CFC Project CFC/FIGM/06
Improvement of Livestock Marketing and Regional Trade in West Africa

A project jointly implemented by CILSS and ILRI in six West African countries

Final Report for Component 2:
The determination of appropriate economic incentives and policy framework to improve livestock and intra regional trade.

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December, 2003

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LIST OF ABBREVIATIONS AND ACRONYMS

ADB	African Development Bank
APEX	Animal Productivity and Export Project
CEBV	Economic Community for Livestock and Meat
CFA*	Communauté Financiere Africaine
CFC	Common Fund for Commodities
CILSS	Comité Permanent Inter-Etats de Lutte contre la Sechéresse dans le Sahel
CLUSA	Cooperative League of the United States of America
CNC	Cadre National de Concertation
COBAS	Cooperative de Commerce de Bétail de Sikasso
ECOWAS	Economic Community of West African States
EU	European Union
FERAP	Projet de Fluidification des Echanges et de Rapproachement des Politiques Agro-alimentaires
ILRI	International Livestock Research Institute
NTB	Non-Tariff Barriers
ODC	Other Duty Charges
OMBEVI	Office Malien de Bétail-Viande
PAPA	Programme de Amelioration de Production Animale
SSA	Sub-Saharan Africa
UEMOA/WAEMU	Union Économique et Monetaire d'Ouest Afrique/West African Economic and Monetary Union
UNACEB	Union Nationale des Associations de Commercants et Exportateurs de Bétail du Burkina

*One US $ was equivalent to 659 FCFA in November 2002 based on exchange rates listed in the Financial Times of London. This exchange was used throughout this report in converting FCFA to dollar values.

ACKNOWLEDGEMENTS

Many colleagues, too numerous to mention, contributed in various ways to the initiation of this project (CFC/FIGM/06) and the completion of this component of the project which focussed on policy issues. Nevertheless, the following individuals deserve to be mentioned for their unstinting support and encouragement.

Ralph von Kaufmann was instrumental in initiating contact between ILRI and CFC. His persistence and encouragement made possible the approval of this project which was the forerunner of ILRI projects funded by the CFC. Seydou Sidibe (then of CILSS) and I took up the responsibility of conceptualizing and writing up the project with useful insights and encouragement from Concepcion Calpe (then Secretary to the FAO Inter-Governmental Group on Meat) and Caleb Dengu (CFC). Seydou Sidibe's vast knowledge of the livestock sector in West Africa and his unique sense of humour sustained us during the difficult days of re-writing the penultimate version of the project proposal in Amsterdam. Dramane Coulibaly and Rasmane Ouédraogo (CILSS) were very helpful in providing assistance for the field activities, particularly in Burkina Faso. The field activities in Sikasso, Mali could not have been accomplished without the assistance provided by ACOD-NETASSO, a local NGO, and its coordinator, Mohamed Ag Akeratane. Special thanks are due to all the livestock producers, traders and brokers who participated in the various surveys and the enumerators who worked diligently throughout the survey period. Government livestock policy advisers in the study countries, particularly Kwame Asafu-Adjei (Ghana), Marcel Koffi-Koumi (Côte d'Ivoire), Michel P. Ouedraogo (Burkina Faso), Uka Amogu (Nigeria) and Abderamane Coulibaly (Mali) generously shared their experiences and contributed ideas to this report.

The views and ideas expressed in the report are those of the authors and should not be attributed to ILRI, CFC, CILSS and all the individuals mentioned here. The authors bear responsibility for any error contained in the report.

