kilometers from Bougouré would have saved the farmer's time, or that of a young son, to work in their fields during the agricultural season. A one to three day loss of labor can be significant in an area of capricious rainfall.

Cereal banks should not curtail their own buying campaigns, but the availability of OFNACER stock and capital will ease the constraints under which they are now operating. Another source of supply could be the establishment of 'sister' banks between surplus and deficit regions. Such an arrangement would provide deficit area banks with additional supply and surplus area banks with additional demand. Transport could be arranged through the private sector on a cost per 100 kilogram sack basis and would bypass the inefficiencies inherent in passing all stock through a centralized warehouse. The ORD's could relinquish their role in cereal bank development to OFNACER, the government marketing agent, and focus on production activities.

The private market can continue to add to Burkina Faso's cereal grain security. Its activities can be enhanced through liberalization of trade, investment in transportation and communication. The OFNACER/cereal bank partnership would be viewed as increasing competition in the cereal grain trade. But OFNACER should continue its dealings with the private market through supply contracts with traders where the grain is to be delivered to a particular regional warehouse for wholesale distribution. By retailing through the cereal banks a stable supply could be assured in those thin markets where 'backflow' of private trade is minimal.

Up to this point the suggestions have focused on the stabilization of supply through institutional means. But as was pointed out earlier there is a second cause of food insecurity, and that is price. Once the supply is made available it must be sold at a price within the effective demand of the rural community. The basic problem here is farm income which is directly tied to farm output. Herein lies the farm level 'double whammy'

where farm incomes and cereal supply both decrease in years of poor rainfall. The farmer finds himself in an extremely difficult situation of increased prices and reduced income. In years of poor rainfall there is little that can be done but to subsidize cereal costs through OFNACER and the cereal banks. Food aid can play a major role here in assisting the government's attempts to preserve farm capital through subsidized cereal grain sales. Overall farm incomes will only be increased through increased output which is dependent on increased research on production systems in Burkina Faso.

In addition to the support the OFNACER/cereal bank partnership would give to farm incomes in years of low production the same arrangement would help retain capital in the rural areas. In the present situation in Burkina Faso both OFNACER and the private traders 'repatriate' the majority of their 'profits' to the urban areas. In the OFNACER/cereal bank partnership a portion of the margins would be captured by the village cooperatives that run the cereal banks. These profits could be reinvested in the rural community through the other activities of the village cooperatives. These activities generally consist of production enhancement programs such as soil and water conservation, reforestation, fertilizers and mechanization. Again, farmers are ahead of the urban policy makers in recognizing the problems they face and searching for solutions to those problems. The OFNACER/cereal bank partnership could help to relieve the capital constraints in the rural areas to increasing farm income.

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THE DYNAMICS OF GRAIN MARKETING  
IN BURKINA FASO

VOLUME III

RESEARCH REPORT 3

MARKET SURPLUS IN BURKINA FASO:  
A STUDY OF GRAIN DISPOSAL PATTERNS

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Prepared by  
Center for Research on Economic Development, University of Michigan  
and  
International Agricultural Programs, University of Wisconsin  
for  
United States Agency for International Development (USAID)  
Contract No. AFR-0243-C-00-2063-00

May, 1987

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## CHAPTER ONE

### INTRODUCTION

The response of subsistence farming households to changes in price and output has been the subject of a number of economic studies in developing and developed countries. The identification of the factors influencing farmers' supply response and marketing behavior has become an issue of increasing importance as the food production situation has worsened in the developing countries and in Africa in particular.

Since 1970, food grain production in Africa has decreased by two percent annually (World Bank 1984, pg. 2). In Burkina Faso (formerly Upper Volta) there has been a trend in decreasing food production. Policy makers have become acutely aware of the existing problem and potential for deterioration in conditions if the trends persist.

From December 1983 to November 1984, the Center for Research on Economic Development (University of Michigan) in collaboration with International Agricultural Programs (University of Wisconsin), studied grain marketing in Burkina Faso. As part of this joint project, the CRED/IAP researchers collected data on sales and purchasing patterns of farmers, in addition to data on the consumption, storage, harvest, and exchange behavior of farmers in the Yatenga, Volta Noire and Hauts-Bassins regions of Burkina Faso. Prior to proceeding with the analysis of farmer cereal grain marketing behavior in Burkina Faso a brief review of previous works will be presented so that we might understand the various contexts under which farmer decision-making has been examined. It is believed that this approach will guide the research in its goal of addressing the question of cereal grain marketing in Burkina Faso under the adverse condition of decreasing food production.

The following sections of the report will include a description of the characteristics of each of the regions in which the sample villages were located. A knowledge of the social and physical attributes of these regions is essential if one is to understand the food situation in which the farmers find themselves and to an analysis of their decision making patterns.

To supplement the general descriptions of the regional locations we have presented a detailed analysis of the economic position of each of the sample villages. The disposal and acquisition activities of the household are summarized for each village. Grain sales, consumption and transfers (amounts given) are presented as the disposal options of the household while cereal grains purchases and amounts received are the acquisition activities. The harvest position of each village (as of October 1983) and the stocks of cattle and small ruminants have been presented as well.

In the fifth section of this paper we have outlined the model of short-run marketed surplus response which was used in the analysis. We have presented our assumption, hypotheses and the results of the empirical estimation of the model. The paper concludes with a summary of the results which have been generated from the research.

## CHAPTER TWO

### LITERATURE REVIEW

The literature addressing the question of subsistence farmers' response to price and output changes can be classified according to two different approaches. The first approach examines farmer response to changes in price and output from the side of supply. Under this method, estimates are made of the yield and/or acreage supply response to a change in prices and stocks as well as a number of other variables. The second approach examines the marketed surplus response of farmers to a similar grouping of variables.

#### 2.1 SUPPLY RESPONSE LITERATURE

In general, the supply response literature has found that farmers in developing countries are responsive to changes in prices and hence, to market incentives. The evidence to support this claim has been put forth by such economists as T. W. Schultz, N. L. Dantwala, W.P. Falcon, M. Nerlore and J. Behrman among others.

T. W. Schultz has been the major supporter of the hypothesis that farmers in underdeveloped agriculture will respond quickly, normally, and efficiently to relative price changes (Behrman, 1968, pg. 3). He contends that the subsistence farmer, taking into account the amount of risk and uncertainty he faces will respond in a manner similar to that of farmers in developed countries. Those who agree with Schultz include Behrman, Dantwala, and W. P. Falcon. A Nerlovian dynamic supply response model was used by Behrman in his study of the supply response of rice production in Thailand. He concludes that farmers in economically underdeveloped countries respond significantly and substantially to economic incentives (Behrman, 1968, pg. 2-3). Dantwala and Falcon have both contributed to the identification of subsistence farmers as rational economic men responding to the incentives of the market. They emphasize that the response to changes in relative prices can be seen in the changing composition of output. W. P. Falcon found that the acreage response to price changes for cotton in the Punjab was +.40 for the

period of 1933-34 to 1958-59. Coefficients in the U.S. were found to be only about .35 for cotton (Falcon, 1964 pg. 584-85). In addition, Falcon concluded that there was sufficient reason to believe that the expected relative prices would have a significant effect on cotton yield as well. Falcon's analysis also included an acreage model for wheat in the Punjab. This model yielded a short-run price response of .1 to .2 which further suggested that even a major food crop was responsive to fluctuations in price. (Falcon, 1964 pg. 588)

The estimated elasticities were for single commodities rather than for an aggregate output in Falcon's analysis. It should also be noted that Falcon as well as Behrman, distinguishes between the acreage response and the yield response to price changes. Acreage, being more directly under the control of the farmer, is considered by some to be a more accurate reflection of the farmers' expected output than is yield which is subject to climatic variation and to variations in labor and capital inputs. In many circumstances in developing countries rainfall patterns can be the determining factor in whether or not there will be a harvest. This, of course, is completely out of the control of the farmer.

## 2.2 MARKETED SURPLUS RESPONSE LITERATURE

The second group of economists have examined the issue of responsiveness using models of marketed surplus. There has been some debate over the definition of the term marketed surplus. The definition of this term is important to the determination of the independent variables used in the analysis.

One way in which marketed surplus (M) has been defined in the past is total farm household production (Q) minus household consumption (C). This is derived from the output identity (1):

$$(1) \quad Q = C + M$$

where Q is total output of the subsistence crop, C is household consumption of the crop and M is the quantity sold.

Toquero et al. assume that output can serve two functions as noted above; it can be consumed or it can be sold. (Toquero, 1975, pg. 705). He assumed that the income of the farm household is generated solely from

rice production and that utility is derived from both the consumption of rice and a composite good which is purchased with the cash generated from grain sales. Toquero et al. derive a marketed surplus function and a demand function for consumption.

The marketed surplus function,  $M(P,Q)$ , is expressed in terms of the price of rice, a price index of non-rice commodities and the output or production of rice. From the identity we can show that consumption (C) equals output (Q) minus marketings (M):

$$(2) C = Q - M(P,Q)$$

where P equals the price of rice divided by the price index of non-rice commodities.

The quantity of rice produced is further assumed to be a function of P. This assumption is contradictory to that of W. Haessel who purports that in a reasonably self-sufficient closed economy price is endogenous to the system rather than exogenous.

Haessel also derives a marketed surplus function. He, however, contends that the output of cereal grains is disposed of in three rather than two ways; cereal grains are consumed, sold, and transferred to non-cultivators. These grain transfers are assumed to be contractually determined and hence exogenous to the system. They consist of payments in-kind for rents and wages etc.

Haessel then defines the output identity as:

$$(3) Q = C + M + T$$

where Q equals output, C equals consumption, M equals marketings, and T equals transfers to non-cultivators. Since we have previously assumed that T is exogenous our identity then becomes:

$$(4) Q - T = C + M$$

defining  $Q - T$  as R, the farmers' decision becomes one of allocating R in one of two ways; the household can consume or sell its output (Haessel, 1975 pg. 111).

$$(5) R = C + M$$

Marketings are then defined as the negative of consumption or:

$$(6) -C = M - R$$

He chooses to estimate the consumption equation to determine the price and income elasticities of home consumption and marketed surplus.

Haessel's model is used to critically analyze the work done by Bardhan on price and output response of marketed surplus in Northern India. His model is based on the premise that in reasonably self-sufficient villages the price of grain is endogenous to the system. It is affected by the quantity produced and by the quantity marketed and therefore cannot be included in an OLS model of marketed surplus and still produce consistent estimates of the parameters. The OLS procedure would be correct only if price were exogenous to the system (Haessel, 1975, pg. 111).

Dennis Chinn, however, disagrees with Haessel's formulation of a marketed surplus model. The explicit assumption made by Haessel that sales and on-farm consumption are strict complements is, according to Chinn, a limitation of Haessel's approach. This assumption, he contends, simplifies the analysis considerably and it also ignores the additional option available to the farmers of simply adding to (or subtracting from) existing stocks (Chinn, 1976, pg. 584).

In addition to considering explicitly the storage activities of the farm household Chinn also considers the possibility that farmers participate in barter activities. Rather than assuming in-kind disposals to be fixed by contractual arrangements (i.e. insensitive to price change) he considers barter or in-kind disposals of grain for household items to be a component of marketed surplus (Chinn, 1976, pg. 584). The simple marketed surplus model presented before has now been expanded to:

$$(3) \quad Q = M + B + E + C + S$$

where  $Q$ ,  $M$  and  $C$  are as previously defined,  $B$  is rice bartered for household consumption items,  $E$  is grain used to pay in-kind expenses including taxes and land rents, and  $S$  is the end-of-year stocks. Chinn's model was estimated using time series data. This model, unlike that of Toquero et al. or Haessel, recognizes explicitly the possibility that farmers may participate in intra-annual and inter-annual storage activities.

Marketed surplus,  $MS$ , is defined by Chinn as:

$$(4) \quad MS = M + B + E$$

Using this model, Chinn proceeded in the estimation of equations for four of the components of output taking  $S$  as the residual. The fifth equation estimated was for output.

A time series analysis of marketed surplus was also performed by D. K. Bhattacharya in his study of wheat marketing in the states of Punjab in Haryana India. His analysis consisted of the use of a dynamic linear expenditure system where parameters are estimated for an array of subsistence minima which are non-constant over time (Bhattacharya, 1980, pg. 6).

The farmer is assumed to maximize his utility (a Stone-Geary functional form is assumed).

$$(7) \log (x_1 \dots \gamma_1)$$

subject to:

$$(8) W + P_1 X_1 = \sum_{i=1}^k P_i X_i + E + S$$

assuming an interior solution we have:

$$(9) x_i = \gamma_i + \beta_i / P_i [W + P_1 X_1 - \sum_{i=1}^k P_i \gamma_i - E - S]$$

with marketed surplus given by:

$$(10) M_{x_2} = X_1 - x_1 = \gamma_1 (\beta_1 - 1) + (1 - \beta_1) X_1 + \beta_1 / P_1 \sum_{i=2}^k P_i \gamma_i + \beta_1 / P_1 [E + S]$$

$$(11) \sum_{i=1}^k \beta_i = 1, 0 < \beta_i < 1$$

In this model:

- $X$ : all commodities consumed by household
- $x_1$ :  $X_1$  is that commodity which is also produced by the household;
- $\gamma_i$ : subsistence minima requirement level for each commodity consumed;
- $W$ : wealth of farmer prior to production;
- $X_1$ : total quantity of output of  $x_1$ ;
- $P_{x_1}$ : market price of quantity  $x$  than can be sold;

- P: price of all other goods;  
 E: contractual expenses;  
 S: desired level of savings;  
 $X_1 - x_1$ : marketed surplus

Bhattacharya's contribution was the specification of a dynamic system for estimation of farmers' consumption and marketing behavior. Through the use of a simple adjustment function for the difference between the desired level of savings and actual savings Bhattacharya also modeled a dynamic system within a static framework.

### 2.3 SUMMARY

The previous discussion identifies two approaches used in analyzing price responsiveness. First, there is production response theory which identifies the long-run price elasticities of supply. Secondly, we have the theory of marketed surplus which examines long- and/or short-run price responsiveness. It should be noted that the long-run price elasticity of marketed surplus is a combination of both the long-run price elasticity of production and the short-run price elasticity of marketable surplus. (Bardhan, 1970, pg. 51).

If we consider a time period which is long enough for a complete adjustment in output to changes in prices we can show the relationship between the long-run price elasticity of production, the short-run price elasticity of marketed surplus and the long-run price elasticity of marketed surplus. (For a complete derivation of this relationship one should refer to K. Bardhan, 1970.)

Bardhan contends that the long-run price elasticity of production is likely to be positive while the short-run price elasticity of marketed surplus can assume either sign. (Bardhan, 1970 pg. 51) The long-run price elasticity of marketed surplus will then be dependent upon the magnitude and sign of the short-run price elasticity. If the sign of the price elasticity of supply is positive, as well as that of the short-run price elasticity of marketed surplus, then the long-run price elasticity of marketed surplus is also positive. If, however, the long-run price

elasticity of production is positive and the short-run price elasticity of marketed surplus is negative, the sign of the long-run price elasticity of marketed surplus will be dependent on the relative magnitudes of these elasticities. If the absolute value of the short-run price elasticity of marketed surplus is greater than that of supply, then the long-run price elasticity of marketed surplus is negative; if it is smaller then the long-run price elasticity of marketed surplus it is positive.

Explicit definition of the type of response being analyzed is essential. If we have identified the analysis of long-run response as appropriate then we must distinguish between a long-run supply response and a marketed surplus response. The commodity or commodities examined must be carefully identified. The identification of the supply response of aggregate agricultural commodities is a different issue than that of cereal grain supply response. The determination of the later implies the definition of a group of homogeneous commodities, and makes a distinction between cash and home-consumed crops.

## CHAPTER THREE

### DESCRIPTION OF REGIONAL CHARACTERISTICS

In order to address the question of marketed surplus response of farm households in Burkina Faso, one must understand the context within which the farmers operate. For this reason we will first present a brief general description on the regions in which the study villages are located. We will be focusing on the identification of the predominant socioeconomic and agroclimatic characteristics of the regions. This discussion will be followed by a more detailed descriptive analysis of each of the villages including the examination of cereal grain purchasing and selling activities as well as other activities important to understanding the marketing decision-making processes of Burkinabé farmers. The year of analysis begins on December 1, 1983, and ends on November 30, 1984.

#### 3.1 YATENGA: THE DEFICIT REGION: MENE AND BOUGOURE

The province of Yatenga from the years of 1971 to 1983 has been consistently characterized by large deficits of cereal grains. Figures calculated on an estimated food requirement of 192 kilograms per person show the smallest deficit within that period being 20,840 tons in 1975. The largest deficit occurred in 1980 with an estimated 77,563 more tons being needed to fulfill food needs for the Yatenga (see Table 3.1). The deficit nature of the province is clearly representative of much of Burkina Faso and as a consequence, two villages were chosen in this province to represent farmer behavior in a subsistence agricultural system where the needs for consumption cannot be met with own-production.

The Yatenga province, which is presently divided into fifteen subprovinces, had an estimated population of 608,000 inhabitants in 1983-1984 (May, 1985, pg. 40). It is approximately twice as densely populated as the nation taken as a whole. The soils in this area are agronomically of little value; they are thin soils which are subjected to the problems of erosion. The annual average precipitation in this region

TABLE 3.1

## ESTIMATES OF REGIONAL DEFICIT/SURPLUS SITUATION (TONS)

Year	Center	Center East	Center North	Center West	East	Hauts-Bassins	Yatenga	Sahel	Bougouriba	Volta Noire	Total
1971	-53,461	-24,313	- 8,297	- 88,551	-10,626	-35,209	-45,544	-41,323	23,035	-14,501	-298,894
1972	-49,544	-23,320	-23,221	- 77,916	-11,563	-43,842	-42,771	-47,772	21,974	-17,546	-315,924
1973	-60,886	-28,407	-28,232	- 61,304	-59,413	-45,281	-48,834	-48,579	-23,995	-34,185	-439,116
1974	14,156	-31,876	-21,929	- 18,750	2,334	- 4,361	-25,062	-30,181	-28,462	-39,930	-184,059
1975	-37,705	- 3,725	-14,414	- 528	1,585	- 9,426	-20,840	-30,228	- 9,299	58,767	- 65,811
1976	-59,594	-26,880	-41,796	- 87,275	4,554	-37,733	-49,169	-33,612	-15,855	22,157	-325,204
1977	-44,042	-24,472	-26,285	- 85,215	9,427	-32,438	-44,457	-43,932	-14,422	51,007	-254,831
1978	-64,497	-27,337	-29,494	- 69,715	3,702	- 570	-42,888	-26,959	- 8,847	21,809	-244,798
1979	-39,630	-20,177	-42,232	- 79,440	7,271	-10,868	-52,281	-35,294	- 5,887	50,952	-244,590
1980	-66,682	-15,506	-67,783	- 91,407	-31,803	-12,637	-77,563	-35,777	- 2,900	- 2,220	-404,281
1981	-34,317	-17,385	-22,755	- 74,032	11,406	- 6,380	-54,309	-17,718	- 846	13,661	-225,491
1982	-45,794	-32,366	-61,605	-100,984	-12,093	3,634	-69,321	-27,903	- 1,910	32,973	-315,371
1983	-67,741	-11,982	-65,988	- 82,419	-18,081	-26,530	-71,557	-46,315	-15,961	8,942	-397,635

SOURCE: May, C. 1985, pg. 9.

NOTE: \*Calculated as Foodneeds (192 kg/person) less available production.

University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.

over a twenty-five (25) year period was 800 millimeters with an average of 250 millimeters falling during the months of August (Jeune Afrique, 1975, pg. 14).

The principal culture grown in this area is millet. It is grown alone and in association with white sorghum or peanuts in some areas. In this region cattle and small ruminants are very important to the agriculturalists. There are more than ten (10) bovine per square kilometer in the Yatenga and the number of small ruminants exceeds twenty (20) per square kilometer. Livestock and small ruminants also have an added economic significance in a region where rainfall is inconsistent within and between agricultural years. However, it should be remembered that these animals are also subject to climatic conditions. The drought which has affected much of Africa has also claimed a large part of the herds.

The two sample villages located in the province of Yatenga are Mené and Bougouré. The northernmost of the five (5) sample villages is Mené, located 45 kilometers northeast of Ouahigouya in the subprovince of Koumbri. The Fulsé compose approximately one third (1/3) of the village's 2,200 inhabitants with the remaining two thirds (2/3) being of the Mossi extraction (May, 1985 pg. 43-44).

There is a major village market which occurs every third day in Mené. The farmers are, therefore, provided with relatively easy access to food-grains as compared to the farmers of other villages in the region which have no local market in which to participate. These villagers must travel over difficult roads, particularly in the rainy season, to reach the major marketing center of Ouahigouya or the surrounding local markets. One example of such a village is that of Bougouré, the second sample village in the province of Yatenga.

Southeast of Ouahigouya by thirty-four kilometers is the village of Bougouré. The Mossi inhabitants are the predominant ethnic group in this village of approximately 1,500 (May, 1985 pg. 45). There is a small village market which is held every three days in Bougouré but it does not assume the importance of the Mené market. Market transactions take place between farmers, farmers' wives and petty traders. Because the supply in the Bougouré market of cereal grains is unstable a farmer in Bougouré

will have to travel longer and farther than one in Mené if he is in need of cereal grains. The farmers' uncertainty regarding the supply of grain in this village is higher if one considers market accessibility.