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Economic, institutional and policy constraints to livestock marketing and trade in West Africa

EXECUTIVE SUMMARY

Livestock trade constitutes an important economic activity in West Africa with livestock representing the highest valued agricultural commodity in intra-regional trade. This trade has historically linked the Sahelian countries (e.g. Burkina Faso, Mali and Niger) in the arid and semi-arid parts of the region as exporters of livestock to the humid coastal countries in the south (e.g. Côte d'Ivoire, Ghana and Nigeria) as net importers. Differences in the biophysical production environment and in average incomes between the Sahel and coastal areas promoted this trade. This spatial dispersion of production and consumption has ensured a thriving intra-regional trade in live animals which in cattle increased in real value terms from US$ 13 million in 1970 to US$ 150 million in 2000 (FAOSTAT, 2002). Private entrepreneurs operating through a marketing chain involving collection, regrouping and terminal markets carry out the trade in live animals. Although the marketing chain is well known, the economic and institutional barriers to livestock marketing are often underrated at considerable cost to livestock sector development. Intra-regional trade is also constrained by inappropriate sectoral and trade policies. The negative impacts of these policies on domestic and cross-border livestock trade often go unnoticed due to lack of quantitative estimates of losses in revenue and national income arising from the implementation if inappropriate policies. With 47 million cattle mostly owned by smallholder pastoralists and farmers, the potential exists to improve rural livelihoods and economic development through well functioning livestock markets and promotion of intra-regional trade.

In 1999, a project funded by the Common Fund for Commodities (CFC) was initiated with two components - a market infrastructure development component handled by CILSS and a policy research component handled by ILRI. This report is on the latter component.

Primary data collection for the study spanned a 2-year period and involved: a) weekly surveys of transactions in 3 major frontier livestock markets – Sikasso (Mali), and Bittou and Niangoloko (Burkina Faso); b) two detailed surveys of livestock traders operating in the above markets; and c) interviews and interactions with policy makers and market association groups.

A wide range of methods and tools including partial budgets, econometric analysis and GIS was deployed for data analysis to obtain a thorough understanding of the workings of markets, factors influencing prices, extents and effects of variations in livestock flows and prices on producers, traders and intra-regional trade. The costs and benefits of livestock trade were estimated and the study highlighted the constraints and opportunities for improving cross-border livestock trade as a means of facilitating informed policy decision making and enhancing the livelihoods of livestock producers and market agents.

The main findings were as follows:

i. Domestic and cross-border livestock marketing channels in the study countries were found to be simple and uncomplicated though they varied slightly from one location to another. The Sikasso case presented the simplest and least sophisticated of the marketing channels with a high proportion of livestock directly exchanged between producers and export traders, while the Niangoloko market case presented the most complex case where all traded animals passed through collection and frontier markets before export. Even in this case, where the marketing chain is longer, it was only in terms of the number of marketing agents because the principal activity remained the transfer of animals from one agent to another in different locations.

ii. There were no regulations compelling producers to sell or buy from particular markets (farm gate, collection or frontier) or through particular participants (e.g. the small itinerant trader, agent, broker or big export trader). As a result, the volume of livestock flows through the various channels mainly reflected attempts by smallholder producers to get the most for their animals and competitive efforts on the part of traders to secure the best possible deals.

iii. While all traders (small-, medium- and large-scale) participated in the domestic segment of the marketing chain, only large-scale traders were involved in the export segment reflecting the huge initial capital investment involved in the export trade. Inadequate own-capital and limited access to credit effectively serve as market entry barriers to small traders who would like to get involved in cross-border livestock trade.

iv. Livestock trade is still highly personalised, lacking in objective standards for pricing, negotiation and enforcement of contractual obligations. This often compelled traders to travel long distances to do business with known producers with resultant high monetary and time costs.

v. Although the marketing channels were found to be relatively unsophisticated there were a number of constraints to efficient functioning of markets arising from cumbersome formalities, exorbitant fees and taxes (both legal and illegal) collected along the trade routes, lack of well-marked out cattle corridors for trekking animals to frontier markets, occasional shortage of trucks for moving animals to terminal markets, a system of selling on credit, particularly to butchers, lack of market information and limited own-capital and access to formal credit sources. These constraints increase actual market and transactions costs and sometimes prevent market exchange from taking place.

vi. Local-level market associations (e.g. COBAS in Mali) and other institutions at the national level (e.g. UNACEB in Burkina Faso) have emerged in recent years to facilitate livestock trade and lower marketing costs.

vii. Buyers were wiling to pay a premium for heavily built, castrated zebu cattle in excellent body condition. However, smallholder producers are not yet taking advantage of this opportunity as only about 10% of the cattle traded were rated as being in excellent body condition even though the results showed that efforts to finish animals properly and present them in good condition would be adequately compensated.

viii. Analysis showed that export traders offered a higher price for the same type of animal than itinerant traders and collectors indicating that their animals, producers would benefit more if they deal directly with export traders.

ix. Two distinctly marked periods of sale of animals were observed: i) October – March, the off-peak period and ii) April to September, the peak period. It was observed that more animals were available for sale and prices offered for them were higher during the peak sales period than in the off-peak period.

x. For all livestock species, there were variations in the number available for sale and in their prices, particularly during the off-peak season with small ruminant prices being more volatile.

xi. The seasonal variation in livestock flows and prices affected traders' profits. It appeared that traders made higher profits in the peak period than in the off-peak season. This is one occasion when both livestock producers and traders benefited by doing business during the peak sales period.

xii. Analysis of market integration showed that livestock markets supplying cattle to the Bittou frontier market were largely related but probably not closely integrated.

xiii. Cross-border transportation and handling costs accounted for between 5.8% and 6.9% of the final price of cattle sold in Abidjan and Accra.

xiv. Official duties and taxes were high, particularly along the Burkina Faso-Côte d'Ivoire corridor (6.6% of final cost of animal), compared with 2.6% of the final price of animals along the Mali- Côte d'Ivoire corridor and 4.1% of the final price of animal along the Burkina Faso-Ghana corridor.

xv. Cross-border traders' margins ranged from 8.9% of the final price of animal along the Djefoula-Niangoloko-Port Bouet corridor to 12.4% of the final price of animal along the Niena-Sikasso-Port Bouet corridor. These margins were more than double the margins made by traders operating in the domestic segment of the marketing chain.

xvi. When the overall cost of cross-border trade (including transportation and handling, official duties and illicit taxes etc) was decomposed, it was found that transportation and handling was the single highest cost item accounting for 44%, 48% and 36% of the total cost in Sikasso, Bittou and Niangoloko, respectively, while transactions costs (made up of purchase and sales commission, official

duties and taxes and illicit fees) accounted for 44%, 41% and 56% of the total cost in Sikasso, Bittou and Niangoloko, respectively. It is thus clear that transportation and transactions costs constitute major constraints to cross-border livestock trade.

xvii. Tariffs have been reduced in all participating countries and similar progress has been towards tariff structure simplification.

xviii. The elimination of non-tariff barriers (NTB) and illicit taxes has been particularly problematic with no country achieving a significant measure of success, with the possible exception of Ghana.

xix. The pace of progress towards trade liberalisation has been particularly uneven in the case of the reduction of other duties and charges (ODC). While Côte d'Ivoire, Ghana, Mali and Niger have implemented reduction measures, not much has been achieved in the cases of Burkina Faso and Nigeria.

xx. Harmonisation of livestock trade policies within the study countries will need to build on the progress that has been made in UEMOA member states on macroeconomic convergence, adoption of a customs union and streamlined indirect taxation procedures. At a regional level, this call for strong political will on the part of governments in the larger ECOWAS grouping to extend what has been achieved in the UEMOA group to the entire 14 member countries in the regional economic community.