### 3.2 SOUROU AND MOU HOUN PROVINCES: TWO SURPLUS REGIONS: TISSI AND DANKUI

The provinces of Sourou and Mou Houn are part of the former province of Volta Noire. The villages of Tissi and Dankui were chosen previous to the new administrative division of political units and therefore are now in two separate provinces.

We will refer to the region as the Volta Noire throughout the analysis for ease of understanding as all figures published for the period of interest refer to the region as the Volta Noire. The former Volta Noire is presently composed of three provinces; Sourou, Mou Houn, and Kossi.

From 1971 to 1983 the Volta Noire has had eight (8) years of surplus and five (5) years of deficit food availability. The largest deficit occurred in 1974 when food need exceeded availability by 39,930 tons. From 1975 to 1983 there have been consistent surpluses with the exception of 1980. There was not one region in Burkina Faso where production exceeded food needs in 1980. The surplus availability in this region ranged from 8,942 tons in 1983 to 58,767 tons in 1975.

The total population of the former Volta Noire was approximately 730,000 in 1983-1984. Population density in this region is about equal to that of the national average of 24 inhabitants per square kilometer.

The soils in the region consist of hydromorphic soils which temporarily retain water. There are good soils for the planting of sorghum and in some cases rice as well. Cotton is also grown in the southern part of this region. Millet is not favorably suited to the soils in this area.

The average annual rainfall in the region over a twenty-five (25) year period has been nine hundred (900) millimeters with an average annual of two hundred and seventy five (275) millimeters in the month of August (Jeune Afrique, 1975 pg. 14). Livestock raising and small ruminant breeding are of less importance in this region than in the

previously mentioned Yatenga Province. In contrast to the ten (10) bovine per square kilometer in the Yatenga province, you'll find a slightly smaller number, ranging from seven to ten bovine per square kilometer in the Volta Noire. Small ruminants range from ten (10) to twenty (20) per square kilometer.

The sedentary breeding of small ruminants and bovine breeding done in cooperation with the Peul pastoralists predominate in this region. There is an insignificant amount of transhumant pastoralism.

Located in the province of Sourou, sixty (60) kilometers north of Dédougou, is the CRED/IAP sample village of Tissi. Since there is no local market in Tissi the villagers who wish to dispose of and/or acquire cereal grains, frequent most often the market of Gassan, located nine (9) kilometers northeast of Tissi. The marketing period in this area is every five (5) days. The farmers also have the option of selling cereal grains to OFNACER through the cereal bank that exists in Tissi.

The crops grown in Tissi include red and white sorghum and millet. The moslem traditions which are practiced by the predominant Wafing ethnic group prohibit the use of red sorghum for beer brewing. Red sorghum brewing is a common practice among the Bobo ethnic group.

The Bobo ethnic group consists of two sub-groups; the Bobo-Oulé and the Bobo-Fing. Dankui, the second sample village located in the Volta Noire is composed of one-third (1/3) Bobo-Oulé. In Dankui, as in Tissi, the villagers must travel outside of the village if they wish to participate in the market place. The majority of the farmers participate in the Tchiookui bush market. Buying activity also occurs in the OFNACER warehouse in Ouarkoye which is located four (4) kilometers east of Dankui. The cultivation of both sorghums, millet, maize, and rice occurs in Dankui. Cotton, which is purchased by SOFITEX a parastatal organization, is the major cash crop in this village.

### 3.3 HAUTS-BASSINS: A SURPLUS REGION: BARE

The variability of the climatic conditions in the provinces of Sourou and Mou Houn made it necessary to expand the study into another typically surplus region in Burkina Faso. A village site twenty-five (25)

kilometers southeast of Bobo-Dioulasso was incorporated into the CRED/IAP project through collaborative efforts with anthropologist Mahir Saul.

When looking at figures of food needs (192 kg/person) less available production the province of Hauts-Bassins has had one surplus year in the 1971 to 1983 period. This occurred in 1982 (see Table 3.1). The largest deficit of 45,281 tons came in 1973. Despite these regional figures, however, the village which was included in the sample was clearly a surplus village characterized by significant amounts of market activity (buying and selling).

The tropical ferrous soil in this area is iron rich. It is characterized by sedimentary material containing quartz, clay, iron, and sometimes aluminum. These soils are acidic and permeable. A brown utrophic soil which is well oxygenated and rich in mineral and vegetable elements is also present in this area.

The soils and climate in this region are well suited to the planting of white and red sorghum, maize, cotton, and peanuts in addition to the lesser crops of sesame and beans. The average annual rainfall over a twenty-five (25) year period is approximated at one thousand one hundred (1,100) millimeters with an average of three hundred twenty-five (325) millimeters falling in the month August, the last month of the rainy season. The patterns of livestock raising are similar to those in the former Volta Noire region of the country with seven (7) to ten (10) bovine per square kilometer and an average ten (10) to twenty (20) small ruminants in the same measured area.

In the village of Baré, (located twenty-five (25) kilometers southeast of Bobo-Dioulasso) the predominant ethnic group is the Bobo-Fing. There are a small number of Peul herders who have temporary residence in Baré during the agricultural season. The prime location of Baré has not gone unnoticed by migrating farmers. The agro-climatic conditions in Burkina Faso have forced northern inhabitants to migrate south. The people of Baré, however, have taken measures to check the influx of migrants seeking land to cultivate in this more fertile zone. Members of the Mossi ethnic group (with the exception of two people now living in the village) are forbidden to remain in the village overnight. This policy is enforced to prohibit the possible domination of land through the multitudes of Mossi migrants.

There is a market in Baré which has been in existence since February 1983. There was no market in Baré previous to this time, however, there were two local markets, one to the north and one to the south, which served the Baré villagers. These two markets (Yegrusso and Somoussou) are still frequented by the Baré villagers. Yegrusso (ten kilometers to the north) and Somoussou (9 kilometers to the south) are both frequented as well by regional and petty traders. In addition, the farmers also travel into Bobo-Dioulasso to participate in the second largest market in Burkina Faso. Transportation to and from this market is provided occasionally by bush taxi. Walking, biking, and riding a scooter are also popular means of traveling to the Bobo-Dioulasso market.

We have seen that the villages incorporated in the study of cereal grain marketing are representative of a diversity of agroclimatic and socioeconomic conditions in Burkina Faso. It is important to remember this when attempting to identify the patterns of cereal disposal and acquisition. It is even more important if one is analyzing the response of farmers to changes in policy. In this case we will be examining the short-run marketing response of farmers in Burkina Faso to certain policy variables; price and output.

To summarize, we can say that the villages can be identified as belonging to two different regions of food needs. Mené and Bougouré are located in a region which typically shows food needs in excess of production. This area should illustrate the acquisitional behavior of farmers and the consumer response to policy variables. While some selling does occur, the majority of people are net purchasers of cereal grains. Within the deficit region, one village, Mené, represents those villages with relatively easy access to markets while Bougouré presents us with a village where food grain security is more precarious as surrounding bush markets are unstable in cereal supply and supply-secure markets are not easily accessible.

The villages of Tissi, Dankui, and Baré are all located in typically surplus regions of the country. Tissi and Dankui are both served by neighboring bush markets while the villagers in Baré have access to markets along the route to Gaoua as well as a market in the village itself. It is also served by the large regional market in Bobo-Dioulasso.

Cultivation activities range from predominately millet production in the northern villages to a diversity of cereal and cash crops being produced in Baré. These differences suggest that a regionalized analytical approach may be necessary when addressing the question of farmer response and the potentials available for increasing marketed surplus in Burkina Faso. This will become clearer as we look at each village's economic situation over the one-year period extending from December 1983 through November 1984.

## CHAPTER FOUR

### DESCRIPTION OF THE ECONOMIC POSITION OF SAMPLE VILLAGES

We would now like to present a descriptive analysis of farm household behavior in the sample villages for the one year period of December 1983 to November 1984.

The CRED/IAP cereal grain marketing project collected data on sales and purchasing patterns of farmers in addition to data on the consumption, storage, harvest, and exchange behavior of farmers in the Yatenga, Volta Noire, and Hauts-Bassins regions of Burkina Faso.

We will begin first with a description of farmer cereal selling behavior for the one year period defined above. Throughout the subsequent analysis cereals will refer to an aggregate measure of red sorghum, white sorghum, millet, fonio, maize, rice, and food aid. The food aid cereal grains came in two (2) forms--sorghum from the United States and maize from Catholic Relief Services.

#### 4.1 CEREAL GRAIN DISPOSITION: ANNUAL CEREAL GRAIN SALES

A wide range of cereal grain sales behavior is exhibited by the farmers in the sample villages. The volume of cereal grains sold ranges from 30,001.3 kilograms sold in the village of Baré to 75.16 kilograms sold in the northern village of Bougouré (see Table 4.1). It is, however, difficult to make an accurate assessment of selling behavior by examining figures at such an aggregated level.

We have, therefore, calculated a measure of the total volume of cereal grain sales per consumer equivalent in each village (see Table 4.2). We still find that Baré accounts for the largest volume of cereal sales per consumer equivalency unit.\* In this village 84.09 kilograms per consumer unit were sold; while Bougouré's sales of .27 kilograms per consumer equivalency unit (CEU) were minimal (see Table 4.3).

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\*For an explanation of the construction of the consumer equivalency units see Appendix 1.

TABLE 4.1					
YEARLY GROSS SALES OF CEREAL GRAINS ALL CROPS AGGREGATED DECEMBER 1983 TO NOVEMBER 1984					
	Gross Sales (KG)				
	N	SUM	MEAN	STD	PCTSUM
<u>VILLAGE</u>					
Mené	7.00	1,175.15	167.88	170.11	3.48
Bougouré	6.00	75.16	12.53	12.69	0.22
Baré	47.00	30,001.30	638.33	1,307.35	88.76
Tissi	24.00	2,042.90	85.12	116.33	6.04
Dankui	3.00	505.64	168.55	147.97	1.50
All	87.00	33,800.20	388.51	997.83	100.00
NOTES: N = number of observations SUM = village total in kilograms MEAN = village average STD = standard deviation PCTSUM = percentage sum					
University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.					

TABLE 4.2  
TOTAL VILLAGE CEREAL GRAIN SALES PER CONSUMER  
EQUIVALENCY UNIT (KG/CEU)

Village	Village Sales/CEU*
Mené	4.64 (1.87)**
Bougouré	.265
Baré	84.09
Tissi	8.36
Dankui	2.49

NOTES: \*Sum of all household cereal grain sales in the village/Total number of consumer equivalency units in the village.

\*\*With Maize traders removed.

University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.

TABLE 4.3 TOTAL NUMBER OF CONSUMER EQUIVALENCY UNITS IN EACH VILLAGE	
VILLAGE	VCEQ*
Mené	253.20
Bougouré	283.53
Baré	356.77
Tissi	244.51
Dankui	202.80

NOTE: \*VCEQ: total number of consumer equivalency units.

University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.

The village with the second largest total volume of cereal sales was Tissi with 2042.9 kilograms sold by Tissi sample farm households within the year. In this village, 8.36 kilograms per CEU were sold. It is interesting to note the relatively large difference in cereal sales volume between Baré (the largest volume seller) and Tissi (the second largest volume seller) which is also located in a generally surplus area of the country. This suggests that even within the surplus region there may be a large variation in the selling behavior exhibited by Burkinabé farmers. Baré has sold in the same one year period more than ten (10) times the volume of cereals sold in Tissi. Dankui, another village in a surplus area of Burkina, sold only 505.64 kilograms of cereal grains. Expressed in consumer equivalency units this becomes 2.49 kilograms per CEU.

The two villages which accounted for the largest volumes of cereal grains being sold also had the largest percentage of participants in the marketing process. Virtually all (94%) of the farmers in Baré sold some amount of cereal grains. In Tissi, 60 percent of the households sold cereal grains. A relatively small number of farmers in Dankui sold cereal grains, with only 7.1 percent of the sample selling cereal grains. Higher participation in cereal grain sales was found in the northern villages of Mené (15.9%) and Bougouré (14.3%). In explanation of Dankui's low volume of cereal grain sales we hypothesize that since Dankui is a village where a large volume of cotton is grown and sold the farmers' cash needs are being met through sales of cotton. This may explain in part the low volume of cereal sales and marketing activity in this village.

We would now like to identify the cereal grains being sold by those who participate in marketing activities in these villages (see Table 4.4).

Baré, located twenty-five (25) kilometers from the dolo brewing center of Bobo-Dioulasso, sells the largest volume of red sorghum the cereal grain used in brewing dolo. Red sorghum is also the largest volume crop harvested in Baré. This suggests that farmers may be responsive to the surrounding potential markets for their crops. Of course, red sorghum is also consumed by these farmers but in much smaller amounts relative to the other cereal grains. Red sorghum sales represent

TABLE 4.4  
 YEARLY GROSS SALES OF CEREAL GRAINS  
 ALL CROPS DISAGGREGATED  
 DECEMBER 1983 TO NOVEMBER 1984

		Gross Sales (KG)				
		N	SUM	MEAN	STD	PCTSUM
<u>VILLAGE</u>	<u>CROP</u>					
Mené	REDSOR	0.00	0.00	0.00	0.00	0.00
	WHTSOR	2.00	32.40	16.20	0.00	0.10
	MILLET	4.00	403.55	100.89	94.88	1.19
	MAIZE	2.00	700.00	350.00	212.13	2.07
	RICE	1.00	39.20	39.20	0.00	0.12
	CRS*	0.00	0.00	0.00	0.00	0.00
	USSORG*	0.00	0.00	0.00	0.00	0.00
Bougouré	REDSOR	0.00	0.00	0.00	0.00	0.00
	WHTSOR	5.00	40.26	8.05	8.36	0.12
	MILLET	1.00	27.90	27.90	0.00	0.08
	MAIZE	0.00	0.00	0.00	0.00	0.00
	RICE	1.00	7.00	7.00	0.00	0.02
	CRS*	0.00	0.00	0.00	0.00	0.00
	USSORG*	0.00	0.00	0.00	0.00	0.00
Baré	REDSOR	46.00	21,509.70	467.60	700.01	63.64
	WHTSOR	13.00	4,523.32	347.95	556.19	13.38
	MILLET	6.00	445.85	74.31	69.35	1.32
	MAIZE	14.00	3,463.72	247.41	252.76	10.25
	RICE	2.00	58.80	29.40	13.86	0.17
Tissi	REDSOR	8.00	1,085.44	135.68	146.98	3.21
	WHTSOR	13.00	457.69	35.21	28.98	1.35
	MILLET	6.00	297.70	49.62	54.17	0.88
	MAIZE	0.00	0.00	0.00	0.00	0.00
	RICE	3.00	202.07	67.36	96.98	0.60
Dankui	REDSOR	1.00	144.00	144.00	0.00	0.43
	WHTSOR	3.00	361.64	120.55	74.84	1.07
	MILLET	0.00	0.00	0.00	0.00	0.00
	MAIZE	0.00	0.00	0.00	0.00	0.00
	RICE	0.00	0.00	0.00	0.00	0.00
All		131.00	33,800.20	258.02	490.24	100.00

NOTES: \*CRS = Catholic Relief Services Food Aid/USSORG = U.S. Sorghum Food Aid

N = number of households  
 SUM = village total in kilograms  
 MEAN = village average  
 STD = standard deviation  
 PCTSUM = percentage sum

71.69 percent of all cereal grain sales in Baré. This cereal is also the largest volume cereal grain sold in Tissi as well, with 53.1 percent of all sales by Tissi farmers being red sorghum. In Dankui, both red and white sorghum were sold. The farmers in this village sold a larger volume of white sorghum (71.5% of cereal grains sold in Dankui). Maize is the largest volume seller in Mené, followed by millet. In Mené, the maize was sold by farmers engaging in small-scale grain trade. The maize was brought north from Ghana and purchased and sold by a few farmer/traders residing in Mené (May, 1985, pg. 76). In Bougouré, the only crops sold were millet and white sorghum and these were sold in very small quantities; 27.90 kilograms and 40.26 kilograms respectively.

If we look at the participation in the selling of cereal grains by cereal we see that there are typically a small number of sellers for each crop. This is true for all crops with the exception of red sorghum in Baré. In this case, 90 percent of the households engaged in the sale of red sorghum. The second largest percentage (32.5%) of farmers engaged in the sale of one specific crop is the group of farmers in Tissi who sold white sorghum.

In general, however, we are seeing a small number of sellers per volume sold with the exception of red sorghum in Baré and white sorghum in Tissi village (see Table 4.5). Although few people participated in the marketing of cereal in Dankui almost one-half of the sample (47.6%) gave cereal grains as gifts or in exchange for services. Constance McCorkle, details the importance of these exchanges in her report (see Volume III, Research Report No.1). According to McCorkle, grain is being exchanged for dolo, milk, labor, and for other cereal grains. Participation in this segment of the village economy is the highest in Tissi (87.5%).

#### 4.2 CEREAL GRAIN DISPOSITION: AMOUNTS GIVEN

The disposal of grain through non-market channels plays a significant role in the farm household economy. The volume of cereal grains which was given as gifts or in exchange for labor and other services in all

TABLE 4.5 PERCENTAGE OF HOUSEHOLDS PARTICIPATING IN THE SELLING OF CEREAL GRAINS		
Village	% of Participants	Rank
Mené	15.00 (9%)*	3**
Bougouré	14.30	4
Baré	94.00	1
Tissi	60.00	2
Dankui	7.10	5

NOTES: \*Percentage calculated based on cereal grain sales with maize traders removed.

\*\*Rank using the participant percentage calculated when maize traders are removed.

University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.

villages represented 17578.9 kilograms. This is equivalent to 53.2 percent of the total volume of cereals sold (see Table 4.6).

Participation in this disposal activity was higher than sales participation in all villages except Baré (see Table 4.7). This illustrates the potential social and economic importance of cereal exchanges and gifts in villages where the grain market participation rate is low. Cereal grains are still being moved between households without involvement in the market.

In Bougouré, the village with the lowest number of sellers, we find 40.5 percent of the households providing grain through the exchange network. Almost three (3) times the number of households gave grain in exchanges/gifts as did households who sold. In volume terms, almost eight (8) times the volume of grain sold was disposed of in this manner. Approximately 597 kilograms were given as gifts or bartered, while only 75.16 kilograms were sold.

The average annual volume of amounts given per participating household in Bougouré was 35.15 kilograms, as compared to an average annual volume of 416.93 kilograms per transacting household in Tissi. The farming households in Mené who distributed cereal grains at an average level which closely approximated that of the other deficit region village, Bougouré. The mean kilogram volume per transacting household was in this case 39.64 kilograms. Finally, Dankui's village total volume was 1913.03 kilograms with an average of 95.65 kilograms per participating household (see Table 4.6).

The farmers in Baré have not reported in our surveys any participation in exchange expenditure transactions. This observation seemed highly suspect to us and upon closer examination of the data we found that gifts were often given in the form of cash or consumer goods such as cigarettes. A more in-depth study of the composition of amounts given would be valuable. However, it may be hypothesized that cash and consumer goods are a highly valued form of gift giving in a village where cereal grain food security is less of a concern.

The relative importance of cereal grain sales and the amounts of grain exchanged or given away can be analyzed by looking at the percentage of harvest that each dispositional activity accounts for on a

TABLE 4.6  
 YEARLY AMOUNTS OF CEREAL GRAINS GIVEN  
 ALL CROPS AGGREGATED  
 DECEMBER 1983 TO NOVEMBER 1984

	Amounts Given (KG)				
	N	SUM	MEAN	STD	PCTSUM
<u>VILLAGE</u>					
Mené	12.00	475.70	39.64	52.21	2.71
Bougouré	17.00	597.57	35.15	37.22	3.40
Baré	0.00	0.00	0.00	0.00	0.00
Tissi	35.00	14,592.60	416.93	528.87	83.01
Dankui	20.00	1,913.03	95.65	109.07	10.88
All	84.00	17,578.90	209.27	386.77	100.00

NOTES: \*Data collected for a five-month period beginning July 1984 and ending November 30, 1984

N = number of households  
 SUM = village total in kilograms  
 MEAN = village average  
 STD = standard deviation  
 PCTSUM = percentage sum

TABLE 4.7  
 PERCENTAGE OF HOUSEHOLDS PARTICIPATING IN GIFT  
 GIVING AND IN-KIND EXPENDITURE ACTIVITIES

Village	% of Participants	Rank
Mené	27.20	4
Bougouré	40.50	3
Baré*	0.00	5
Tissi	87.50	1
Dankui	47.60	2

NOTE: \*Data collected for a five-month period starting July 1984 and ending November 30, 1984.