From these findings, the following major conclusions were drawn:

i. Livestock marketing channels in the central corridor of West Africa are made up of domestic and cross-border segments that function reasonably well. Performance in the cross-border segment could be improved through the provision of credit to overcome market-entry barriers to small-scale traders caused by insufficient own-capital and lack of access to credit.

ii. In addition to lack of credit, livestock trade in the participating countries is constrained by high transportation and handling costs, high official and unofficial duties and taxes, occasional shortage of trucks and lack of market information.

iii. Considering the low proportion of marketed animals that fully met the expectations of export traders and commanded good prices, opportunities exist for livestock traders to fatten animals through strategic supplementation in order to market well finished animals in good condition. Local-level market associations could help to create awareness and help their members to take advantage of this opportunity.

iv. Progress has been made in policy reforms aimed at liberalising livestock trade among the participating countries but the pace has been uneven and this continues to hamper intra-regional trade in livestock. Much can still be done to facilitate and improve intra-regional livestock trade.

The findings and conclusions of this study suggest three major policy thrusts namely: i) facilitating access to credit for livestock trade; ii) empowering livestock producers through provision of information on buyer preferences and market conditions (i.e. animal prices, supply and demand levels); and iii) lowering marketing costs associated with cross-border trade.

Economic, institutional and policy constraints to livestock marketing and trade in West Africa

1. INTRODUCTION

1.1 Project Background

Strong intra-regional trade linkages characterize the livestock sector in West Africa. Livestock represent the highest valued agricultural commodity in intra-regional trade. Countries in the Sahelian zone, such as Burkina Faso, Mali and Niger, have natural conditions that favour livestock production and this enable them to produce surplus animals, which are exported to coastal countries such as Côte d'Ivoire, Ghana and Nigeria, where average per capita income is relatively higher than in the Sahelain zone. Private entrepreneurs operating through domestic and cross-border marketing channels involving collection, regrouping and terminal markets carry out this trade. In recent times, livestock trade has been constrained by economic and institutional barriers as well as inappropriate policies. These constraints prevent producers from obtaining remunerative prices for their animals and reduce the efficiency and welfare gains of trade to all market participants.

To provide a context within which infrastructural, institutional and policy constraints can be reduced to enable smallholder producers benefit more from their production activities, CILSS and ILRI jointly approached the Common Fund for Commodities in 1998 to finance a project aimed at improving livestock marketing and intra-regional trade in West Africa. The project was initiated in 1999 with two components, a market infrastructure development component handled by CILSS and a policy research component handled by ILRI. Other partners involved in this project include national and local-level organizations such as the Union Nationale des Associations de Commercants et Exportatuer de Betail du Burkina (UNACEB), Cooperative de Commerce de Bétail du Sikasso (COBAS) and Livestock Traders Associations in Ghana and Nigeria .

1.2 Objectives of the Policy Research Component

The overall objective of the policy research component of this project is to analyse the economic, institutional and policy constraints to livestock marketing and trade in order to provide a basis for new policy interventions to improve market efficiency and intra-regional livestock trade. The specific objectives are:

- to assess the economic and institutional problems in livestock marketing, using three frontier markets as case studies, in order to identify the sources and magnitudes of inefficiencies and measures to reduce them;

- to identify the sectoral and trade policy constraints to intra-regional livestock trade and determine policy strategies to reduce their negative effects; and

- to develop an appropriate framework to streamline livestock trade policies among participating countries and to disseminate policy results to decision makers.

This report addresses these objectives by providing answers to certain questions implicit in the objectives. To make for logical presentation, these questions are organised into four broad groups as follows:

i. Livestock marketing operations: What channels are used for livestock marketing? Who are the participants in these channels? What are their characteristics and how are livestock flows through the channels affected by the behaviour of these participants?

ii. Price determination in domestic markets: What are the underlying determinants of livestock prices? How do variations in prices affect livestock producers, traders and influence cross-border trade?

iii. Costs and returns to livestock marketing: What are the costs faced by domestic and cross-border livestock traders? When decomposed, how important is the transactions costs component compared to other physical costs of both domestic and cross-border livestock marketing? Are the returns to various participants in the livestock production and marketing chain commensurate with their functions and roles?

iv. Opportunities for improving domestic livestock marketing and intra-regional trade. What policy and institutional reforms are needed to enhance livestock marketing and intra-regional trade?

In addressing the questions, comparisons are made within and between countries to identify important similarities and differences.

1.3 Organisation of the Report

The report is in eight chapters. Chapter 1 begins with the introduction. Chapter 2 presents an overview of livestock trade in West Africa with particular focus on Burkina Faso, Mali and Niger as exporting countries and Côte d'Ivoire, Ghana and Nigeria as importing countries, using secondary data. Trends in livestock population and trade from 1970 to 2000 are examined, particularly for cattle. Chapter 3 begins with a review of models of market analysis and also describes the methods used in obtaining, organising and analysing primary data. Chapter 4 examines the operations of the various marketing channels, including the flow of livestock from the farm gate to the frontier markets and the activities of market participants. Factors influencing domestic livestock prices in Burkina Faso and Mali and the extent of seasonal price variations are presented in chapter 5. Chapter 6 assesses the costs and benefits of domestic and cross-border trade. The costs are decomposed into two broad categories - transactions costs and physical marketing costs – in order to examine the relative importance of the former in intra-regional trade in livestock. Chapter 7 discusses options for policy harmonization among the study

countries in order to improve cross-border trade, while a summary of the major findings and conclusions of the study are presented in chapter 8.

2 AN OVERVIEW OF LIVESTOCK TRADE IN WEST AFRICA

The West Africa region is rich in livestock resources. In 2000, it produced 46 million head of cattle out of which the four countries representing the central corridor of livestock trade (Burkina Faso, Mali, Ghana and Côte d'Ivoire) produced 30% of the total (Table 2.1). Including Nigeria and Niger, the six countries involved in this project produced 39 million head of cattle or 83% of the West African total. Despite the large numbers of animals there is unsatisfied demand for meat in the major importing countries; Nigeria, Côte d'Ivoire, Ghana, and Senegal.

Table 2.1: Cattle population in West Africa at 5-yearly intervals (1970-1995) and annually from 1995-2000

'000 head

COUNTRY	YEAR										
	1970	1975	1980	1985	1990	1995	1996	1997	1998	1999	2000
Benin	566	722	829	912	1,080	1,294	1,350	1,399	1,345	1,438	1,500
Burkina Faso	2,550	2,500	2,760	3,566	3,937	4,346	4,433	4,522	4,612	4,704	4,798
Cape Verde	14	10	11	10	19	19	21	21	22	22	22
Côte d'Ivoire	408	460	666	843	1,108	1,258	1,286	1,316	1,346	1,377	1,409
Gambia	249	285	293	290	327	351	353	356	359	361	364
Ghana	903	898	804	1,132	1,145	1,217	1,248	1,260	1,273	1,288	1,302
Guinea	1,300	1,489	1,500	1,300	1,472	2,202	2,246	2,291	2,337	2,368	2,679
Guinea-Bissau	230	260	290	325	410	453	464	475	487	500	512
Liberia	28	34	39	42	38	36	36	36	36	36	36
Mali	5,310	3,886	5,850	4,899	4,826	5,541	5,708	5,882	6,240	6,428	6,620
Mauritania	1,800	1,103	1,197	1,200	1,350	1,111	1,122	1,353	1,394	1,433	1,476
Niger	4,000	2,508	3,353	1,649	1,711	2,008	2,048	2,089	2,131	2,174	2,217
Nigeria	8,887	10,548	12,108	12,908	13,947	15,405	18,680	19,610	19,700	19,830	19,830
Saint Helena	0.782	0.83	1	1	1	0.673	0.673	0.692	0.692	0.692	0.692
Senegal	2,530	2,318	2,500	2,250	2,465	2,800	2,870	2,898	2,912	2,927	3,073
Sierra Leone	296	318	348	333	333	380	390	400	410	420	420
Togo	194	217	221	228	243	202	217	206	223	275	277
West Africa	29,266	27,556	32,770	31,887	34,412	38,622	42,473	44,115	44,828	45,582	46,536

Source: FAOSTAT – http://apps.fao.org accessed in September 2002.