University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.

village level basis. In three out of the five villages the volume of cereals given/exchanged as a percentage of harvest exceeds that of the volume of sales taken as a percentage of harvest. The case of Tissi is particularly interesting as the amounts given/exchanged are 68.68 percent of the volume harvested in the village, whereas sales represent less than 10 percent of the harvest in Tissi (see Tables 4.8 and 4.9). In Dankui, another village located in the typically surplus region of the Volta Noire, cereal sales accounted for a smaller percentage of harvest than cereal grains used in gift/exchange transactions. The equivalent of 10.28 percent of the harvest volume was distributed in this manner. These transactions represent 3.78 times the volume of cereal grains sold.

Bougouré is the third village where the volume of grains given/exchanged as a percentage of harvest exceeded that of the cereal grains sold/harvest. Baré and Mené exhibit a trend in the opposite direction. If, however, in Mené, we remove those cereal grain sales in maize which were not representative of own-production marketing behavior we find that the volume of grains exchanged/harvest is exactly equal to the volume of sales/harvest or 1.27 percent. In Baré, the equivalent of 14.7 percent of the harvest was sold, and as stated previously no gifts or exchanges of cereal were reported.

This later fact is refutable. It is highly likely that these transactions did occur in at least small amounts but went unreported or reported as dolo. Dolo, is the local beer which is produced from red sorghum. It is used for many purposes, including as a payment for services and as a means to maintain goodwill between friends or establish goodwill between new associates. Sales in Baré, nevertheless, represented the largest percentage of harvest in any of the five villages.

The ranking of these villages in three categories; on the volume of cereal grains sold, the volume sold per consumer equivalency unit, and on the volume of sales as a percentage of harvest is the same in all cases. This suggests that as the harvest increases the volume of cereals sold as a percentage of harvest will also increase. In summary, the village with the largest volume of sales and the largest volume of sales per consumer unit is also the village with the largest volume of sales as a percentage of harvest. This trend continues in the ranking of all five villages (see Table 4.10).

TABLE 4.8	
PERCENTAGE OF HARVEST ACCOUNTED FOR BY GIFTS GIVEN/TRANSFERS OF CEREAL GRAINS	
Village	Percentage
Mené	1.27
Bougouré	7.45
Baré*	0.00
Tissi	68.68
Dankui	10.28
NOTE: *Data collected for a five-month period starting July 1984 and ending November 30, 1984.	
University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.	

TABLE 4.9 PERCENTAGE OF HARVEST ACCOUNTED FOR BY SALES OF CEREAL GRAINS	
Village	Percentage
Mené	3.14 (1.27)*
Bougouré	.94
Baré	14.17
Tissi	9.61
Dankui	2.72
NOTE: *Without maize.	
University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.	

TABLE 4.10  
RANKINGS OF VILLAGES ON THREE  
MEASURES OF CEREAL GRAIN DISPOSAL BEHAVIOR

Village	Volume of Sales	Volume of Sales/CEU	Volume/Harvest
Mené	4*	4*	4*
Bougouré	5	5	5
Baré	1	1	1
Tissi	2	2	2
Dankui	3	3	3

NOTE: \*Rank using the figures which removed maize traders in Mené.

In the ranking of the villages on the basis of the volume of cereal grains used in exchange transactions a similar relationship to that stated above for sales does not emerge. Baré, as previously noted, reports no participation in this activity, hence, the village with the largest harvest has the smallest percentage of cereal grains given per harvest (0%). In general, however, we can say that cereal grains disposed of in non-market transactions assume a larger proportion of harvest in the surplus areas than in the deficit area (with the exception of Baré).

#### 4.3 CEREAL GRAIN DISPOSITION: CONSUMPTION

As a preface to the descriptive analysis to be performed on the consumption data collected; a few qualifications must be made. First, Baré, which was the fifth village to be added to the sample, has consumption data recorded only for a five (5) month period beginning in July 1984. This period coincided largely with that of the soudure or hungry period in Burkina Faso. Data on consumption prior to this time is unavailable. Therefore all figures reported are for this six (6) month period. Second, we feel that because of the multitude of social and economic factors, the consumption data may be among the least accurate reports of farmer cereal grain utilization. Keeping these factors in mind, one can proceed with an examination of consumption patterns in each village.

A measure of consumption equivalents was calculated for each individual in the village and aggregated first over decision units and second over villages. The weights which were assigned to individuals are shown in Appendix 1 in addition to a more complete explanation of the consumption equivalent measure (see Appendix 1).

Consumption of cereal grains per consumer unit were then calculated for the four (4) original villages and an approximation was made for the six (6) month period in which consumption was monitored in Baré. Annual consumption per consumer equivalency unit was the highest in the village of Mené where 364.3 kilograms per CEU was calculated (see Table 4.11). The consumption per CEU estimated for Baré is 294.5 kilograms. Tissi is the village ranked third in cereal grain consumption. In this village

TABLE 4.11	
YEARLY CONSUMPTION OF CEREAL GRAINS PER CONSUMER EQUIVALENCY UNIT (KG/CEU)	
Village	Consumption/CEU*
Mené	364.3
Bougouré	154.07
Baré	= 294.32
Tissi	251.12
Dankui	196.57
<p>NOTES: *The total volume of cereal grains consumed in the village/total number of consumer equivalency units in each village.</p> <p>**An approximation based on figures for a six month period.</p>	
University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.	

the annual average volume consumed was 251.12 kilograms per consumer equivalency unit. Dankui's consumption is 196.57 kilograms per consumer equivalency unit and Bougouré's is 154.07 kilograms/CEU.

One consumption equivalency unit is equal to a male over the age of 16 who has been present in household for the full one period (12 months). The appropriate kilogram equivalencies in consumption for the remaining categories of consumer units can be calculated by multiplying the consumption equivalency weight for the appropriate age and sex group by the estimated consumption/CEU in each village (see Appendix 1).

The composition of cereal grain consumption reflects preferences in tastes for grain. These tastes vary from village to village depending upon taste, cereal grain availability, choices made in production, and marketing options. The cereal of preference in Mené is millet where 63 percent of all cereal grains consumed was in the form of millet. Virtually all of the farming households in Mené consumed millet and white sorghum which represented 28.9 percent of the cereal grain consumed in Mené. Notably, only one household was recorded as having consumed U.S. sorghum food aid (see Tables 4.12 and 4.13).

Consumption patterns in Bougouré show the reverse of those in Mené with white sorghum being consumed in the largest volume. The mean annual total consumption in Bougouré was 632.8 kilograms per household. Millet consumption was secondary in terms of the volume consumed but its frequency of consumption (number of households consuming millet) was virtually equivalent to that of white sorghum.

In the province of Hauts-Bassins we see a strong pattern for the consumption of white sorghum in the village of Baré. In the six month period of examination, the average consumption of white sorghum was 374.94 kilograms per household. All of the farm households consumed some quantity of both white sorghum and maize. The second cereal of preference for this period was maize, followed by millet, and finally by red sorghum. The consumption of maize is a reflection of the period in which the data was collected which included the hungry and the harvest periods. During the early harvest period is when most maize is consumed, as it is the first cereal grain to be harvested. It does not store for long periods of time and thus it is often directly consumed from the

TABLE 4.12  
 YEARLY CEREAL GRAIN CONSUMPTION  
 ALL CROPS AGGREGATED  
 DECEMBER 1983 TO NOVEMBER 1984

	Consumption (KG)				
	N	SUM	MEAN	STD	PCTSUM
<u>VILLAGE</u>					
Mené	44.00	92,242.30	2,096.42	1,941.61	31.55
Bougouré	43.00	43,747.10	1,017.37	549.73	14.96
Baré*	51.00	52,537.70	1,030.15	930.36	17.97
Tissi	41.00	63,948.80	1,559.73	1,047.79	21.87
Dankui	42.00	39,866.60	949.21	522.45	13.64
All	221.00	292,343.00	1,322.80	1,198.59	100.00

NOTES: \*Consumption for the six-month period beginning June 1984 and ending November 1984.

N = number of households  
 SUM = village total in kilograms  
 MEAN = village average  
 STD = standard deviation  
 PCTSUM = percentage sum

University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.

TABLE 4.13

YEARLY CONSUMPTION OF CEREAL GRAINS: DISAGGREGATED BY CROP  
DECEMBER 1983 TO NOVEMBER 1984

CONSUMPTION (KG)		Red Sorghum	White Sorghum	Millet	Fonio	Maize	Rice	Cath. Relief Food Aid	US. Sorghum Food Aid	TOTAL
N**	Mené	5.00	43.00	43.00	0.00	28.00	0.00	0.00	1.00	
	Bougouré	3.00	42.00	40.00	0.00	10.00	0.00	0.00	2.00	
	Baré	43.00	48.00	43.00	0.00	49.00	0.00	0.00	0.00	
	Tissi	36.00	36.00	38.00	0.00	6.00	0.00	0.00	0.00	
	Dankui	37.00	41.00	39.00	0.00	17.00	0.00	0.00	0.00	
									652.00	
SUM	Mené	829.30	26,698.20	58,158.40	0.00	6,511.49	0.00	0.00	45.00	
	Bougouré	280.77	26,577.50	16,344.10	0.00	326.17	0.00	0.00	157.50	
	Baré	8,892.64	17,997.10	9,755.42	0.00	15,857.70	0.00	0.00	0.00	
	Tissi	24,747.60	23,946.60	12,523.00	0.00	184.22	0.00	0.00	0.00	
	Dankui	12,886.90	17,912.50	7,641.12	0.00	1,426.17	0.00	0.00	0.00	
									289,699.00	
MEAN*	Mené	165.86	620.89	1,352.52	0.00	232.55	0.00	0.00	45.00	
	Bougouré	93.59	632.80	408.60	0.00	32.62	0.00	0.00	78.75	
	Baré	206.81	374.94	226.87	0.00	323.63	0.00	0.00	0.00	
	Tissi	687.43	630.17	329.55	0.00	30.70	0.00	0.00	0.00	
	Dankui	348.29	436.89	195.93	0.00	83.89	0.00	0.00	0.00	
									444.32	
STD**	Mené	135.10	653.34	1,578.17	0.00	334.99	0.00	0.00	0.00	
	Bougouré	71.56	398.90	263.16	0.00	45.40	0.00	0.00	15.91	
	Baré	207.81	412.47	377.73	0.00	289.30	0.00	0.00	0.00	
	Tissi	996.24	450.42	301.58	0.00	27.91	-0.00	-0.00	0.00	
	Dankui	316.03	352.35	189.45	0.00	87.16	-0.00	-0.00	0.00	
									641.84	
PCT-SUM**	Mené	0.29	9.22	20.08	0.00	2.25	-0.00	-0.00	0.02	
	Bougouré	0.10	9.17	5.64	0.00	0.11	-0.00	-0.00	0.05	
	Baré	3.07	6.21	3.37	0.00	5.47	-0.00	-0.00	0.00	
	Tissi	8.54	8.27	4.32	0.00	0.06	-0.00	-0.00	0.00	
	Dankui	4.45	6.18	2.64	0.00	0.49	-0.00	-0.00	0.00	
									100.00	

NOTES: \*Rounded to the nearest whole number

\*\*N = number of households STD = Standard deviation PCTSUM = percentage SUM

\*\*\*Due to rounding of the mean the percentage sum over all villages sums to 101.

University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.

field in a roasted form. In Baré, each cereal grain was consumed by at least 86 percent of the households.

The strong preference for maize consumption was much less pronounced in the village of Tissi where only 184.22 kilograms of maize were consumed. Red and white sorghum consumption represent 40.3 percent and 39 percent respectively of all cereals consumed in Tissi. In Dankui consumption patterns are little different as 77.3 percent of consumption is composed of these two cereal grains. A difference between the two villages is evident when one looks at maize consumption. Dankui consumed almost eight (8) times the volume of maize consumed in Tissi, yet maize still only played a minor role in cereal grain consumption in Dankui (3.6% of the food grains consumed).

The position of farm households with regards to consumption and production patterns can provide us with insights into the ability of farmers to meet their food needs through own-production and hence insights into the allocational choice of farmers among home consumption sales and exchanges of cereals.

It is clearly the case that farmers in four (4) of the villages consume more than they produce. This same conclusion cannot be made for Baré due to the unavailability of data. The farm households consume, in all cases, more than twice the amount which they produce and in Bougouré consumption exceeds production fivefold based on the aggregate village figures (see Table 4.14). The largest difference in consumption and harvest may be a reflection of the low 1983-84 harvest which resulted from lack of timely rain in this area during the agricultural season. This phenomenon is also reflected in the remaining villages' figures for annual consumption/harvest as well. Nevertheless, it is evident that consumption exceeds production in even the surplus areas of the country.

The presence of food aid in the farm households' consumption patterns of cereal grains seems to be relatively unimportant in these villages. There are several reasons for this including the under-reporting of consumption of these cereals due to social pressures, and the redistribution of these lesser quality cereals in place of own-production. The purchases of food aid, however, was reported.

To continue in the description of the farm household economy in the sample villages, we will now turn to the examination of cereal grain

TABLE 4.14 CEREAL GRAIN CONSUMPTION AS A PERCENTAGE OF HARVEST	
Village	Village Consumption/Harvest*
Mené	2.47
Bougouré	5.45
Baré**	**
Tissi	2.89
Dankui	2.14
NOTES: *Total of cereal grain consumption in each village/total volume of cereal grains harvested. **Baré calculations cannot be made due to incomplete data set.	
University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.	

acquisitional behavior which includes the purchase of cereal grains and the receipt of grains in the form of gifts and payments in-kind.

#### 4.4 CEREAL GRAIN ACQUISITION: PURCHASES

Upon examination of the purchasing behavior of farmers in the Yatenga, Volta Noire, and Hauts-Bassins regions of Burkina Faso, one can conclude that in all regions the role of cereal grain purchases in the household economy is significant. The volume of cereal grains purchased exceeds the volume sold in all villages with the exception of Baré. This is also true if we look at volume of cereal grain sold per consumer equivalency unit.

The volume of cereals purchased in Mené exceeded that of the remaining four (4) villages; farm households in this village purchased 30,339.7 kilograms during the year. If we remove the maize which was purchased by small trader/farmers, the total volume sold was 29,639.7 kilograms or 117.06 kilograms/CEU (see Tables 4.15, 4.16, and 4.17). Millet was purchased by 95.45 percent of the sample households. The mean volume per purchasing household was 309.25 kilograms. The cereal grain which was consumed in the largest amount in Mené was also millet. More than four times (4.48) the volume of millet purchased was consumed by households in Mené. Of the total 26,639.7 kilograms purchased 43.8 percent of these cereal grains (excluding maize) were in the form of millet. The importance of white sorghum in consumption (it is ranked second) was also illustrated in the purchasing pattern of the villages. White sorghum represents the second largest volume of cereals purchased in Mené.

Food aid purchases in Mené are larger than the amount of food aid consumed which suggests that the food aid may later be redistributed through farmer participation in gift giving or exchange activities. The information regarding this possibility is not available at the present time. Purchases of U.S. sorghum food aid in Mené amounted to 2767.50 kilograms while consumption figures show 45.0 kilograms of the cereal consumed by sample members. Rice purchases were minimal (3.8%) in the acquisitional pattern of farm households.

TABLE 4.15  
 YEARLY GROSS PURCHASES OF CEREAL GRAINS  
 ALL CROPS AGGREGATED  
 DECEMBER 1983 TO NOVEMBER 1984

	Gross Purchases (KG)				
	N	SUM	MEAN	STD	PCTSUM
<u>VILLAGE</u>					
Mené	44.00	(26,639.70)* 30,339.70	689.54	502.19	29.28
Bougouré	41.00	18,419.60	449.26	360.70	17.78
Baré	45.00	15,107.10	335.71	391.82	14.58
Tissi	38.00	24,163.40	635.88	795.43	23.32
Dankui	40.00	15,575.50	389.39	377.65	15.03
All	208.00	103,605.00	498.10	519.01	100.00

NOTES: \*Gross purchases with maize removed.

N = number of households  
 SUM = village total in kilograms  
 MEAN = village average  
 STD = standard deviation  
 PCTSUM = percentage sum

TABLE 4.16	
THE VOLUME OF CEREAL GRAINS PURCHASED PER CONSUMER EQUIVALENCY UNIT	
Village	Purchases/CEU*
Mené	119.88 (117.06)**
Bougouré	64.97
Baré	42.34
Tissi	98.82
Dankui	76.80

NOTES: \*Total volume of cereal grains purchased in each village/total number of consumer equivalency units.  
 \*\*With maize traders removed.

University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.

TABLE 4.17  
 YEARLY GROSS PURCHASES OF CEREAL GRAINS  
 ALL CROPS DISAGGREGATED  
 DECEMBER 1983 TO NOVEMBER 1984

		Gross Purchases (KG)				
		N	SUM	MEAN	STD	PCTSUM
<u>VILLAGE</u>	<u>CROP</u>					
Mené	REDSOR	6.00	432.84	72.14	77.36	0.42
	WHTSOR	40.00	8,493.02	212.33	148.96	8.20
	MILLET	42.00	12,988.60	309.25	379.42	12.54
	MAIZE	33.00	4,444.71	134.69	130.28	4.29
	RICE	31.00	1,032.97	33.32	42.46	1.00
	CRS*	3.00	180.00	60.00	25.98	0.17
	USSORG*	22.00	2,767.50	125.80	75.64	2.67
Bougouré	REDSOR	2.00	59.01	29.50	5.96	0.06
	WHTSOR	39.00	9,347.79	239.69	259.11	9.02
	MILLET	9.00	461.60	51.29	46.64	0.45
	MAIZE	12.00	305.75	25.48	26.39	0.30
	RICE	24.00	302.92	12.62	22.37	0.29
	CRS*	16.00	1,845.00	115.31	46.38	1.78
	USSORG*	35.00	6,097.50	174.21	130.21	5.89
Baré	REDSOR	29.00	7,549.02	260.31	248.30	7.29
	WHTSOR	16.00	2,068.59	129.29	117.91	2.00
	MILLET	10.00	738.75	73.88	52.50	0.71
	MAIZE	10.00	430.76	43.08	32.94	0.42
	RICE	37.00	4,320.01	116.76	265.32	4.17
Tissi	REDSOR	26.00	8,765.66	337.14	499.48	8.46
	WHTSOR	30.00	11,802.30	393.41	529.39	11.39
	MILLET	17.00	1,394.96	82.06	107.36	1.35
	MAIZE	8.00	189.95	23.74	12.95	0.18
	RICE	33.00	2,010.59	60.93	81.58	1.94
Dankui	REDSOR	33.00	5,344.10	161.94	199.03	5.16
	WHTSOR	38.00	8,597.39	226.25	225.77	8.30
	MILLET	13.00	1,000.63	76.97	90.79	0.97
	MAIZE	9.00	543.20	60.36	57.70	0.52
	RICE	14.00	90.17	6.44	9.98	0.09
All		637.00	103,605.00	162.65	251.96	100.00

NOTES: \*CRS = Catholic Relief Food Aid/USSORG = U.S. Sorghum Food Aid.

N = number of households  
 SUM = village total in kilograms  
 MEAN = village average  
 STD = standard deviation  
 PCTSUM = percentage sum

The purchasing pattern in Tissi is also reflective of consumption patterns in that village. Approximately 48 percent of the cereal grains purchased in Tissi was in the form of white sorghum which was consumed by 95 percent of the households. White sorghum is a staple preferred grain for consumption as 39 percent of the food grains consumed was in the form of white sorghum. Of equal importance in consumption was red sorghum (40.3%). The annual mean volume of red sorghum per purchasing household was 337.14 kilograms as compared to the annual mean volume of white sorghum purchases of 393.41 (see Table 4.17). Red sorghum ranked second in cereal grain purchases in Tissi; the village with the second largest volume of cereal grain purchases recorded. The volume of cereals purchased per consumer equivalency unit is 98.82 kilograms in Tissi.

The ranking of the remaining villages in terms of total volume of cereal purchased and the volume purchased per CEU is as follows; Bougouré is ranked third in total volume purchased and fourth in purchased volume per consumer equivalency unit, Dankui is fourth in total volume of cereal purchased and changes places with Bougouré to become third in the volume per CEU purchased, Baré is ranked last in both categories. It should be noted that the village (Baré) with the largest total volume of sales had the smallest total volume of purchases and the smallest volume of food grain purchases per consumer equivalency unit.

Baré's purchasing pattern did not, however, reflect its consumption behavior. The largest volume of cereal purchased was red sorghum and the consumption of red sorghum accounted for the smallest percentage of the total volume of cereal grains consumed. The percentage of farm households consuming red sorghum (86%) is larger than the percentage of households purchasing red sorghum (58%) which implies that the non-purchasing farm households either ate their own-production of red sorghum or the red sorghum was received in exchanges. The red sorghum which was purchased could have been used for consumption or for dolo brewing. Research to be performed later will reveal if this sorghum was purchased, as is hypothesized, in large part by women who were brewing dolo. Field observations suggest that this may be true, and that a smaller percentage of purchased red sorghum was used for consumption.

The cereal grain purchasing patterns in Bougouré and Dankui followed consumption patterns as they did in Mené and Tissi. Consumption of white

sorghum in Bougouré takes place in every household and 92.8 percent of the households purchased this cereal grain. The mean volume of white sorghum purchases in Bougouré was the highest of all cereal grains at 239.69 kilograms. This was followed by purchases of U.S. sorghum which was not consumed in an equivalent volume in Bougouré. Dankui's farming households consumed and purchased the largest volume of white sorghum in comparison to all the remaining grains. Red sorghum purchases in total and mean volume per purchasing household fall second to those of white sorghum. This grain was purchased by 78.6 percent of all households and consumed by 88 percent. The participation of farm households in the purchasing of food grains was very high in all villages. In virtually all of the villages participation was close to 100 percent (see Table 4.18).