Burkina Faso, Mali and Niger have been defined in this study as the livestock exporting countries in the central corridor of West Africa while Côte d'Ivoire, Ghana and Nigeria are major net importers. Figures 2.1 shows cattle population trends in the individual exporting countries over a 30-year period from 1970 to 2000. There were declines in cattle population due to droughts between 1970 and 1974 and 1982 to1984 and these declines were sharpest in the case of Niger, which has failed to recover to the pre-drought period of 1970.

In spite of the droughts, over the 30-year period, there has been a positive 1.8 per cent annual growth rate in cattle population in the six countries considered in this study. In the exporting countries, growth rate remained positive for Burkina Faso (1.83%) and Mali (1.48% per cent) but declined by 0.09% in Niger (Figure 2.2).

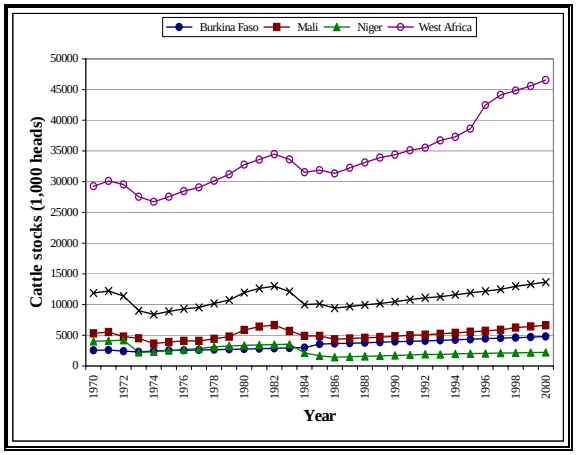

Figure 2.1: Cattle population trends in the individual exporting countries (i.e. Burkina Faso, Mali and Niger) and in West Africa, 1970-2000. (Based on FAOSTAT – http://apps.fao.org accessed in September 2002).

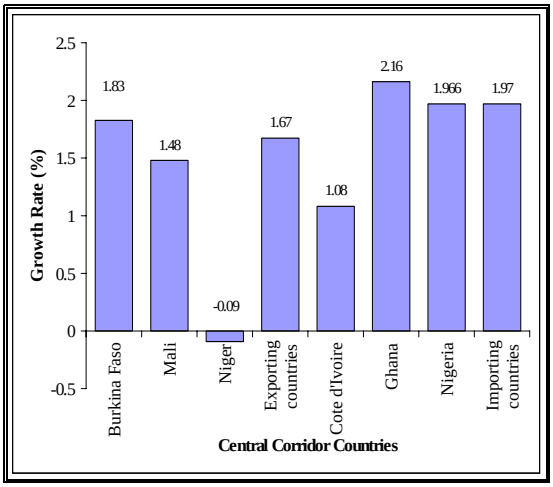

Figure 2.2: Annual growth rate (%) in cattle population in the six study countries from 1970 –2000. Source: Our calculations based on FAOSTAT – http://apps.fao.org accessed in September, 2002.

The importing countries, being coastal countries with much higher rainfall did not experience any significant adverse dryness to affect livestock production. For them, growth has been positive and more-or-less steady. Further analysis of the period after the drought of the mid-eighties indicates that cattle numbers in the entire central corridor have increased significantly, ranging from 2% in Burkina Faso to 4.3% in Ghana.