#### 4.5 CEREAL GRAIN ACQUISITIONS: AMOUNTS RECEIVED

The transfer of cereal grains between households within and between villages is the result of gift giving and receiving, and payments for and receipts of grain for services rendered. The volume of cereal grains received in the sample villages is slightly lower than that given although the number of recipients (109) exceeds the number of distributors (84) for the sample as a whole. The percentage of households that received grain in three of the villages (Tissi, Bougouré, and Mené) was 50 percent or greater while approximately 30 percent of the farm households in the remaining two villages (Baré, Dankui) were recipients of grain transfers.

We can see by looking at Table 4.19 that 61.46 percent of all of the grain received in the entire sample was acquired by the villagers of Tissi who also provided the largest amount of cereal grain outflows in the form of transfers. In the case of amounts given, the villagers of Tissi dispensed 83.01 percent of all food grains given away in the entire sample.

The volume of grains received was more than one third of the volume of grains consumed in Tissi. Seventy-five (75) percent of the sample in Tissi received grains and the village mean for recipient households was

TABLE 4.18 PERCENTAGE OF HOUSEHOLDS PARTICIPATING IN THE PURCHASING OF CEREAL GRAINS		
Village	% of Participants	Rank
Mené	100.00	1
Bougouré	97.60	2
Baré	90.00	5
Tissi	95.00	4
Dankui	95.20	3

University of Michigan. The Dynamics of Grain Marketing in Burkina Faso, 1986.

TABLE 4.19  
 YEARLY AMOUNTS OF CEREAL GRAINS RECEIVED  
 ALL CROPS AGGREGATED  
 DECEMBER 1983 TO NOVEMBER 1984

	Amounts Received (KG)				
	N	SUM	MEAN	STD	PCTSUM
<u>VILLAGE</u>					
Mené	22.00	1,817.16	82.60	106.30	12.62
Bougouré	28.00	1,893.91	67.64	103.33	13.16
Baré*	15.00	1,246.56	83.19	79.40	8.66
Tissi	30.00	8,847.24	294.91	384.67	61.46
Dankui	14.00	591.26	42.23	46.33	4.11
All	109.00	14,396.10	132.07	236.63	100.00

NOTES: \*Represents data collected during the period of July 1984–November 1984.

N = number of households  
 SUM = village total in kilograms  
 MEAN = village average  
 STD = standard deviation  
 PCTSUM = percentage sum

294.91 kilograms. In terms of the gross volume of cereal grains received, the villages can be ranked (in descending order) as follows: 1) Tissi, 2) Bougouré, 3) Mené, 4) Dankui. No difference is obtained if we rank the villages on the basis of the percentage of sample members who received these cereal grains.

We are unable to make comparisons using the data from Baré because the volume figures shown represent data collected for a five month, rather than one year period, beginning in July of 1984 and ending November 30, 1984. However, we are able to make a few observations. During this period 30 percent of the sample received cereal grains and the average volume of grain received was 83.1 kilograms. Considering that the period of data collection for the amount of grains received in Baré included the hungry season when one might expect that inter-household transfers of grain would be high and as a result the volume of grain received to be high. There is however, a relatively low rate of participation in this activity for the village of Baré.

The need for grains during this period is probably less in this village than in the other villages due to its surplus nature. The social obligation to give to less well-endowed households may be less binding in this case. This would be consistent with the finding that no cereal grains (although this absolutism is suspect) were given in gifts or exchanged and with the hypothesis that in a truly surplus situation consumer durables and cash become important alternatives to the inter-household transfer of cereals (see Table 4.20).

The total volume of amounts received per consumer equivalency unit shows that 36.18 kilograms per CEU were received in Tissi, 7.18 kilograms in Mené, 6.68 kilograms in Bougouré and 2.92 kilograms in Dankui (see Table 4.21). The ranking remains unchanged to that previously mentioned. The large volume of grain received and given in Tissi may be a reflection of the demographic composition of the village which is predominantly Moslem. Seasonal descriptions of disposal activities have been discussed by May who shows that the largest volume of cereal grains received and given away occur in November. He suggests that this peak is a reflection of the Islamic character of that village (see Volume III, Research Report No.2).

At this point, it will be appropriate to summarize the net position of each of the villages with regards to their cereal grain disposal and

TABLE 4.20  
 PERCENTAGE OF HOUSEHOLDS RECEIVING CEREAL GRAIN GIFTS  
 OR PAYMENTS IN-KIND

Village	% of Participants	Rank
Mené	50.00	3
Bougouré	66.67	2
*Baré	30.00	*
Tissi	75.00	1
Dankui	33.30	4

NOTE: \*Baré: data is available only for the month period beginning July, 1984 and continuing until November 30, 1984.

TABLE 4.21	
YEARLY AMOUNTS OF CEREAL GRAINS RECEIVED PER CONSUMER EQUIVALENCY UNIT (KG/CEU)	
Village	Amounts Received/CEU*
Mené	7.18
Bougouré	6.68
Baré **	**
Tissi	36.18
Dankui	2.92

NOTES: \*Total volume of cereal grains received in each village/total number of consumer equivalency units.  
\*\*Data unavailable for calculations.

University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.

acquisitional behavior patterns. We will look at two indicators: net sales and net amounts given.

#### 4.6 CEREAL GRAIN NET SALES AND NET AMOUNTS GIVEN

For purposes of this analysis net sales is defined as gross sales minus gross purchases of cereal grains. We have determined the position of each village on a measure of aggregate yearly cereal grain net sales and on a disaggregated level with the net sales of each cereal grain analyzed separately within a village.

We have found that over the one year study period, four of the villages have gross purchases larger than gross sales. Baré is the only village which shows cereal grain sales in excess of purchases and hence it is a surplus village from this vantage point. The mean value of net sales for Baré is 297.88 kilograms per household (see Table 4.22).

The village exhibiting the largest deficit in total volume, in total volume per household and in total volume per CEU is Mené. Purchases exceed sales by 28,465 kilograms.\* This of course does not imply that this village is in the worst position with regards to food self-sufficiency (although this may be true) as the farmers could be consuming a sufficient quantity of own-production. What can be said, however, is that cereal grain sales play a minor role in comparison to cereal grain purchases in this village.

There was no consistent pattern showing the deficit area villages as having a more negative net sales position than the surplus villages. Tissi showed the second largest negative net position with -90.47 kilograms/CEU. Net Sales/CEU in Mené is -115.19. The remaining village in the Volta Noire region, Dankui, shows net sales at -74.31 kilograms per CEU and Bougouré's position is one of the smallest negative difference between sales and purchases (-64.698 kg/CEU) (see Tables 4.23 and 4.24).

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\*Maize removed.

TABLE 4.22

YEARLY NET SALES OF CEREAL GRAINS  
ALL CROPS AGGREGATED  
DECEMBER 1983 TO NOVEMBER 1984

	Net Sales (KG)				
	N	SUM	MEAN	STD	PCTSUM
<u>VILLAGE</u>					
Mené	44.00	-(28,465.00) -29,165.00	-662.83	492.32	41.78
Bougouré	42.00	-18,344.00	-436.77	361.19	26.28
Baré	50.00	14,894.20	297.88	1,361.26	-21.34
Tissi	39.00	-22,121.00	-567.19	807.94	31.69
Dankui	40.00	-15,070.00	-376.75	379.34	21.59
All	215.00	69,805.00	-324.67	876.29	100.00

NOTES: N = number of households  
SUM = village total in kilograms  
MEAN = village average  
STD = standard deviation  
PCTSUM = percentage sum

TABLE 4.23	
THE VOLUME OF NET SALES OF CEREAL GRAINS PER CONSUMER EQUIVALENCY UNIT	
Village	Net Sales/CEU*
Mené	-115.19
Bougouré	-64.698
Baré	41.74
Tissi	-90.47
Dankui	-74.31

NOTE: \*Total volume of net sales in each village/total number of consumer equivalency units in each village.

University of Michigan. The Dynamics of Grain Marketing in Burkina Faso, 1986.

TABLE 4.24  
 YEARLY NET SALES OF CEREAL GRAINS  
 ALL CROPS DISAGGREGATED  
 DECEMBER 1983 TO NOVEMBER 1984

		Net Sales (KG)				
		N	SUM	MEAN	STD	PCTSUM
<u>VILLAGE</u>	<u>CROP</u>					
Mené	REDSOR	6.00	-432.84	-72.14	77.36	0.62
	WHTSOR	40.00	-8,460.60	-211.52	149.82	12.12
	MILLET	42.00	-12,585.00	-299.65	373.06	18.03
	MAIZE	33.00	-3,744.70	-113.48	91.99	5.36
	RICE	31.00	-993.77	-32.06	43.72	1.42
	CRS*	3.00	-180.00	-60.00	25.98	0.26
	USSORG*	22.00	-2,767.50	-125.80	75.64	3.96
Bougouré	REDSOR	2.00	-59.01	-29.50	5.96	0.08
	WHTSOR	40.00	-9,307.50	-232.69	256.06	13.33
	MILLET	10.00	-433.70	-43.37	50.60	0.62
	MAIZE	12.00	-305.75	-25.48	26.39	0.44
	RICE	24.00	-295.92	-12.33	22.18	0.42
	CRS*	16.00	-1,845.00	-115.31	46.38	2.64
	USSORG*	35.00	-6,097.50	-174.21	130.21	8.74
Baré	REDSOR	47.00	13,960.60	297.03	766.22	-20.00
	WHTSOR	26.00	2,454.73	94.41	467.08	-3.52
	MILLET	16.00	-292.90	-18.31	93.52	0.42
	MAIZE	23.00	3,032.96	131.87	244.37	-4.34
	RICE	37.00	-4,261.20	-115.17	265.26	6.10
Tissi	REDSOR	30.00	-7,680.20	-256.01	492.95	11.00
	WHTSOR	36.00	-11,345.00	-315.13	507.99	16.25
	MILLET	19.00	-1,097.30	-57.75	113.48	1.57
	MAIZE	8.00	-189.95	-23.74	12.95	0.27
	RICE	33.00	-1,808.50	-54.80	72.32	2.59
Dankui	REDSOR	33.00	-5,200.10	-157.58	203.81	7.45
	WHTSOR	38.00	-8,235.80	-216.73	226.02	11.80
	MILLET	13.00	-1,000.60	-76.97	90.79	1.43
	MAIZE	9.00	-543.20	-60.36	57.70	0.78
	RICE	14.00	-90.17	-6.44	9.98	0.13
All		698.00	-69,805.00	-100.01	345.35	100.00

NOTES: \*CRS = Catholic Relief Food Aid/USSORG = U.S. Sorghum Food Aid.

N = number of households  
 SUM = village total in kilograms  
 MEAN = village average  
 STD = standard deviation  
 PCTSUM = percentage sum

The evaluation of net amounts given or amounts given minus amounts received shows that the two deficit regions villages which exhibit negative net sales also exhibit negative net amounts given. In Mené, the net amounts per CEU was -5.29 kilograms per consumer equivalency unit and Bougouré's value is -4.57. In the surplus zone, of Volta Noire, both villages have positive net amounts given or the amount of cereals given exceeds that of cereal grains received. In Tissi the cereal amount given per CEU is 23.50 kilograms and Dankui's value is 3.6 times less at 6.52 kilograms per CEU (see Tables 4.25 and 4.26).

We will now give a brief summary of the harvest for 1983-84 and the stock of animals at the beginning of the study. The animal stocks are discussed because they are an important income generating alternative to cereal grain sales available to farm households.

#### 4.7 CEREAL GRAIN PRODUCTION: HARVEST

The relative position of each village with regards to production of cereal grains can be examined by looking at the figures for cereal grain harvest per consumer equivalency unit. The consumer equivalency unit in this case is used as a measure of household size. Since we are not addressing the question of productive potential it is felt that this measure, rather than producer equivalency units, is adequate for the descriptive analysis.

The mean harvest per household was highest in the village of Baré (2,775.57 kilograms/household) (see Table 4.27). Baré also has the largest value of production output per consumer equivalency unit (381.206 kilograms) (see Table 4.28). Mené's harvest was second in total volume and volume per CEU, the later being 147.39 kilograms per CEU. The harvest of cereal grains in Mené was approximately five times that of Bougouré. Both Dankui and Tissi have a value of total harvest per CEU that is within a ten kilogram range. The smallest difference in the volume of cereal grains harvested lies between these two villages located in the former Volta Noire.

An analysis of the volume harvested by crop in each village shows Mené harvesting the largest quantity of millet, followed by white

TABLE 4.25  
 YEARLY NET AMOUNTS OF CEREAL GRAINS GIVEN  
 ALL CROPS AGGREGATED  
 DECEMBER 1983 TO NOVEMBER 1984

	Net Amounts (KG)				
	N	SUM	MEAN	STD	PCTSUM
<u>VILLAGE</u>					
Mené	28.00	-1,341.50	-47.91	115.46	-42.15
Bougouré	31.00	-1,296.30	-41.82	105.67	-40.73
Baré*	15.00	-1,246.60	-83.10	79.40	-39.17
Tissi	39.00	5,745.37	147.32	469.73	180.51
Dankui	27.00	1,321.77	48.95	109.41	41.53
All	140.00	3,182.78	22.73	275.37	100.00

NOTES: \*Calculation of net amounts in Baré uses data for the period of July 1984–November 1984.

N = number of households  
 SUM = village total in kilograms  
 MEAN = village average  
 STD = standard deviation  
 PCTSUM = percentage sum

TABLE 4.26	
YEARLY NET VOLUME OF CEREAL GRAINS GIVEN PER CONSUMER EQUIVALENCY UNIT (KG/CEU)	
Village	Net Amounts/CEU*
Mené	-5.30
Bougouré	-4.572
Baré**	**
Tissi	23.50
Dankui	6.52
<p>NOTES: *Total volume of net amounts given in each village/total number of consumer equivalency units.</p> <p>**Data is unavailable for calculating a comparable measure for a one-year period.</p>	
University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.	

TABLE 4.27					
1983-1984 HARVEST ALL CROPS AGGREGATED					
	Harvest (KG)				
	N	SUM	MEAN	STD	PCTSUM
<u>VILLAGE</u>					
Mené	41.00	37,319.20	910.22	1,109.24	16.87
Bougouré	42.00	8,016.59	190.87	202.66	3.62
Baré	49.00	136,003.00	2,775.57	2,524.11	61.48
Tissi	38.00	21,247.10	559.13	835.38	9.61
Dankui	39.00	18,619.70	477.43	900.91	8.42
All	209.00	221,206.00	1,058.40	1,716.73	100.00
NOTES: N = number of households SUM = village total in kilograms MEAN = village average STD = standard deviation PCTSUM = percentage sum					
University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.					

TABLE 4.28 1983-84 HARVEST PER CONSUMER EQUIVALENCY UNIT (KG/CEU)		
Village	Harvest/CEU*	Rank
Mené	147.39	2
Bougouré	28.27	5
Baré	381.21	1
Tissi	86.90	3
Dankui	76.15	4

NOTE: \*Total village cereal grain harvest in kilograms/Total number of consumer equivalency units in the village.

University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.

sorghum. Bougouré shows the opposite ranking in volume of cereals harvested; the volume of white sorghum harvested is approximately twice that of millet (see Table 4.29).

In Baré, the cereal grain harvest is a reflection of marketing and consumption patterns. The preferred cereal grain for sales is red sorghum which also represents the largest volume of cereal grain harvested. White sorghum which is the preferred consumption grain is second in the volume of cereal grains harvested.

Consumption and marketing preferences for red sorghum in Tissi are consistent with the volume of red sorghum harvested in that village. The volume of red sorghum sold in Tissi is approximately 10% of the volume harvested. The harvest in Dankui, however, is less reflective of these patterns. A larger absolute volume of white sorghum was consumed and sold while the largest volume of cereal grains harvested was red sorghum. Because participation in the marketing of cereal grains in Dankui was so low (7%) it is difficult to make any statements concerning the relationship between output and sales behavior patterns. What we do find in Dankui, which was not present in the other four (4) villages, is a harvest of rice (78.4 kilograms). In this region, where the weather is more amenable to the production of rice, some households have diversified their production activities to include rice cultivation.

#### 4.8 STOCK OF CATTLE AND SMALL RUMINANTS

There are some commonalities which are present across regions when we examine the data on cattle stocks. The stock data which was used to perform this analysis was taken at the beginning of the study period. This census period was chosen because it was felt that the stocks held at this time would be representative of potential for alternative allocative activities of farm households for the period of analysis. In the northern region of the country the number of cattle (which is defined as bulls and cows) present in both villages is differs little. There are fifty-three cattle held by the sample households in Mené and fifty-six cattle in the village of Bougouré.

TABLE 4.29  
1983-1984 HARVEST  
ALL CROPS DISAGGREGATED

		Harvest				
		N	SUM	MEAN	STD	PCTSUM
<u>VILLAGE</u>	<u>CROP</u>					
Mené	WHTSOR	17.00	9,089.46	534.67	642.60	6.29
	MILLET	31.00	24,724.40	797.56	991.72	17.12
	MAIZE	1.00	7.85	7.85	0.00	0.01
Bougouré	WHTSOR	40.00	5,141.41	128.54	174.69	3.56
	MILLET	40.00	2,850.49	71.26	63.74	1.97
	MAIZE	1.00	7.85	7.85	0.00	0.01
Baré	REDSOR	13.00	23,731.80	1,825.52	1,695.02	16.43
	WHTSOR	14.00	17,985.90	1,284.71	967.18	12.45
	MILLET	9.00	9,976.50	1,108.50	1,477.54	6.91
	MAIZE	11.00	16,091.50	1,462.86	1,169.86	11.14
Tissi	REDSOR	17.00	10,393.70	611.39	972.00	7.20
	WHTSOR	9.00	2,526.35	280.71	263.51	1.75
	MILLET	15.00	5,068.70	337.91	315.04	3.51
Dankui	REDSOR	14.00	7,887.14	563.37	1,365.54	5.46
	WHTSOR	20.00	4,783.64	239.18	212.74	3.31
	MILLET	20.00	3,579.64	178.98	192.90	2.48
	MAIZE	4.00	496.60	124.15	87.58	0.34
	RICE	1.00	78.40	78.40	0.00	0.05
All		277.00	144,421.00	521.38	901.66	100.00

NOTES: N = number of households  
SUM = village total in kilograms  
MEAN = village average  
STD = standard deviation  
PCTSUM = percentage sum

The number of cattle in the Volta Noire region is double that of the Yatenga. The trend in cattle holdings is normally thought to be in the opposite direction. Typically, the northern region of the country has been cited as having a larger number of cattle per square kilometer. Although we do not have a comparable figure one might expect based on previously identified trends that a larger number of cattle would be found in the northern regions. It is possible, that the number of cattle in this region has been diminished significantly in the last few years due to the poor cereal grain harvests. When cereal grain harvests are poor farmers must rely more on the sale of animals and on remittances to meet their cash needs. We do not have inter-annual data on cattle stocks, however, so this hypothesis cannot be directly tested. We must also mention that the concentration of cattle per square kilometer may not, in general be as high in this area of the country as in the northernmost segments of Burkina Faso where the Peul herders reside.

The village of Baré has the largest number of cattle holdings. These holdings are about equally distributed between cows and bulls in all age categories (see Table 4.30). Cattle is a sign of wealth in addition to a provider of security for these farmers. They are rarely sold unless the farmers are faced with dire conditions.

Small ruminants, on the other hand, do provide a more easily liquidable asset in Baré. Baré is the village with the smallest number of small ruminants. We will look further into the reasons why this occurred at a later time. It can be hypothesized that the smaller number of ruminant holdings in Baré as compared to the northern region was due to a large number of ruminant sales in the previous year.

The 1982-83 harvest in Baré was not as abundant as that of previous years hence, the farmers could have sold their sheep and goats to meet their cash consumption needs. Due to the absence of inter-annual data on animal stocks we cannot examine this hypothesis. We may, however, identify the holders of small ruminants in our sample and then identify the characteristics of these farm households in order to determine the role of small ruminants as alternative cash-generating investments in each of the regions.

The composition of small ruminant holdings in Baré, (which includes both goats and sheep) is skewed towards goats as 68 percent of the small

TABLE 4.30

THE STOCK OF CATTLE - DISAGGREGATED BY SEX AND AGE: STOCKS AS OF FIRST CENSUS

		Bull 0-5 yrs.	Bull 5-10 yrs.	Bull 10+ yrs.	Cow 0-5 yrs.	Cow 5-10 yrs.	Cow 10+ yrs.	All	TOTAL ***
N**	Mené	6	4	0	5	3	0	18	138
	Bougouré	9	3	1	3	2	0	18	
	Bare	14	13	3	4	2	2	38	
	Tissi	12	4	4	6	6	1	33	
	Dankui	12	6	0	6	7	0	31	
SUM	Mené	9	23	0	12	9	0	53	478
	Bougouré	20	9	10	6	11	0	56	
	Bare	36	27	5	41	35	4	148	
	Tissi	39	14	9	17	22	9	110	
	Dankui	40	15	0	21	35	0	111	
MEAN*	Mené	2	6	0	2	3	0	3	3
	Bougouré	2	3	10	2	6	0	3	
	Bare	3	2	2	10	18	2	4	
	Tissi	3	4	2	3	4	9	3	
	Dankui	3	3	0	4	5	0	4	
STD**	Mené	1	10	0	2	3	0	5	4
	Bougouré	1	2	0	1	6	0	3	
	Bare	2	1	1	13	18	0	6	
	Tissi	3	1	2	2	2	0	2	
	Dankui	2	1	0	2	6	0	3	
PCT- SUM**	Mené	2	5	0	3	2	0	12	101
	Bougouré	4	2	2	1	2	0	11	
	Bare	8	6	1	9	7	1	32	
	Tissi	8	3	2	4	5	2	24	
	Dankui	8	3	0	4	7	0	22	

NOTES: \*Rounded to the nearest whole number

\*\*N = number of households STD = Standard deviation PCTSUM = percentage SUM

\*\*\*Due to rounding of the mean the percentage sum over all villages sums to 101.

University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.

ruminants held are goats. In Dankui, small ruminant holdings are about equally divided between goats and sheep. Tissi has approximately 100 more sheep and goats than either Baré or Dankui. As we proceed further north that trend is strengthened. Larger numbers of small ruminants are held and the composition of holdings is more representative of sheep than goats. Sheep comprise 64.8 percent of small ruminants held in Mené and 58.1 percent of the holdings in Bougouré (see Tables 4.31, 4.32 and 4.33).

TABLE 4.31  
PERCENTAGES OF SHEEP AND GOATS IN EACH VILLAGE

Village	Sheep(%)*	Goat(%)*	Total number of small ruminants
Mené	64.80	35.20	284
Bougouré	58.33	41.67	241
Baré	31.90	68.10	141
Tissi	56.30	43.70	238
Dankui	52.70	47.30	146

NOTE: \*Percentages of the total number of small ruminants held in each village.

University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.

TABLE 4.32

## THE STOCK OF SHEEP - DISAGGREGATED BY SEX AND AGE: STOCKS AS OF FIRST CENSUS

Sheep:	Lamb 0-1 yrs.	Lamb 1-2 yrs.	Ewe 2-5 yrs.	Ewe 5-10 yrs.	Ewe 10+ yrs.	Ram 2-5 yrs.	Ram 5-10 yrs.	Ram 10+ yrs.	All	TOTAL ***
N** Mené	25	23	14	0	0	3	3	0	68	186
Bougouré	4	2	13	2	0	20	1	0	42	
Baré	3	2	1	1	0	3	0	0	10	
Tissi	12	6	8	3	0	14	2	1	46	
Dankui	5	1	3	1	0	6	3	1	20	
SUM Mené	68	58	35	0	0	9	14	0	184	580
Bougouré	8	4	33	5	0	89	1	0	140	
Baré	13	12	4	3	0	13	0	0	45	
Tissi	35	18	19	14	0	39	6	3	134	
Dankui	36	1	11	1	0	20	7	1	77	
MEAN* Mené	3	3	3	0	0	3	5	0	17	94
Bougouré	2	2	3	3	0	4	1	0	15	
Baré	4	6	4	3	0	4	0	0	21	
Tissi	3	3	2	5	0	3	3	3	22	
Dankui	7	1	4	1	0	3	2	1	19	
STD** Mené	2	1	2	0	0	2	4	0	11	63
Bougouré	1	1	3	2	0	3	0	0	10	
Baré	3	0	0	0	0	4	0	0	7	
Tissi	4	3	2	6	0	2	1	0	18	
Dankui	9	0	4	0	0	2	2	0	17	
PCT-SUM** Mené	6	6	3	0	0	1	1	0	17	52
Bougouré	1	0	3	0	0	3	0	0	12	
Baré	1	1	0	0	0	1	0	0	3	
Tissi	3	2	2	1	0	4	1	0	13	
Dankui	3	0	1	0	0	2	1	0	7	

NOTES: \*Rounded to the nearest whole number

\*\*N = number of households    STD = Standard deviation    PCTSUM = percentage SUM

\*\*\*Due to rounding of the mean the percentage sum over all villages sums to 101.

TABLE 4.33

## THE STOCK OF GOATS - BY SEX AND AGE: STOCKS AS OF FIRST CENSUS

Goats:	Kid 0-1 yrs.	Kid 1-2 yrs.	Male Goat 2-5 yrs.	Male Goat 5-10 yrs.	Male Goat 10+ yrs.	Female Goat 2-5 yrs.	Female Goat 5-10 yrs.	Female Goat 10+ yrs.	All	TOTAL***
N**										
Mené	12	8	2	0	0	14	1	0	37	
Bougouré	1	2	7	1	1	16	0	0	26	
Bare	9	3	4	1	0	16	5	0	38	
Tissi	9	3	9	0	2	11	4	0	38	
Dankui	9	3	4	2	0	7	0	0	25	166
SUM										
Mené	27	18	3	0	0	50	2	0	100	
Bougouré	1	6	16	1	2	75	0	0	101	
Bare	26	6	6	1	0	44	13	0	96	
Tissi	29	12	18	0	11	28	6	0	104	
Dankui	26	8	9	5	0	21	0	0	69	470
MEAN*										
Mené	2	2	2	0	0	4	2	0	12	
Bougouré	1	3	2	1	2	5	0	0	14	
Bare	3	2	2	1	0	3	3	0	14	
Tissi	3	4	2	0	6	3	2	0	20	
Dankui	3	3	2	3	0	3	0	0	14	74
STD**										
Mené	1	2	1	0	0	3	0	0	7	
Bougouré	0	1	2	0	0	5	0	0	8	
Bare	2	1	1	0	0	2	2	0	8	
Tissi	2	3	1	0	4	2	1	0	13	
Dankui	2	2	3	2	0	2	0	0	11	47
PCT-SUM**										
Mené	3	2	0	0	0	5	0	0	10	
Bougouré	0	1	2	0	0	7	0	0	10	
Bare	2	1	1	0	0	4	1	0	9	
Tissi	3	1	2	0	1	3	1	0	11	
Dankui	2	1	1	0	0	2	0	0	6	46

NOTES: \*Rounded to the nearest whole number

\*\*N = number of households STD = Standard deviation PCTSUM = percentage SUM

\*\*\*Due to rounding of the mean the percentage sum over all villages sums to 101.

## CHAPTER FIVE

### THE MODEL OF SHORT-RUN MARKETED SURPLUS RESPONSE

#### 5.1 THE ASSUMPTIONS

The model of marketed surplus to be presented here is based on a number of assumptions which will now be outlined. The results of the empirical estimations of the model will be presented in the subsequent section.

We will first define the disposition of output with the following identity:

$$(1) \text{ HARV} = \text{GSKGY} + \text{AMTGIV} + \text{CONSUM} + \text{STORAGE}$$

The output or harvest (HARV) can be disposed of in four (4) ways. The household can sell its cereal grains (GSKGY), give them away in the form of gifts or payments-in-kind for services rendered (AMTGIV); they can also be consumed (CONSUM) or they can be stored (STORAGE).

Since the model to be presented is a model of short-run marketed surplus response in Burkina Faso, our first assumption will be that output (HARV) is exogenous or fixed for the one year period of the study.

We do not assume as Haessel does, that consumption and sales are strict complements. We are in agreement with Dennis L. Chinn in his statement that by considering consumption and sales as strict complements one "... ignores the farmers' additional option of simply adding to (or subtracting from) existing stocks." (Chinn, 1976, pg. 583)

Our second assumption is that in-kind expenditures are contractually determined and therefore, non-responsive to changes in price and output. The phenomenon of cereal grain in-kind expenditures accounting for a significant and in some cases larger percentage of harvest than do grain sales suggests that this variable may be potentially important in explaining the sales behavior of farmers. Cereal grain exchange is a possible means of redistribution of food grains among households which precludes market participation. It is performed for a variety of reasons including the fulfillment of social obligations and as payment for services rendered.

These exchanges are a function of such stochastic variables as deaths, births, marriages, rainfall (which determines in part the need for work parties), and non-stochastic variables such as recognized and celebrated annual religious holidays and ceremonies for rites of passage. It is therefore believed that cereal grains given away/exchanged should be considered as a factor in the model determining the marketed surplus response of farm households.

Storage (STORAGE) is also considered to be an independent variable in the model. It can be taken as a positive or negative residual or calculated as ending storage.

## 5.2 THE DEFINITION OF MARKETED SURPLUS

The amount of cereal sold (GSKGY) is taken as the measure of marketed surplus:

$$(2) \text{ MS} = \text{GSKGY}$$

and marketed surplus is assumed to be a function of the following variables:

$$(3) \text{ MS} = \text{GSKGY}(\text{HARV}, \text{PRICES}, \text{AMTGIV}, \text{STORAGE})$$

Three more variables will be used in the empirical estimation of the model. SUMCEQD is used as an indicator of family size; SUMCEQD is the number of consumer equivalency units per household. CATSREQ and TOTCASHE will also be included. CATSREQ is a weighted measure of cattle and small ruminants held by each household at the beginning of the study. TOTCASHE is the total number of hectares planted in cash crops for each household. These last two variables were used as indicators of alternative cash generating opportunities.

At this time we will present a brief discussion of the consumption side of our model. We are also interested in examining the response of consumption to the average yearly cereal grain prices (PRICE), the output of cereal grains (HARV) and the number of consumer units (SUMCEQD) present in the household. We assume that consumption is a function of these three variables. It will be important to compare the marketed surplus response and the consumption response of the farm household with respect to these variables.

To simplify the terminology we will state the basic short-run marketed surplus model as follows:

$$(4) \quad G = g(H, P, A, E, S)$$

where

- G = GSKGY or gross yearly sales in kilograms
- H = HARV or volume of cereal grains harvested
- P = PRICE or the average price of cereal grains
- A = AMTGIV or the value of the volume of cereal grains given away or exchanged
- E = STORAGE or the ending volume of cereal grains stored
- S = SUMCEQD or the number of consumer equivalency units.

The consumption model can be stated as follows:

$$(5) \quad C = f(H, P, S)$$

where

- C = CONSUM or yearly cereal grain consumption
- H = HARV or volume of cereal grains harvested
- P = PRICE or the average price of cereal grains
- S = SUMCEQD or the number of consumer equivalency units

The estimation of this model will provide us with the short-run price elasticity of supply for marketed surplus or

$$(6) \quad p = \frac{G}{P} \frac{P}{G}$$

and the short-run output elasticity of marketed surplus or

$$(7) \quad h = \frac{G}{H} \frac{H}{G}$$

### 5.3 THE HYPOTHESES

We will now assert the hypotheses which we have formulated with regards to the price and output responses of short-run marketed surplus and consumption. These hypotheses have been formulated for cereal grain selling households. Let us first state those which apply to the short-run marketed surplus response:

- (1) The volume of cereal grains sold (GSKGY) by the household will increase with an increase in the price of cereal grains (PRICE).
- (2) An increase in cereal grain output (HARV) will lead to an increase in the volume of cereal grains sold (GSKGY).
- (3) A negative relationship exists between the value of the volume of cereal grains given away (AMTGIV) and the volume of cereal grains sold (GSKGY).
- (4) It is hypothesized that as the number of consumer units increases (SUMCEQD) the volume of cereal grains sold will decrease (GSKGY).
- (5) Both of the alternative sources of cash-generation (CASTREQ, TOTCASHE) are hypothesized to be negatively related to cereal grain sales (GSKGY). As the availability of alternative means of cash generation increases the sales of cereal grains will decrease.

The hypotheses which have been formulated for our consumption equation are:

- (1) The price of cereal gains is negatively related to the consumption of cereal grains.
- (2) Output and consumption are positively related. An increase in output will lead to an increase in the amount of cereal grains consumed.
- (3) As the consumption requirements of the family increase, hence, as the number of consumer equivalency units increases, consumption will also increase.

#### 5.4 ESTIMATION

The objective of this study was to determine the factors which influence the marketed surplus supply of cereal grains in Burkina Faso. The model which was presented in the preceding section was used to estimate the equations for marketed surplus. The variables used in the analysis were GSKGY, HARV, SUMCEQD, AVYPR, AMTGIV, TOTCASHE, and CATSREQ. STORAGE was assumed to be the residual.

The dependent variable or GSKGY is the total volume (in kg) of cereal grains sold by the household during the period of December 1983 through November 1984. The cereal grains included in the composite measure, as well as in the remaining variables constructed from cereal grains,

include red sorghum, white sorghum, millet, fonio, maize, rice and food aid. By combining these cereals into one measure we are assuming that they exist as substitutes for rather than complements of one another.

The dependent variable (GSKGY) is to be explained by five independent variables; the first of which is the output of cereal grains (HARV). This variable consists of the total volume of cereal grains harvested during the 1983-84 agricultural season. Six of the cereals previously mentioned (excluding food aid) are included in this variable.

The size of the household is also hypothesized to be a factor influencing the amount of cereal grains sold. It is for this reason that the second variable, SUMCEQD, is included in the analysis. This variable is a weighted measure of the number of consumer equivalency units present in each of the households. (See Appendix I.) We feel that this variable since it is a weighted measure, more accurately reflects the composition of households than per capita measures which count each individual, regardless of their age and/or sex, equally.

The third independent variable in the analysis is AVYPR or the average selling price of cereal grains per household. For the purposes of this analysis price will now be considered exogenous and independent of the quantity of output produced.

AMTGIV is the fourth variable in our model. As explained earlier this is a variable measuring the value of the amount of cereal grains given away during the December 1983 to November 1984 period.

STORAGE is taken as the residual. It will not be dealt with explicitly in this paper.

We are also interested in exploring the relationship that exists between the amount of cereal grains consumed and the average yearly price of cereal grains (PRICE), cereal grain output (HARV), and the family size (SUMCEQD). For this reason, we will also estimate an equation for the consumption activities of the farm household. It should be remembered that the data set for consumption is incomplete due to the shortened time period for which data was collected in Baré. Therefore, the consumption equation is estimated for only four of the sample villages: Mené, Tissi, Dankui, and Bougouré.

The results of the ordinary least squares regressions of marketed surplus are presented in Table 5.1. All of the models were estimated for the subgroup of cereal grain sellers. Estimations for the entire sample will be made in future analyses as there was an insufficient amount of time to correct for truncation which occurs if the models are estimated for the entire sample.

The marketed surplus response of cereal grain sellers in all five villages was estimated in Models 1A to 4A. Due to the considerable amount of variation in the dependent variable among the cereal grain selling households we have estimated the equations in double log form. By using this form, we obtain variables that are more normally distributed.

$$(1) \text{ GSKGY} = \beta_0 + \beta_1 \text{HARV} + \beta_2 \text{SUMCEQD}$$

:(A) estimated for sellers in all villages

$$(2) \text{ GSKGY} = \beta_0 + \beta_1 \text{HARV} + \beta_2 \text{SUMCEQD} + \beta_3 \text{PRICE}$$

:(A) estimated for sellers in all villages

$$(3) \text{ GSKGY} = \beta_0 + \beta_1 \text{HARV} + \beta_2 \text{SUMCEQD} + \beta_3 \text{PRICE} +$$

$$\beta_4 \text{AMTGIV}$$

:(A) estimated for sellers in all villages

$$(4) \text{ GSKGY} = \beta_0 + \beta_1 \text{HARV} + \beta_2 \text{SUMCEQD} + \beta_3 \text{PRICE} +$$

$$\beta_4 \text{AMTGIV} + \beta_5 \text{CATSREQ} + \beta_6 \text{TOTCASHE}$$

:(A) estimated for sellers in all villages

The consumption model (Table 5.2.) is also estimated in log form. However, it should be remembered that this equation was estimated for the sample of cereal grain sellers in four rather than five of the villages. We have excluded Baré due to data limitations.

$$(5) \text{ CONSUM} = \beta_0 + \beta_1 \text{HARV} + \beta_2 \text{SUMCEQD} + \beta_3 \text{PRICE}$$

:(A) estimated for sellers in all villages

The estimated log-linear equations can be found in Tables 5.1. and 5.2. The coefficients represent constant elasticities since the estimated equations are log-linear. We will be referring to these equations throughout the subsequent analysis. As we are interested in

TABLE 5.1  
MARKETED SURPLUS FUNCTION: ESTIMATES OF LOG-LINEAR EQUATION COEFFICIENTS

Dependent Variable	Independent Variables							R <sup>2</sup> **	Adj R <sup>2</sup>
	INTERCEPT*	HARV*	SUMCEQD*	PRICE*	AMTGIV*	CATSREQ*	TOTCASHE*		
GSKGY (N=86)									
Model 1A	-.6643 (-.746)	.8237 (7.303)	-.0521 (-0.312)					.4032 (28.378)	.3890
2A	.7300 (.566)	.7889 (6.895)	-.0429 (-.259)	-.2843 (-1.486)				.4187 (19.926)	.3977
3A	1.3757 (1.028)	.7061 (5.669)	-.0502 (-.306)	-.2524 (-1.324)	-.0531 (-1.605)			.4364 (15.872)	.4089
4A	1.3275 (0.927)	.7063 (5.425)	-.0579 (-.329)	-.2551 (-1.26)	-.0494 (-1.337)	-.0125 (-.094)	.0100 (.223)	.4368 (10.340)	.3945

NOTES: \*t-statistics are enclosed in parentheses.

\*\*F values are enclosed in parentheses.

N = number of observations.

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TABLE 5.2

## CONSUMPTION FUNCTION: ESTIMATES OF LOG-LINEAR EQUATION COEFFICIENTS

Dependent Variables	Independent Variables				R <sup>2</sup> **	Adj R <sup>2</sup>
	INTERCEPT*	HARV*	SUMCEQD*	PRICE*		
CONSUM*** (N=39)						
Model 5A	4.8081 (15.197)	.2496 (3.911)	.1802 (1.901)	+.0538 (.382)	.2497 (3.993)	.1872

NOTES: \*t-statistics are enclosed in parentheses.  
 \*\*F values are enclosed in parentheses.  
 \*\*\*Estimated for four villages--does not include Baré.  
 N = number of observations.

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identifying those variables which have a bearing upon the farmers' decision to sell cereal grains, discussion of these variables will be presented first.

### 5.5 ESTIMATION RESULTS: MARKETED SURPLUS

Marketed surplus in our models is defined as the quantity of cereal grains sold. In our first model, we assume that the quantity of cereal grains sold is a function of the output produced in the previous years' harvest (1983-84) and the number of consumer equivalency units in a household.

We have found that these variables explain a significant proportion of the variation in the gross sales of cereal grains in Burkina Faso. When the equation is estimated for sellers of cereal grains our model is significant at the .01 level and explains approximately 40 percent of the variation in gross cereal grain sales. Output or harvest is significant at the .01 significance level and the output elasticity of marketed surplus is .82. In this model, we also find that the number of consumer equivalency units in a household does not have a significant effect at the .01 level on the volume of cereal grains sold.

If we expand upon our model to include both output and price as well as consumer equivalency units we can then look at the second model. For the subgroup of cereal grain sellers this regression is also significant at the .01 significance level.

Price, however, is not a significant at the .01 level while output is highly significant at this level. The fact that price is insignificant suggests that those who sell do so primarily in response to the level of output which they produced during the last year's harvest. Approximately 40 percent of the variation in the gross sales of sellers of cereal grains is explained by these variables.

The previous two models did not explicitly address the question of grain disposal through inter-household, intra-household and inter-village transactions. If, however, we would like to examine the possibility that the amount of cereal grains transferred is important to the selling decision of the farm household then we must explicitly introduce this variable into our model. At a later point in time we will be looking at

the possibility that grain transfers be considered as an endogenous rather than an exogenous variable. For future analysis, it will be hypothesized that the amount of cereal grains transferred is a function of the output of cereal grains, the average price of cereal grains and certain other socioeconomic and demographic variables. We propose the use of a simultaneous equation system to estimate the marketed surplus response of farm households when considering the amount of grains transferred as endogenous.

It is believed that this last variable is important to the analysis of the selling behavior of farmers because of the sheer volume of cereal grains exchanged in this manner. If one is concerned with the competing demands for the use of cereal grains in a country where the production of cereal grains is inadequate for the resident population, it will be very important to examine the exchange patterns in cereal grains. Through inclusion of this variable in the analysis we can further identify those factors which exist in relationship to the amount of cereal grains sold.

At this time, however, some preliminary results will be presented based on the assumption that the amount of cereal grains transferred is exogenous. The sales equation has been estimated with the following independent variables: harvest, average yearly price, total number of household consumer equivalency units and the value of the amount of cereal grains transferred by the household. This is model three (3).

The relationship existing between the cereal grain sales of selling households and the value of the amount of cereal grains given away is significant at the .11 level and negatively related to sales. The selling households do respond positively to increases in output; as the coefficient on HARV is significant at the .01 significance level. We also find that PRICE is significant but only at the .19 level. It has a negative relationship with gross sales. These results further support the hypothesis that the sellers sell because they have an output level which allows them to dispose of what may be labeled as "surplus" cereal grains.

The negative relationship estimated in models two and three is contradictory to the hypothesized behavior of cereal grain sellers. We will examine this result more thoroughly at a later time; however, for

the moment we would like to offer a few explanations for why this may be occurring.

One of the ways a negative price response could be explained is as follows; farmers are in need of cash during the post-harvest time therefore they choose to sell their cereal grains at this time. This post-harvest period coincides with the period of low cereal grain prices and farmers are selling cereal when the price of these grains is lowest. The farmers may not be selling grains during the high price period because they lack a "surplus" or even a subsistence store of cereal grains.

The cereal grain selling households might be divided into two subsets. The first subset consists of small volume cereal grain sellers. These sellers might be responding in the above described manner. A negative relationship between the volume of cereal grains sold and the price of cereal grains is hypothesized for this subset of small volume sellers. The second subset of large volume cereal grain sellers is selling a larger percentage of cereal grains in response to an increase in the price of grain. Disaggregation of the sample will be performed and the appropriate equations estimated to test these hypotheses at a later time.

Some economists have suggested another explanation for the negative price responsiveness of agricultural households. In the case of subsistence agriculture the farm household participates as a consumer and as a producer in the market place. The effect of a price change is then felt in the realm of production and consumption activities of the household. A change in the price of cereal grains can then be decomposed into a substitution effect and an income effect. The substitution effect is generally assumed to be negative; an increase (decrease) in the price of a good (cereal grains) would imply a decrease (increase) in the consumption of that good. However, through the income effect an increase (decrease) in the price of a good will, if the good is a normal good, lead to an increase (decrease) in the consumption of the good. In the case of a price increase, if the income effect outweighs the substitution effect, the household markets a smaller portion of its food grains. The price increase of the good results in a decrease in the quantity sold.

We will not be able to evaluate this hypothesis at the present time, however, this will be investigated through the formulation of a household production model which will allow for one to account for the income as well as the substitution effects of a change in price.

Model (3) will also later be re-estimated as a part of a simultaneous system of equations. This may provide us with still further insights into the response of farmers to the previously mentioned variables.

It was felt that the decision to sell cereal grains may be influenced by two additional factors. Since the farmers are not faced simply with the choice of whether or not to sell their cereal grains one must consider the alternate sources for generating cash. These include the sale of "cash" crops and the sale of cattle and/or small ruminants. It was decided that these variables (cash crop sales, cattle and/or small ruminant sales) should be incorporated into the analysis. The fourth model expands upon our third model and includes a weighted measure of the stocks of cattle and small ruminants as of the first census. This represents the available stock for dispersal throughout the upcoming agricultural year. In addition, the total "cash" crop hectarage under cultivation for each household was taken as a measure of the availability of an alternative source of cash-generation.

In model four (4), neither of these factors were significant at the .01 level. There are a few reasons why this may have occurred. It is possible that these variables may have a high variability in their seasonal importance which is not being picked up in the one year aggregate model. If one were to re-estimate the equations for particular time periods the sale of cattle, small ruminants, and cash crops it is hypothesized that in certain periods the effect of these alternative sources of cash generation would be significant.

It is also possible that more accurate measures of the influence of alternative sources of cash generation can be developed. Instead of using the beginning stocks of cattle and small ruminants as a measure of an alternative source of cash generation one might use a measure of the liquidation of stocks. The problem with this second measure is the fact that decreases in stock number may also be due to non-commercial reasons such as the death of the animals or "poor" recall on the part of

farmers. Another alternative formulation of the cash-generating possibilities from the use of cash crops consists of using the value of cash crops sold rather than the previously mentioned cash crop hectareage measure.

In summary, if we assume the marketed surplus of the farm household is equal to the quantity of grain sold on the market, and that the amount or value of the amount of cereal grains transferred through non-market channels is exogenous to the system as is production, consumption, and changes in stocks we may draw upon our models in developing some conclusions.

First of all, one can say that the variable which consistently influences the amount of cereal grains sold in the sample and in the subgroup of sellers, is harvest or total output. This variable is highly significant in all versions of the models. The output elasticity of marketed surplus is positive and in all cases less than one.

The price elasticity of marketed surplus is calculated only in the case where PRICE was significant at the .01 level. Using this criteria, we were unable to calculate a price elasticity since the results showed that cereal grain selling farm households were not responsive to price and hence we did not calculate price elasticities for this group.

If one considers the large volume of cereal grains transferred through non-market channels one must question the issue of exogeneity of AMTGIV. If one assumes this variable to be exogenous then the present analysis serves as an accurate guide to identifying those factors which influence the sale of food grains. If, however, on the other hand, these amounts do respond to such economic variables as price and output and, in addition, influence grain sales (both directly and indirectly through price and output) then a simultaneous system should be estimated.

Preliminary work, expressed in models three and four suggests that for cereal grain sellers the relationship existing between the value of cereal grains transferred and the volume of cereal grains sold is not significant at the .01 significance level.

The inclusion of the two measures of alternative cash-generating opportunities did not allow us to make positive inferences concerning the effects of these variables on cereal grain sales. Improved measures of

these cash-generating opportunities will be used in future analyses of the question of short-run marketed surplus response in Burkina Faso.

#### 5.6 ESTIMATION RESULTS: CONSUMPTION

The variables used in the estimation of the consumption equation are CONSUM, HARV, SUMCEQD, and PRICE. CONSUM is the yearly consumption of cereal grains in each household and the remaining variables are as previously defined.

The estimated equation was found to be significant at the .01 level with an R-squared of .2497. HARV and SUMCEQD were both found to be positively related to yearly consumption. HARV was significant at the .01 level. SUMCEQD and PRICE were not found to be significant at this level. A significance level of .1 was found to be appropriate for the number of consumer equivalency units or SUMCEQD.

The effect of a one percent change in the number of consumer equivalency units is estimated to bring forth a .18 percent change in consumption. The consumption of the household also responds positively to output changes. The parameter estimate on the output variable is .2496. The lack of price response on the part of the farm household is hypothesized to be a result of the constant demand for cereal grains that the household requires especially in the deficit zone.

The output response of consumption suggests that a portion of the increase in output is allocated for the consumption of food grains. This is a relatively small proportion of the increase in output in comparison to the output responses of cereal grain sales.

#### 5.7 ESTIMATION RESULTS: MARGINAL PROPENSITY TO MARKET

The estimation results of the marginal propensity to market model are highly significant at the .01 significance level and explain 37 percent of the variation in the marginal propensity to market (see Table 5.3). It is important to note in this case that the model shows us that output is positively related to marginal propensity to market. When output increases so does the marginal propensity to market. However, this

TABLE 5.3

MARGINAL PROPENSITY TO MARKET FUNCTION: ESTIMATES OF SINGLE-LOG EQUATION COEFFICIENTS

Dependent Variables	Independent Variables				
MPM (N=86)					
MPM	INTERCEPT*	HARV*	HARV2*	R <sup>2</sup> **	Adj R <sup>2</sup>
Model 6A	3.6629 (16.386)*	.0008 (5.168)	-3.4 -08 (2.614)	.3746 (25.158)	.3597
NOTES: *t-statistics are enclosed in parentheses. **F values are enclosed in parentheses. ***Estimated for four villages--does not include Baré. N = number of observations.					
University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.					

increase does not occur at a constant or increasing rate but rather at a decreasing rate; as output increases the rate at which the marginal propensity to market increases is less than that of the increase in output.

This suggests that as output increases the proportion of the output increase that is allocated to consumption increases since as the model illustrates the marginal propensity to market is negative. These results are clearly consistent with the findings of the consumption model.

## CHAPTER SIX

### CONCLUSIONS

The research for this report has focused on the identification of farmer responsiveness to changes in a number of policy variables. More specifically, we have examined the marketed surplus response of the group of farm households that sold grain during the one-year period extending from December 1983 to November 1984. To complement the analysis of marketed surplus response we have also presented the results of the consumption analysis performed for four of the five sample villages.

The major finding of this report is that the subgroup of grain sellers is most responsive to changes in output. A one percent change in output results in a .82% change in the amount of cereal grains sold in our basic model (1). It must be noted, however, that this response is less than a proportionate response to a change in output; not all of the output increase is marketed.

Our findings do not support the hypothesis that grain sellers are price responsive in the short run. Price was not found to be a significant variable in any of the models of the marketed surplus equation.

As we expanded our analysis to include alternative means of obtaining cash, the seasonality aspect of the analysis became important. Clearly, to fully evaluate the relevance of the farmer's choice between which goods to sell, one must disaggregate the one-year period into the appropriate "marketing seasons." The trade-offs or the relative opportunity cost of selling a good changes throughout the one-year period. We feel that in order to understand the marketed surplus response of farmers, one must examine the alternatives which were available to the farmer at the time the choice to sell his cereal grains was made.

Let us now examine the role of cereal grains transfers. Assuming that grain transfers (the volume of grain given away) are exogenous, led us to the conclusion that this alternative use of cereal grains, although not significant at the .01 level, was significant at a higher level than that of prices (at .11 level for transfers as compared to a .19 level for

prices) the negative sign on this variable points to the competing uses of cereal grains.

The use of cereal grains in transfers competes with the household's choice to sell its grains in the market. It must be remembered that the significance of this relationship (at the .01 level) is not maintained by the analysis; and therefore, we cannot at this time make a statement as to the importance of the use of grain in transfers for the farmer's decision to market cereal grains.

The policy recommendations which can be made at this time are limited by the scope of this analysis. Given the assumptions previously outlined, our results suggest that the most direct way to affect a farmer's marketing choice is through output. The largest response elasticity was associated with output. In the short run this suggests that the volume of grains harvested is important to the choice to sell. Therefore, if farmers have a "sufficient" volume of grains, they are then willing to sell cereal. The farmer's motivation to sell is not in question, rather it seems that the ability to sell is of more significance.

This is consistent with the anthropological findings of Constance McCorkle who suggests a hierarchy of marketing behavior (see Volume III, Research Report No. 1). The marketing of grain doesn't take place unless there is clearly a "surplus." For the farmers who do participate in the market then, when an output increase occurs, they market over 80% of this increase as they are already above the pre-determined "surplus" level and the response is relatively large as compared to that of price.

Policies affecting price are seen from this analysis to be less effective in comparison to those which would support an increase in output available to the farmer in the short run. It is to be emphasized at this time that these results do not look at long-run responsiveness, hence, the price responsiveness of supply cannot be discussed in this context. It may be that in the long run, output or supply does respond to price. We, however, have not examined this issue. We have found that in the short run (one year) the marketed surplus response to a change in price is not significant or grain sales in the short run do not respond significantly to changes in price. It is difficult, therefore, to make

recommendations with regards to price policy using this framework of analysis. We can, however, stress that in the short run a farmer's decision to market his grain is directly the result of the volume of output which is available to the household, while the price which prevails is empirically insignificant.

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APPENDIX

## APPENDIX 1

## Consumer Equivalent Weights

Sex/Age	0-4	5-9	10-15	16
Male	.2	.5	.75	1
Female	.2	.5	.7	.75

SOURCE: Sherman, J. 1984, pg. 106.

Consumer Equivalency Unit (per person) =  
 number of months present/12 x appropriate  
 weight from the table above (depending on  
 sex and age of person).

University of Michigan. The Dynamics of Grain Marketing in Burkina Faso, 1986.

THE DYNAMICS OF GRAIN MARKETING  
IN BURKINA FASO

VOLUME III

RESEARCH REPORT 4

CEREAL SALES BEHAVIOR AMONG FARM HOUSEHOLDS  
IN FOUR VILLAGES OF BURKINA FASO

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prepared for  
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(USAID: AFR-C-1472)  
and  
Burkina Faso Grain Marketing Development Research Project

Prepared by  
Center for Research on Economic Development, University of Michigan  
and  
International Agricultural Programs, University of Wisconsin  
for  
United States Agency for International Development (USAID)  
Contract No. AFR-0243-C-00-2063-00

May, 1987

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## CHAPTER 1

### INTRODUCTION

Research on cereal marketing behavior among farming households in West Africa is receiving increasing attention. Following the severe drought conditions of the early 1970s, the interplay of marketing policy and food security has been seen as an important issue.

A central question in cereal marketing research is the selling behavior of farm households. To formulate effective policy, it is necessary to develop an understanding of the determinants of cereal sales. Once these determinants are understood, policy can be designed which would encourage the augmentation of marketed surplus from farm production, and thereby increase food security.

Two economic variables which policy can attempt to influence are price and output. In order to affect the former, programs can be designed which influence the price producers receive for their output. The government of Burkina Faso already seeks to influence producer prices through the actions of the government marketing board. Attempts to influence producer prices, while at the same time trying to control the growth in consumer prices, often result in a cost to government. The necessity and effectiveness of these market interventions are important policy questions.

Policies which affect output can involve a combination of research and extension interventions. Investments in the development of agricultural technology are long term in nature and designed to provide a means to increase crop production. Extension programs generally seek to increase the adoption of existing, proven, output-increasing technologies in the short run.

To the extent that policies designed to affect price and output compete for the same government resources, both in fiscal terms and in terms of trained manpower, the two interventions are in competition. An understanding of the influence of both price and output on producer sales behavior could help to lead to a more efficient allocation of these limited resources.

The objective of this analysis<sup>1</sup> is to identify those factors which influence household cereal sales. This is the first step in developing policies which would help to increase the amount of cereal grains marketed by farmers in Burkina Faso.

The report is divided into four sections. The first provides an overview of the four villages in which research was conducted. The second section describes the methodology of data collection and the variables used in the analysis. A presentation of the results and discussion of the analysis follows, and is divided into two parts: an analysis of annual cereal sales behavior and an analysis of intra-annual sales behavior. The fourth and final section focuses on conclusions and policy implications.

### 1.1 THE SETTING

The analysis presented here concerns four of the FSU/SAFGRAD study villages: Nédogo, Poédogo, Dissankuy, and Diapangou. These villages have been described extensively elsewhere as has the data set employed in this analysis (FSU/SAFGRAD 1982; Lang, et al. 1983; Ohm, Nagy, Pardy 1984). Descriptive information on each village will be presented briefly here.

Nédogo is located in the Central Plateau, approximately 30 km northwest of Ouagadougou. Because of high population pressure, fallow periods have become shortened, and soil fertility has deteriorated. Annual rainfall in Nédogo is between 700 to 800 mm. The cropping pattern is dominated by cereals, mainly millet (57% of the cropped area) and white sorghum (21%). The principle cash crop in Nédogo is peanuts (Lang, et al. 1983).

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<sup>1</sup>The field research described in this report was undertaken by the Purdue University Farming Systems Research Unit of the Semi-Arid Food Grain Research and Development Program (FSU/SAFGRAD) and funded by the U.S. Agency for International Development (AFR-C-1472). The analysis was conducted at the University of Wisconsin office of International Agricultural Programs and funded under a subcontract of USAID contract (AFR-0243-C-00-2063-00) with the Center for Research on Economic Development of the University of Michigan.

Poédogo is located in the southern part of the Central Plateau, near Manga, an active cereal grain market. This village generally receives between 800 and 900 mm of rain annually. As in Nédogo, cereal crops represent the largest amount of cropped area (92%), but sorghums, and especially white sorghum, are relatively more important. Peanuts represent the principle non-cereal crop.

Dissankuy is located in the relatively fertile Volta Noire region, approximately 120 km north of Bobo-Dioulasso. Land in this area is less limiting than on the Central Plateau, and grain yields are higher (Lang 1984). Annual rainfall is between 800 to 900 mm, and cotton is produced on about 15 percent of the land (Lang, et al. 1983). Other non-cereal crops include peanuts and bambara nuts, although the former is more important than the latter (Lang 1984).

Diapangou receives annual rainfall in the 700 to 800 mm range and is located in a land abundant zone, east of Ouagadougou and approximately 25 km from Fada. Shifting cultivation is practiced in this village (FSU/SAFGRAD 1982). In Diapangou, millet and white sorghum are grown in an association which includes approximately 75 to 90 percent millet (Lang 1984). Peanuts are the most important non-cereal crop (Lang, et al. 1983).

## CHAPTER 2

### METHODOLOGY

#### 2.1 THE STUDY

In each of Nédogo, Poédogo, and Dissankuy, data were collected from 30 randomly selected households. In Diapangou, 30 households were randomly selected from those having animal traction. For the purposes of this study, a household is defined as a production/consumption unit. Each household head was interviewed on a monthly basis and asked to provide data on current cereal and animal stocks, as well as inflow and outflow transactions information for cereals and animals.

Data were collected from May 1983 to January 1985. The analysis presented here utilizes a subset of these data, and represents sales behavior from October 1983 to September 1984. From May to October both the households and enumerators had time to become accustomed to the survey, resulting in an increase in the quality of the data collected.

Interviews were conducted with the household head, and were based on recall. During the interviews, the household head was asked to provide information on the stocks and transactions of other household members. The latter were often interviewed if the household head could not provide adequate information, and as a check on information provided by the household head. Women were consulted about their stocks and transactions, and about household consumption. The degree to which women were interviewed depended on village mores relative to interviewing of female household members by male enumerators. The owners of personal stocks were interviewed about these stocks.

The data were recorded by the enumerators directly on the questionnaires during the interviews. Quantities were reported in local units by the farmers and converted to kilograms based on average conversion factors determined by measurement at the beginning of the study. For purposes of estimating consumption, each household was asked to utilize a single measure when removing grain from storage. This led to increased standardization in the consumption data. Farmers expressed interest in the study and cooperated enthusiastically because they felt it helped them to budget their cereal stocks.

In April 1984, several households judged to be non-cooperators were eliminated from the sample. For this analysis only those households who participated in the survey during the entire year (October 1983–September 1984) were included. At the analysis phase, households were removed if their sales were thought to reflect a trading enterprise rather than a farming enterprise.

## 2.2. THE VARIABLES

The data set was analyzed using both descriptive and regression techniques. The goal of the report was to determine those factors which explain the variation in cereal sales among households in the four villages studied. Sales can be thought of in two ways, as gross volume marketed by farm households, or as sales minus purchases, or net sales. Net sales measures the net contribution of cereals by a household to the market. Crops can be grown and subsequently sold to obtain cash which is used to purchase crops of a higher desirability for consumption. The net sales figure would take into account this behavior.

Independent variables related to net sales would, in fact, be explaining the difference between sales and purchases. Put another way, net sales figures take into account factors influencing both purchases and sales, and not pure sales behavior. Since this report attempts to identify only the factors affecting cereal sales, gross sales were chosen over net sales as the relevant dependent variable.

Gross cereal sales were defined as the total volume of millet, corn, rice, red sorghum and white sorghum marketed during the one-year period from October 1983 to September 1984. This time period corresponds to a marketing year as indicated by the variation in cereal stocks. Harvest of the major cereal crops takes place from September to December. As a result, stocks are highest in December and then decline until the following harvest. The analysis therefore models the disposition of the 1983 grain harvest during the following marketing year.

During the analysis, several independent variables were developed. Animal units were defined as the household endowment of sheep, goats and cattle, with cattle used as the base of the combined animal unit. Small

ruminants were weighted using a factor of .06 derived from the relative value of each animal species based on sales observations. The 1983 cereal harvest was calculated using information on pre-harvest stocks, inflows, outflows and after harvest stocks. Producer and consumer equivalents were calculated utilizing census information from April 1984 and conversion factors as noted in Appendix 1. Seasonal outmigration is important in Burkina Faso and household population can vary substantially over the year. April 1984 represents the start of the agricultural season, a time when those involved principally in agricultural activities would most likely be present. In any case, no data were available on changing household composition or population. The price variable represents the mean yearly price for all cereals based on observed transaction prices. The independent variable for cash hectareage included the total area devoted to peanuts and cotton during the 1983 cropping season.

Analysis was performed both on a village level, and by wealth groups. Wealth categories were created by dividing sample households into four groups based on the total value of their animal stocks at the end of the harvest (December 1983) and the value of their agricultural capital equipment in 1984.

## CHAPTER 3

### RESULTS AND DISCUSSION

#### 3.1 ANNUAL CEREAL SALES

During the twelve-month period from October 1983 to September 1984, 79 percent of the sample households sold cereal grains. This represents an average household volume of 388 kg in yearly cereal sales. In terms of total volume, gross sales varied substantially across the four villages studied (Table 1). Diapangou accounted for the greatest volume of cereals sold during the year with 31 percent of the total over all four villages, followed by Poédogo (28%), Nédogo (26%), and Dissankuy (15%).

This ranking is modified when yearly cereal sales are expressed on a per household basis. In terms of sales per selling household, Poédogo is highest followed by Diapangou, Dissankuy, and Nédogo. When cereal sales are divided by total households, the ranking is Poédogo, Diapangou, Nédogo, and Dissankuy. Poédogo and Diapangou are also highest in terms of cereal sales per producer equivalents among all households and selling households. Dissankuy selling households marketed less than households in Poédogo and Diapangou, both on a per household or per producer unit basis. Dissankuy, located in the fertile Volta Noire region, ranked at the lower end of sales indicators among the more productive villages in the sample. These results may indicate that marketing policies have a relatively larger potential effect in fertile regions of Burkina Faso.

The findings for Dissankuy are interesting in terms of the effect of cotton growing on cereal sales. In this village, cotton production is an important cash crop activity: 78 percent of the sample farmers had cotton acreage in 1983. The data suggest that for the village as a whole, grain sales were lower, both in terms of total volume and on a per household basis than in non-cotton growing villages. In fact, of the total sample's 21 non-selling households, 14 were from Dissankuy (67%).

In order to test the hypothesis that cotton production in Dissankuy had an effect on yearly cereal sales behavior, the mean sales of cotton and non-cotton producing households were compared. Should cotton

TABLE 1 YEARLY GROSS CEREAL SALES BY VILLAGE					
	Gross Sales				
	Village	Sellers			Sample
Sum (kg)		Per Household	Per Producer Equivalent	Per Household	Per Producer Equivalent
Nédogo	8,033	286.89	42.76	277.00	42.13
Poédogo	8,799	483.83	82.70	419.00	71.42
Dissankuy	4,859	373.77	72.31	179.96	39.47
Diapangou	9,765	443.86	79.98	390.60	71.49
Total	31,456	385.35		308.39	

University of Michigan. The Dynamics of Grain Marketing in Burkina Faso, 1986.

production in Dissankuy be related to decreased household sales behavior, some households may in fact have zero cereal sales. Thus, the relevant data set would include all sample households in Dissankuy, including those that did not sell as well as those that did. Although the mean yearly cereal sales of the cotton producing households was larger than that of the non-cotton group, there was insufficient evidence to conclude that the means were significantly different (Table 2). This was primarily a result of the large standard deviation in mean cereal sales for the two groups, as well as the small number of observations.

To investigate further the effect of cash cropping on cereal sales, mean gross sales of cash crop and non-cash crop producing households were compared for all villages except Dissankuy. All the observations in the data set were combined across villages in order to increase the number of observations for the non-cash crop producing group. Cash crops were defined as peanuts and cotton, and since only one household produced cotton outside of Dissankuy (this household also produced peanuts), the mean yearly cereal sales of peanut and non-peanut producers are being compared.

The data indicate that mean yearly cereal sales of cash crop producing households were larger than for non-cash crop producing households, both for selling households and for the sample as a whole (Table 3). The results are significant.

In terms of wealth, agricultural households are an extremely heterogeneous group. As a result, cereal sales vary greatly among households, even within a given village. Households which have alternate sources of capital for liquidation, such as animals, can be expected to behave differently from those that do not. The resource endowment in agricultural equipment may affect a household's productivity, and hence the quantity of cereal available for sale. Households with like endowments of these wealth components could be expected to behave similarly.

As would be expected, the poorest and lower middle group were responsible for a smaller proportion of the total cereal sales than were the wealthier and upper middle group (Table 4). The relationship between wealth and sales volume, however, was not strictly linear. In fact, the

TABLE 2

DISSANKUY: MEAN YEARLY GROSS CEREAL SALES OF COTTON AND NON-COTTON  
CROP PRODUCING HOUSEHOLDS

Group	Sellers				Sample			
	N	Mean	Standard Deviation	T Statistic	N	Mean	Standard Deviation	T Statistic
Cotton	10	426.40	286.50	1.5526 <sup>a</sup>	21	203.05	290.78	1.1158 <sup>a</sup>
Non-cotton	3	198.33	200.27		6	99.17	166.87	

NOTE: <sup>a</sup>No significant difference at .10 level.

University of Michigan. The Dynamics of Grain Marketing in Burkina Faso, 1986.

TABLE 3								
NEDOGO, POEDOGO, AND DIAPANGO: MEAN YEARLY GROSS CEREAL SALES OF CASH AND NON-CASH CROP PRODUCING HOUSEHOLDS								
Group	Sellers				Sample			
	N	Mean	Standard Deviation	T Statistic	N	Mean	Standard Deviation	T Statistic
Cash-crop	62	412.10	434.71	2.7254***	69	370.29	430.38	2.3015***
Non-cash crop	6	174.50	165.27		6	174.50	165.27	
NOTE: ***Significant at .05 level.								
University of Michigan. The Dynamics of Grain Marketing in Burkina Faso, 1986.								

TABLE 4  
YEARLY GROSS CEREAL SALES BY WEALTH GROUP

		Sellers			Sample	
Village Wealth	Sum (kg)	Per Household	Per Producer Equivalent	Per Household	Per Producer Equivalent	
Poorest	2,147	153.36	29.90	89.46	19.87	
Lower Middle	9,851	394.04	73.24	328.37	60.92	
Upper Middle	10,755	413.65	65.36	370.86	60.22	
Wealthiest	8,703	543.94	77.22	458.05	69.51	
Total	31,456	388.35		308.39		

University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.

wealthiest farmers were responsible for a smaller proportion of total yearly sales than were farmers in the upper middle wealth group (28% vs. 34%).

On a per household basis, however, the relationship between wealth and sales is a direct one. Households in the top wealth group sold more on average than did households in any other group, both when selling households or all wealthy households are considered. Among selling households, the wealthiest group had average sales which were more than 3.5 times greater than those of the poorest group. Policies designed to increase net sales may therefore affect wealthier farmers to a greater degree than those in the lower income group.

Interestingly, when the results are examined on a producer equivalent basis, the lower middle group sold a larger amount of cereal than did the upper middle group (Table 4). This was true both for selling households and for all sample households.

The ranking of villages with regard to gross sales is modified within wealth groups. On a volume basis, however, Dissankuy still accounts for the smallest proportion of cereal sales in three of the four wealth groups.

Each village represents a different region of the country and varying cropping patterns. Sales data (Table 5) reflect these differences. In Nédogo, located on the Central Plateau, millet accounted for the largest share of cereal sales during the year, representing 37 percent of the total in that village. Red and white sorghum were also important crops, accounting for 26 percent and 25 percent, respectively, of Nédogo cereal sales. In Dissankuy, white sorghum represented 83 percent of the cereal sold. Millet was the next most important commercial cereal crop sold in this village. In Diapangou, sorghum and millet are grown and harvested together, accounting for the importance of sales of this intercrop combination in that village.

In Nédogo, Dissankuy, and Diapangou, the crop mix of cereal sales reflects closely the 1983 harvest (Table 6). For example, in Nédogo, millet accounted for both the largest amount of sales and the greatest share of harvest, white sorghum represented 26 percent of harvest and a quarter of the cereal sold. Red sorghum accounted for 18 percent of the 1983 harvest and 26 percent of cereal sales. The relatively greater

TABLE 5							
YEARLY GROSS CEREAL SALES DISAGGREGATED BY CROP FOR FOUR VILLAGES IN BURKINA FASO							
Village	Crop						Total
	Red Sorghum	White Sorghum	Millet	Rice	Maize	Millet/Sorghum <sup>a</sup>	
Nédogo	2,059 <sup>b</sup>	2,022	2,984	433	535	--	8,033
	25.63 <sup>c</sup>	25.17	37.15	5.39	6.66	--	100
Poédogo	3,812	1,204	--	3,783	--	--	8,799
	43.32	13.68	--	42.99	--	--	100
Dissankuy	--	4,030	789	--	40	--	4,859
	--	82.94	16.24	--	.82	--	100
Diapangou	--	439	--	97	--	9,229	9,765
	--	4.50	--	.99	--	94.51	100

NOTES: <sup>a</sup>Millet/sorghum association.  
<sup>b</sup>Sum in kg.  
<sup>c</sup>Percent of total.

University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.

TABLE 6  
CEREAL HARVEST FOR FOUR VILLAGES IN BURKINA FASO, 1983

Village	Crop						Total
	Red Sorghum	White Sorghum	Millet	Rice	Maize	Millet/Sorghum <sup>a</sup>	
Nédogo	7,005 <sup>b</sup>	10,281	19,632	502	1,453	--	38,873
	18.02 <sup>c</sup>	26.45	50.50	1.29	3.74	--	100
Poédogo	22,762	3,233	5,255	3,641	464	--	35,355
	64.38	9.14	14.86	10.30	1.31	--	100
Dissankuy	--	25,052	7,577	--	180	--	32,809
	--	76.36	23.09	--	.55	--	100
Diapangou	--	1,592	--	582	1,530	42,096	45,800
	--	3.48	--	1.27	3.34	91.91	100

NOTES: <sup>a</sup>Millet/sorghum association.  
<sup>b</sup>Sum in Kg.  
<sup>c</sup>Percent of total.

University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.

proportion of red sorghum in sales versus harvest can be explained by the fact that red sorghum is not an important food crop. Rice, a minor crop in terms of sales, was cultivated as a cash crop; 86 percent of the 1983 rice harvest was sold. In Dissankuy, white sorghum accounted for 83 percent of the cereal sales and 76 percent of the harvest. Millet was the next most important crop in terms of both sales and harvest. Interestingly, a larger proportion of millet harvest was sold than was the case for white sorghum, again reflecting food preferences. In Diapangou the millet/sorghum association represented the largest share of both harvest and sales.

Poédogo followed the same pattern as the other three villages in terms of red sorghum sales: large harvest was associated with large sales volume. The pattern for rice, on the other hand, was different; in Poédogo rice accounted for a large share of cereal sales (43%), but represented only 10 percent of the 1983 harvest. In fact more rice was sold than was available for allocation from the 1983 harvest. As would be expected, rice did not represent a significant amount of cultivated area in Poédogo. Only three percent of the land cultivated by sample farmers was devoted to rice in 1983. Carry-over stocks of rice were insignificant; gross purchases for rice were high, accounting for 22 percent of total cereal purchases from October 1983 to September 1984 for selling households.

These findings indicate that rice may play a different role in the Poédogo economy than other cereal crops. The large ratio of rice sales to rice harvest supports the conclusion that rice sales activity depends as much on purchases as on own production.

### 3.2 REGRESSION ANALYSIS

The objective of this analysis was to explain the variation in yearly cereal sales among households. Several factors could be expected to influence the amount of grain that a household is able to sell. In farming households operating close to the margin, the amount of grain harvest would likely influence sales heavily. The amount of harvest in turn is directly related to the productive capacity of the farming unit.

One measure of productive capacity is the number of producer units in the household. Because producer units and harvest are directly related, inclusion of both variables would have resulted in multicollinearity. This analysis attempts to study yearly sales in terms of grain allocation over time. For this reason, harvest was chosen over producer units for inclusion as an independent variable.

In multiple enterprise farming households, cereal sales are one option for cash generation. Sales of livestock are another. The stock of small ruminants and cattle should be influential in predicting the amount of grain sold, although it is difficult to hypothesize on the direction of the association. Households with smaller stocks of animals may sell more cereal to provide for their cash needs. On the other hand, those households which are active in cereal commerce may rely on their animal sales to supplement this activity.

Sales of cash crops also represent an alternative to cereal sales for cash generation. Cash cropping was identified as a possible important factor in the previous section of the report. The regression analysis includes cash crop hectareage as an explanatory variable, a proxy for cash crop sales.

Price policy is one avenue open to the government of Burkina Faso in an attempt to increase the amount of surplus marketed by farmers. At present, the government marketing board attempts to provide a minimum purchase price for cereal producers. This analysis attempts to determine the effect of price on cereal sales.

Producer units affect a household's productive potential. Likewise, the number of consumers could be expected to influence the amount of cereal which is sold during the year. Consider two households with the same amount of cereal available for allocation, but with different numbers of consumers. After assuring consumption needs, the household with the smaller number of consumers would have a greater amount of cereal available for alternate uses. Thus, consumer units could be expected to be negatively related to sales.

Based on these variables, three different regression models were used to explain the variation in yearly cereal sales among households (Table 7). The first model is simple, relating yearly sales to animal

TABLE 7  
REGRESSION MODELS USED TO EXPLAIN VARIATION IN YEARLY CEREAL SALES

Model		
First	Second	Third
LANUNITS <sup>a</sup> LHARVEST <sup>b</sup> LCONSUMERS <sup>c</sup>	LANUNITS LHARVEST LCONSUMERS LPRICE <sup>d</sup>	LANUNITS LHARVEST LCONSUMERS LCASHA <sup>e</sup> LPRICE

NOTES: <sup>a</sup>Natural logarithm of stock of goats, sheep and cattle in December 1983. Goats and sheep converted to an equivalent based on a factor of .06 of cattle derived from sales data.

<sup>b</sup>Natural logarithm of total cereal harvest in 1983, calculated from carry-over, inflows, outflows and December 1983 stocks.

<sup>c</sup>Natural logarithm of consumer equivalents calculated using 1984 census information and conversion factors as shown in Appendix 1.

<sup>d</sup>Natural logarithm of mean yearly cereal price.

<sup>e</sup>Natural logarithm of peanuts and cotton hectareage from 1983 cropping season.

units, harvest and consumer units. The second model adds price, while the third adds both cash crop hectarage and price. Because the variables were not normally distributed, all variables were transformed to natural logarithms. Using the ordinary least squares technique, these three models were regressed on the total amount of cereal sales during the October 1983–September 1984 period. The regressions were performed on both a wealth group and village basis, with each household contributing one observation to the regression.

When the regressions were performed utilizing the first and second models on household observations within wealth groupings, no statistically significant results were obtained. The third model was able to explain a statistically significant amount of variation in gross sales only for one of the twelve combinations of models and wealth groups. When regressions were performed by wealth groups using the three models modified to include dummy variables for village effects, the results were similar: the regression procedure did not explain a statistically significant amount of the variation in yearly cereal sales. These findings do not support the initial hypothesis that selling behavior was more homogeneous among wealth groupings than across villages. It appears that the differences between villages overpower any similarity in sales behavior caused by similarities in wealth.

Based on the results of the wealth group–level analysis, each model was re-estimated by village. For Nédogo (Table 8), all three models resulted in statistically significant regressions at the .05 probability level. Inclusion of the price in the second model, and price and cash hectares in the third, did not result in a significant improvement in the explanatory power of either of these models over the base model. The explanatory power of the base model in Nédogo was fairly high, resulting in an  $R^2$  of 51 percent.

The results for Dissankuy were statistically significant, at the .05 level, for all three of the models used (Table 9). The  $R^2$  obtained in each model was 77, 78 and 80, respectively. The reduction in error obtained by using the second model, however, was not sufficient to conclude that it had greater explanatory power than the first, nor did the results support the conclusion that the third model explained more of the variation than did the second.

TABLE 8					
NEDOGO: REGRESSION RESULTS OF THREE MODELS USED TO EXPLAIN VARIATION IN YEARLY CEREAL SALES					
Model 1					
ANALYSIS OF VARIANCE					
<u>Source</u>	<u>DF</u>	<u>Sum of Squares</u>	<u>Mean Square</u>	<u>F Value</u>	<u>R<sup>2</sup></u>
Model	3	20.7265	6.9088	8.233***	.5072
Error	24	20.1394	.8391		
Total	27	40.8659			
PARAMETER ESTIMATES					
<u>Variable</u>	<u>Parameter Estimate</u>	<u>Standard Error</u>	<u>T Statistic</u>		
Intercept	-4.6103	3.0632	-1.505		
LANUNITS	.0324	.1453	.223		
LHARVEST	1.3643	.3746	3.642***		
LCONSUMERS	-.0027	.5008	-.005		
Model 2					
ANALYSIS OF VARIANCE					
<u>Source</u>	<u>DF</u>	<u>Sum of Squares</u>	<u>Mean Square</u>	<u>F Value</u>	<u>R<sup>2</sup></u>
Model	4	20.7938	5.1984	5.957***	.5088
Error	23	20.0721	.8727		
Total	27	40.8659			
PARAMETER ESTIMATES					
<u>Variable</u>	<u>Parameter Estimate</u>	<u>Standard Error</u>	<u>T Statistic</u>		
Intercept	-7.2976	10.1708	-.717		
LANUNITS	.0081	.1720	.047		
LHARVEST	1.3383	.3933	3.402***		
LCONSUMERS	.0145	.5145	.028		
LPRICE	.6179	2.2257	.278		
Model 3					
ANALYSIS OF VARIANCE					
<u>Source</u>	<u>DF</u>	<u>Sum of Squares</u>	<u>Mean Square</u>	<u>F Value</u>	<u>R<sup>2</sup></u>
Model	5	20.7939	4.1588	4.558***	.5088
Error	22	20.0720	.9124		
Total	27	40.8659			
PARAMETER ESTIMATES					
<u>Variable</u>	<u>Parameter Estimate</u>	<u>Standard Error</u>	<u>T Statistic</u>		
Intercept	-7.2880	10.4273	-.699		
LANUNITS	.0081	.1758	.046		
LHARVEST	1.3359	.4437	3.011***		
LCONSUMERS	.0130	.5395	.024		
LCASH	.0031	.2492	.013		
LPRICE	.6190	2.2773	.272		
NOTE: ***significant at .05 level.					
University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.					

TABLE 9					
DISSANKUY: REGRESSION RESULTS OF THREE MODELS USED TO EXPLAIN VARIATION IN YEARLY CEREAL SALES					
Model 1					
ANALYSIS OF VARIANCE					
<u>Source</u>	<u>DF</u>	<u>Sum of Squares</u>	<u>Mean Square</u>	<u>F Value</u>	<u>R<sup>2</sup></u>
Model	3	13.3971	4.4657	10.133***	.7716
Error	9	3.9663	.4407		
Total	12	17.3634			
PARAMETER ESTIMATES					
<u>Variable</u>	<u>Parameter Estimate</u>	<u>Standard Error</u>	<u>T Statistic</u>		
Intercept	1.8202	3.3354	.546		
LANUNITS	.2768	.1159	2.387***		
LHARVEST	1.5545	.4527	3.434***		
LCONSUMERS	-1.5685	.5581	-2.810***		
Model 2					
ANALYSIS OF VARIANCE					
<u>Source</u>	<u>DF</u>	<u>Sum of Squares</u>	<u>Mean Square</u>	<u>F Value</u>	<u>R<sup>2</sup></u>
Model	4	13.4910	3.3727	6.968***	.7770
Error	8	3.8725	.4841		
Total	12	17.3634			
PARAMETER ESTIMATES					
<u>Variable</u>	<u>Parameter Estimate</u>	<u>Standard Error</u>	<u>T Statistic</u>		
Intercept	3.7033	5.5232	.671		
LANUNITS	.3012	.1335	2.255**		
LHARVEST	1.6054	.4884	3.287***		
LCONSUMERS	-1.6491	.6129	-2.691***		
LPRICE	-.4249	.9649	-.440		
Model 3					
ANALYSIS OF VARIANCE					
<u>Source</u>	<u>DF</u>	<u>Sum of Squares</u>	<u>Mean Square</u>	<u>F Value</u>	<u>R<sup>2</sup></u>
Model	5	13.8211	2.7642	5.462***	.7960
Error	7	3.5423	.5060		
Total	12	17.3634			
PARAMETER ESTIMATES					
<u>Variable</u>	<u>Parameter Estimate</u>	<u>Standard Error</u>	<u>T Statistic</u>		
Intercept	3.4516	5.6558	.610		
LANUNITS	.2459	.1527	1.610		
LHARVEST	1.6180	.4996	3.239***		
LCONSUMERS	-1.7529	.6397	-2.740***		
LCASH	.2057	.2546	.808		
LPRICE	-.3810	.9881	-.386		
NOTES: ** and *** indicate a level of significance of .10 and .05, respectively.					
University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.					

The results for both Poédogo and Diapangou were puzzling. None of the models resulted in a statistically significant regression (Tables 10 and 11). In Poédogo, the third model resulted in the largest F ratio, indicating that the price and cash hectare variables may be important in explaining cereal sales. The small number of observations in the Poédogo data undoubtedly makes estimation of a regression equation difficult. For the Diapangou data, the first model came the closest to explaining a significant amount of the variation in sales resulting in an F statistic of .2385. All of the Diapangou households had animal traction, which may affect their sales behavior in some way not taken into account by the models.

For Nédogo and Dissankuy, the regression results indicate that between 51 and 77 percent of yearly cereal sales could be explained by the regression model based on animal stocks, harvest and consumer units. In Nédogo, of those variables tested, only the 1983 harvest was seen to have a statistically significant coefficient. The regression equation thus reduces to include only this variable. Of the four villages studied, Nédogo was located in the least productive area. In 1983, Nédogo households harvested the smallest amount of cereals of all five villages. Nédogo is located on the heavily populated Central Plateau, receives the least rainfall, and has the least fertile soils. The regression results indicate, that in the Nédogo situation, cereal sales are seen to be highly dependent on output.

In Dissankuy, both the animal and harvest variables had significant and positive coefficients. Dissankuy households with larger stocks of animals were characterized as having a greater amount of cereal sales. This finding supports the hypothesis that high levels of cereal selling and animal stocks are complementary. The consumer unit variable was also significant in Dissankuy and had a negative coefficient; in this village, households which were more likely to sell had a smaller number of mouths to feed. This result supports the hypothesis that households with larger consumption requirements are less able to sell than those whose consumption requirements are more limited, at least in the Dissankuy context. In situations where agricultural conditions are better, output considerations are important, but so are decisions as to the relative number of consumers to be satisfied.

TABLE 10					
POEDOGO: REGRESSION RESULTS OF THREE MODELS USED TO EXPLAIN VARIATION IN YEARLY CEREAL SALES					
Model 1					
ANALYSIS OF VARIANCE					
<u>Source</u>	<u>DF</u>	<u>Sum of Squares</u>	<u>Mean Square</u>	<u>F Value</u>	<u>R<sup>2</sup></u>
Model	3	4.3118	1.4373	.871 <sup>a</sup>	.1573
Error	14	23.0960	1.6497		
Total	17	27.4078			
Model 2					
ANALYSIS OF VARIANCE					
<u>Source</u>	<u>DF</u>	<u>Sum of Squares</u>	<u>Mean Square</u>	<u>F Value</u>	<u>R<sup>2</sup></u>
Model	4	10.2306	2.5577	1.936 <sup>a</sup>	.3733
Error	13	17.1772	1.3213		
Total	17	27.4078			
Model 3					
ANALYSIS OF VARIANCE					
<u>Source</u>	<u>DF</u>	<u>Sum of Squares</u>	<u>Mean Square</u>	<u>F Value</u>	<u>R<sup>2</sup></u>
Model	5	12.5925	2.5185	2.040 <sup>a</sup>	.4594
Error	12	14.8154	1.2346		
Total	17	27.4078			
NOTE: <sup>a</sup> Not significant at .10 level.					
University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.					

TABLE 11					
DIAPANGOU: REGRESSION RESULTS OF THREE MODELS USED TO EXPLAIN VARIATION IN YEARLY CEREAL SALES					
Model 1					
ANALYSIS OF VARIANCE					
<u>Source</u>	<u>DF</u>	<u>Sum of Squares</u>	<u>Mean Square</u>	<u>F Value</u>	<u>R<sup>2</sup></u>
Model	3	3.2457	1.0819	1.540 <sup>a</sup>	.2042
Error	18	12.6472	.7026		
Total	21	15.8929			
Model 2					
ANALYSIS OF VARIANCE					
<u>Source</u>	<u>DF</u>	<u>Sum of Squares</u>	<u>Mean Square</u>	<u>F Value</u>	<u>R<sup>2</sup></u>
Model	4	3.4732	.8683	1.189 <sup>a</sup>	.2185
Error	17	12.4197	.7306		
Total	21	15.8929			
Model 3					
ANALYSIS OF VARIANCE					
<u>Source</u>	<u>DF</u>	<u>Sum of Squares</u>	<u>Mean Square</u>	<u>F Value</u>	<u>R<sup>2</sup></u>
Model	5	3.5619	.7124	.924 <sup>a</sup>	.2241
Error	16	12.3310	.7707		
Total	21	15.8929			
NOTE: <sup>a</sup> Not significant at .10 level.					
University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.					

Cotton production is an important activity in Dissankuy. For the sample as a whole 16 percent of the cropped area in 1983 was devoted to the production of cotton. It is surprising that the cotton hectare variable did not result in a significant coefficient. An alternative formulation may have yielded a different result. Cotton sales may be important as an alternative source of cash income. Use of the value of cotton sales rather than cotton hectares in a regression model may be more useful in explaining the cereal sales. This issue needs further research.

The descriptive analysis of Poédogo sales data indicated that more rice was sold during 1984 than was harvested in 1983. Rice was also an important crop in terms of sales volume. In order to investigate the role of rice in Poédogo sales, the regression models were re-estimated for rice sales, and for grain sales of all cereals except rice. The harvest and price dependent variables were recalculated to take into account only those crops which contributed sales data to the dependent variable.

For rice sales, the base model did not predict a statistically significant amount of the variation in sales (Table 12). Both the second and third models produced statistically significant regressions of rice sales (at the .05 level), although there was not sufficient evidence to conclude that the third model explained a greater amount of variation than the second.

Utilization of the second model, which includes price, yielded an  $R^2$  of 84 percent. The intercept term, as well as the price, harvest and consumer equivalent terms all had significant coefficients. Since such a large share of rice harvest is marketed, it is not surprising that the coefficient on price should be significant and positive. The positive coefficient on the harvest variable indicates that large rice harvests are associated with large rice sales. This is both an obvious and important conclusion. As in Nédogo and Dissankuy, harvest is an important variable for explaining rice sales (in Poédogo).

It has been argued by Haessel that in self-sufficient villages the question of price endogeneity is important to a model of marketed surplus. Inclusion of both output and prices as exogenous variables,

TABLE 12					
POEDOGO: REGRESSION RESULTS OF THREE MODELS USED TO EXPLAIN VARIATION IN YEARLY RICE SALES					
Model 1					
ANALYSIS OF VARIANCE					
<u>Source</u>	<u>DF</u>	<u>Sum of Squares</u>	<u>Mean Square</u>	<u>F Value</u>	<u>R<sup>2</sup></u>
Model	3	6.0093	2.0031	2.790 <sup>a</sup>	.4819
Error	9	6.4619	.7180		
Total	12	12.4713			
Model 2					
ANALYSIS OF VARIANCE					
<u>Source</u>	<u>DF</u>	<u>Sum of Squares</u>	<u>Mean Square</u>	<u>F Value</u>	<u>R<sup>2</sup></u>
Model	4	10.4976	2.6244	10.637***	.8417
Error	8	1.9737	.2467		
Total	12	12.4713			
PARAMETER ESTIMATES					
<u>Variable</u>	<u>Parameter Estimate</u>	<u>Standard Error</u>	<u>T Statistic</u>		
Intercept	-31.5684	7.4922	-4.214***		
LANUNITS	-.0581	.2030	-.286		
LHARVEST	.2173	.0669	3.249***		
LCONSUMERS	2.0071	.5556	3.613***		
LPRICE	5.0840	1.1920	4.265***		
Model 3					
ANALYSIS OF VARIANCE					
<u>Source</u>	<u>DF</u>	<u>Sum of Squares</u>	<u>Mean Square</u>	<u>F Value</u>	<u>R<sup>2</sup></u>
Model	5	10.5059	2.1012	7.484***	.8424
Error	7	1.9654	.2808		
Total	12	12.4713			
PARAMETER ESTIMATES					
<u>Variable</u>	<u>Parameter Estimate</u>	<u>Standard Error</u>	<u>T Statistic</u>		
Intercept	-31.3062	8.1369	-3.847***		
LANUNITS	-.0681	.2243	-.304		
LHARVEST	.2118	.0782	2.708***		
LCONSUMERS	2.0052	.5928	3.383***		
LCASH	-.0198	.1154	.172		
LPRICE	5.0340	1.3045	3.859***		
NOTES: <sup>a</sup> Not significant at .10 level.					
***Significance at .05, respectively.					
University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1985.					

could lead to biased ordinary least squares estimates. A re-estimation of his model using two stage least squares shows that some of the results differ substantially (Haessel 1975). Both price and output were retained as explanatory variables using ordinary least squares procedures in the model. Further analysis would suggest the use of two stage least squares procedures. Since the rice harvest was smaller than rice sales, however, the price of rice may be exogenous to some degree.

Regressing yearly cereal sales for crops other than rice did not result in a significant regression for any of the three models. As was the case when total sales were the dependent variable, the model containing price and cash hectarage resulted in the largest F value. Poédogo is located in a fertile area, often called the dolo capital of Burkina Faso because of the importance sorghum beer production as a commercial activity. Poédogo is also located near an active market. For these reasons, it is likely that price plays a greater part in the determination of cereal sales than in the other villages. The largest share of non-rice sales was accounted for by red sorghum, it is logical to assume that sales behavior for red sorghum contains elements which were not contained in any of the regression models. One possibility is that the data may not be adequately reflecting the use of red sorghum in beer production. The sample size may also be a problem limiting the usefulness of the models.

In an attempt to explain cereal sales behavior in Diapangou and Poédogo, the observations for these two villages were combined and the three models re-estimated for non-rice sales. The results indicated that neither the first or second models were able to explain a significant amount of the variation in yearly non-rice cereal sales. Surprisingly, use of the third model resulted in a significant regression, with a significant and positive coefficient for cash crop hectares (Table 13). The resultant  $R^2$  of 27 percent indicated that the explanatory power of the model was moderately high. These results provide additional evidence to reject the hypothesis that cash crop hectarage (and by proxy, cash crop sales) are negatively associated with cereal sales. This seems in contradiction to the descriptive statistics on cereal sales in Dissankuy. The explanation may relate to the different roles of cotton and peanuts as cash crops.

TABLE 13					
POEDOGO AND DIAPANGO: REGRESSION RESULTS OF THREE MODELS USED TO EXPLAIN VARIATION IN YEARLY NON-RICE SALES					
Model 1					
ANALYSIS OF VARIANCE					
<u>Source</u>	<u>DF</u>	<u>Sum of Squares</u>	<u>Mean Square</u>	<u>F Value</u>	<u>R<sup>2</sup></u>
Model	3	4.8358	1.6120	1.196 <sup>a</sup>	.1038
Error	31	41.7658	1.3473		
Total	34	46.6016			
Model 2					
ANALYSIS OF VARIANCE					
<u>Source</u>	<u>DF</u>	<u>Sum of Squares</u>	<u>Mean Square</u>	<u>F Value</u>	<u>R<sup>2</sup></u>
Model	4	5.9054	1.4763	1.088 <sup>a</sup>	.1267
Error	30	40.6962	1.3565		
Total	34	46.6016			
Model 3					
ANALYSIS OF VARIANCE					
<u>Source</u>	<u>DF</u>	<u>Sum of Squares</u>	<u>Mean Square</u>	<u>F Value</u>	<u>R<sup>2</sup></u>
Model	5	12.5150	2.5030	2.129 <sup>**</sup>	.2686
Error	29	34.0866	1.1754		
Total	34	46.6016			
PARAMETER ESTIMATES					
<u>Variable</u>	<u>Parameter Estimate</u>	<u>Standard Error</u>	<u>T Statistic</u>		
Intercept	-1.9398	5.3016	-.366		
LANUNITS	.2366	.1760	1.344		
LHARVEST	.0258	.2927	.088		
LCONSUMERS	.1788	.5955	.300		
LCASH	-.3322	.1401	2.371 <sup>***</sup>		
LPRICE	.8312	.9319	.892		
NOTES: <sup>a</sup> Not significant at .10 level. <sup>**</sup> and <sup>***</sup> indicate a level of significance of .10 and .05 respectively.					
University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.					

### 3.3 INTRA-ANNUAL BEHAVIOR

The cereal grain market in Burkina Faso is highly seasonal. Changing prices could be expected to have an impact on seller behavior. This section seeks to describe the intra-annual behavior of the farming households studied. Rainfall patterns in Burkina Faso result in distinct dry and wet seasons. Harvest of cereal grains generally takes place from October through December. From then on, cereal stocks fall, reaching their pre-harvest low during the soudure or "hungry period" of July-September. Despite efforts to stabilize prices by the government marketing board, prices fluctuate widely within a given agricultural year, in response to the periodicity of rainfall, and the resultant effects of supply and demand in the marketplace. Based on these patterns, the agricultural year can be divided into four periods. These are the harvest, dry, hot, and wet seasons corresponding to the periods October-December, January-March, April-June, and July-September, respectively. This division follows that of Sherman (1974).

Observed patterns of selling behavior differed for the four villages studied (Table 14). In Nédogo, the largest volume of cereals were sold during the January-March period, representing 40 percent of the total sold for that village. The July-September period accounted for the largest amount of cereal sales on a per selling household basis. This period had lower sales volume but resulted in a larger per household figure due to a smaller number of selling households. The pattern in Diapangou was similar to that in Nédogo. In these villages, fewer households sold in the hungry period (July - September), but each sold a larger amount than in any other period. This finding suggests that few households sell when prices are most favorable. Those households that can sell during the favorable price period, however, market a larger quantity than that sold on average during the rest of the year.

In Poédogo, the largest sales took place during the 1983 harvest period. These sales represented 48 percent of the yearly total. In terms of selling households, the harvest period also accounted for the largest share of sales, although only slightly less was marketed from July-September. The data from Dissankuy present more of a mixed

TABLE 14					
GROSS CEREAL SALES DISAGGREGATED BY QUARTERS FOR FOUR VILLAGES IN BURKINA FASO					
Village	Quarter				Yearly Total <sup>a</sup>
	October-December	January-March	April-June	July-September	
Nédogo	20 <sup>b</sup>	27	18	10	
	1,749 <sup>c</sup>	3,216	1,420	1,648	8,033
	21.77 <sup>d</sup>	40.03	17.68	20.52	100
	87.45 <sup>e</sup>	119.11	78.89	164.80	107.11
Poédogo	17	15	11	7	
	4,204	2,091	868	1,636	8,799
	47.78	23.76	9.86	18.59	100
	247.29	139.40	78.91	233.71	175.98
Dissankuy	4	9	6	9	
	790	1,640	830	1,599	4,859
	16.26	33.75	17.08	32.91	100
	197.50	182.22	138.33	177.67	173.54
Diapangou	7	20	5	7	
	1,024	5,196	845	2,700	9,765
	10.49	53.21	8.65	27.65	100
	146.29	259.80	169.00	385.71	250.38

NOTES: <sup>a</sup>October 1983-September 1984.  
<sup>b</sup>Number of households selling in period.  
<sup>c</sup>Sum in kg.  
<sup>d</sup>Percent of yearly total.  
<sup>e</sup>Gross sales per selling household in kg.

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picture. Slightly less cereal was sold during the July-September period than from January to March (1,599 kg vs. 1,640 kg), but the same number of households sold cereal grains in both periods, resulting in similar volume per selling household. As in Poédogo, the largest amount of cereal sales per selling household took place during the October to December period.

Dry period sales in Dissankuy could be influenced by the timing of payments for cotton production. Should these payments be late, cereal sales would represent an alternative for cash generation. The data do show that seven of the nine dry season sellers were also cotton producers. Without data on expenditures and cotton remittances, however, no definitive test of this hypothesis is possible.

The timing of a given household's cereal sales could be expected to be influenced by that household's wealth position. Wealth represents alternative resources available to answer cash needs. Wealthier households may be better able to take advantage of fluctuations in market prices. For all four wealth groups, the greatest number of households sold during the January-March period (Table 15). Except for the wealthiest group, the harvest period represented the second most likely time for a household to sell. Although the greatest proportion of selling households were active January-March, this period accounted for the largest volume of cereal sold only for the poor and wealthiest groups. The lower middle group sold both the largest volume of cereals and the largest volume per selling household during the low-price October-December period, but sold only slightly less (197 kg. vs. 216 kg.) per selling household from July-September than in the harvest period. The data indicate that although fewer households in the lower middle and upper middle wealth groups sold in the July-September period the size of the sale was relatively larger than during other periods of the year.

With regard to the higher price periods, there is some indication that the wealthier households were more active sellers than the poorest households. During the April-June period, the wealthiest group was responsible for the largest amount of cereal sales, both in terms of volume as well as on a per selling household basis. Although the upper

TABLE 15					
GROSS CEREAL SALES DISAGGREGATED BY QUARTERS FOR EACH WEALTH GROUP					
Village	Quarter				Yearly Total <sup>a</sup>
	October-December	January-March	April-June	July-September	
Poorest	8 <sup>b</sup>	13	4	4	
	449 <sup>c</sup>	1,206	85	408	2,147
	20.87 <sup>d</sup>	56.17	3.96	19.00	100
	56.00 <sup>e</sup>	92.77	21.25	102.00	74.03
Lower Middle	18	21	16	9	
	3,896	2,962	1,224	1,769	7,851
	39.55	30.07	12.43	17.96	100
	216.44	141.05	76.50	196.56	153.92
Upper Middle	17	21	12	14	
	2,150	3,583	1,008	4,014	10,755
	19.99	33.31	9.37	37.32	100.00
	126.47	170.62	84.00	286.71	168.05
Wealthiest	5	16	8	6	
	1,273	4,392	1,646	1,392	8,703
	14.63	50.47	18.91	15.99	100
	254.60	274.50	205.75	232.00	248.66
NOTES: <sup>a</sup> October 1983-September 1984.					
<sup>b</sup> Number of households selling in period.					
<sup>c</sup> Sum in kg.					
<sup>d</sup> Percent of yearly total.					
<sup>e</sup> Gross sales per selling household in kg.					
University of Michigan, The Dynamics of Grain Marketing in Burkina Faso, 1986.					

middle wealth group sold a smaller volume than the lower middle group, the average amount sold was higher. The April-June period was also the time in which the second largest proportion of wealthiest households were selling.

In July-September when prices were highest, the upper middle wealth group had the greatest number of households able to sell and sold more than any other wealth group. The upper middle group sold both the greatest volume and the largest amount per selling household during the high-price July-September period than at any other time of the year. It seems significant that for all but the poorest group, at least 30 percent of the households (who sold at some time in the year) were involved in marketing activity during the high-price July-September period. It is also interesting that the upper middle group had the largest proportion of sellers active from July-September. This observation, along with the fact that this group sold the largest volume and amount per household in the July-September period, identifies the upper middle group as being the most able to take advantage of price fluctuations.

The lower middle wealth group appears to have the greatest frequency of sales. In this group, 56 percent of the selling households had sales in three of the four time periods studied, compared with 46 percent and 38 percent for the upper middle and wealthiest groups, respectively. This finding indicates that households' in the lower and upper middle groups were active in a greater number of periods than the wealthiest group. This is a strategy consistent with the need for higher turnover, perhaps related to these households lower wealth position.

In summary, these results provide some evidence to support the conclusion that wealth is associated with selling in higher price periods. It was not clear, however, that the wealthiest households were consistently selling greater aggregate volumes or greater volumes per selling households during the higher price periods. The measure of wealth used in this analysis was determined to a large degree by animal stocks. The behavior of the wealthiest group may reflect to a greater extent the influence of the animal market than that of the cereal grain market. In addition, it should be remembered that while differences exist in wealth position among households, huge discrepancies in wealth status are somewhat rare.

## CHAPTER 4

### CONCLUSIONS AND POLICY IMPLICATIONS

Analysis of yearly cereal sales for the October 1983–September 1984 period revealed that although nearly 80 percent of sample households sold, absolute levels are low. In addition, large variations exist across households. This data set contains a small number of observations and, therefore, is very sensitive to the influence of individual household observations. The variation was decreased somewhat by the elimination of extreme outliers.

The analysis of cereal sales revealed two interesting and potentially important issues. The first is the effect of harvest or output on cereal sales. In Nédogo, located on the Central Plateau, harvest was found to be the primary determinant of cereal sales. Of the four villages, Nédogo has the least favorable rainfall and soil fertility conditions. In such a situation, output is probably the most limiting factor in the quantity of cereal sold. This conclusion is basic but also potentially significant. It suggests that in marginal conditions, output may need to be increased before any significant increase in sales can be accomplished.

In Dissankuy, which is characterized by more productive conditions of soil fertility and rainfall, output was also seen to be a major determinant of cereal sales. In this village, a large proportion of the cultivated area was devoted to the production of cash crops. Faced with a given endowment of labor and land, a household which devotes resources to cash cropping will have a lesser ability to produce cereal crops. Sales of cereal grains may therefore depend heavily on the harvest, once consumption needs of the household are taken into account. This may explain the importance of the consumer unit variable in the Dissankuy results. For Dissankuy, the results suggest a hypothesis for further study: what is the influence of cotton production on cereal sales? In this analysis, it was not possible to make a definitive determination. Indications from the combined Poédogo–Diapangou results indicate that peanut sales are directly related to cereal sales. It appears that different cash crops are affecting cereal sales differently. Once the relationship of cash cropping to cereal sales is established, policy

makers will be faced with the issue of how to best influence the allocation of fertile land between cash and food crop production.

The results for Poédogo are important in terms of their implications for price policy. Price and output were seen to be important variables in explaining the variation in rice sales among farming households. Analysis also indicated that rice sales exceeded rice harvest. Thus price was seen to be important when a large share of output is marketed.

Price may very well be a determinant of the decision of how much to sell for crops which have similar proportions of sales to own production, and in areas which have similar commercial opportunities to those found in Poédogo. Price policy would represent a potential area for government intervention designed to increase the amount of cereal sales in this case. It remains to be seen, however, whether the functioning of the market does not produce prices which are higher than those the government is able to support. In addition, the influence of price on output should be further explored.

Considerable differences in sales behavior were found across villages. In as much as the four villages studied are representative of regions and regional sales behavior in Burkina Faso, these differences need to be taken into account in the formulation and implementation of marketing policy.

A brief descriptive analysis of intra-annual behavior indicated that there are considerable differences in the volume of cereal sales within a given year. Policies which take into account the intra-annual variations in price and supply would be more effective in achieving their objective than those that do not.

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APPENDIX 1

CONVERSION FACTORS USED TO CALCULATE PRODUCER AND  
CONSUMER EQUIVALENTS

Age	Producer		Consumer	
	Male	Female	Male	Female
Years				
0 - 4	0	0	.20	.20
5 - 9	.25	.25	.50	.50
10 - 15	.80	.50	.75	.70
16 - 55	1.00	.80	1.00	.75
56 +	.70	.50	1.00	.75

SOURCE: Matlon, Peter J. 1977. "The size distribution, structure, and determinants of personal income among farmers in the north of Nigeria." Ph.D. dissertation, Cornell University.

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