Table 2.2 shows cattle export volumes from Burkina Faso, Mali and Niger. In 1995, when the number of cattle exported (574,000) was highest; Burkina Faso, Mali and Niger exported 161,000; 222,000 and 191,000 cattle, respectively. Cattle exports declined significantly in all exporting countries thereafter and only recovered in Mali in 2000. It is likely though that there was an underestimation of cattle exports from Niger from 1996 to 2000. Nonetheless, table 2.2 highlights the fact that intra-regional livestock trade suffered serious setbacks in recent times and that concerted effort needs to be made to stimulate its recovery and put it on the path of sustainable growth.

Table 2.2: Number of cattle (1,000 head) exported from Burkina Faso, Mali and Niger, from 1990 to 2000, partitioned into periods before (1990-1993), immediately after (1994-1997) and post devaluation (1998-2000) of the CFA.

Country	Before devaluation				Immediately after devaluation				Post devaluation		
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Burkina Faso	89	92	92	102	104	161	100	100	135	132	120
Mali	185	190	204	220	170	222	229	119	108	129	279
Niger	80	110	90	70	0	191	33	21	0	22	34
Total	354	392	386	392	273	574	362	240	243	283	433

Source: FAOSTAT – http://apps.fao.org accessed in September 2002.

For the three livestock exporting countries, between 1990 and 2000, three peak cattle export years (1992, 1995 and 2000) and two low cattle export years (1994 and 1998) could be identified (Figure 2.3). During peak cattle export years, the corresponding values in US dollars were higher while during the low export years the reverse was the case. In other words, cattle price is major determinant of the volume of cattle export from Burkina Faso, Mali and Niger.

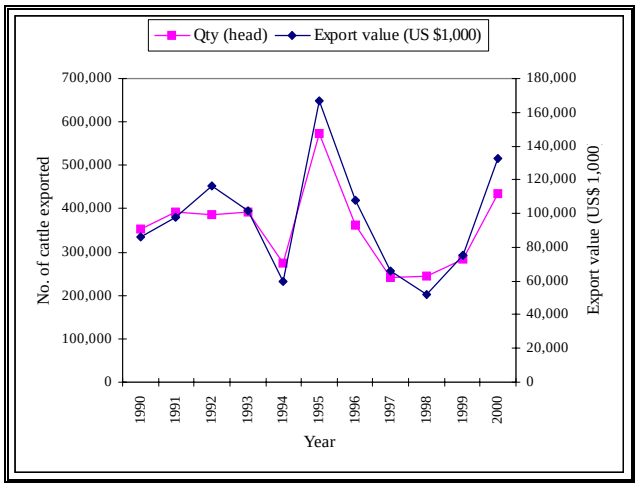

Figure 2.3: Number of cattle exported from Burkina Faso, Mali and Niger and their corresponding export values (US$ 1,000), 1990-2000.

In terms of regional imports of live animals, Table 2.3 shows that cattle imports into Ghana were negligible in the years before the devaluation of the CFA. The overvaluation of the CFA vis-à-vis the Ghanaian Cedi was mainly responsible for this. The trend changed slightly immediately after the devaluation of the CFA with Ghana importing 16,000 cattle in 1996 and up to 71,000 by 1998. Nigeria's imports seemed to have stabilised at about 330,000 cattle per year. Imports of live animals into these countries have stagnated or declined due to competition from cheap meat imports from the EU countries and increased domestic production, particularly in Côte d'Ivoire. Nonetheless, availability of cheap imports denies export markets to poor Sahelian livestock producers.

Table 2.3: Number of cattle (1,000 head) imported into Côte d'Ivoire, Ghana and Nigeria from 1990 to 2000, partitioned into periods before, immediately after and post devaluation of the CFA

Country	Before devaluation				Immediately after devaluation				Post devaluation		
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Côte d'Ivoire	93	99	106	102	140	110	131	137	154	141	146
Ghana	0	0	0	0	0	0	16	57	71	56	0
Nigeria	270	365	347	329	330	330	330	330	330	330	350
Total	364	464	453	431	470	440	477	525	555	527	496

Source: FAOSTAT – http://apps.fao.org accessed in September 2002.

In monetary terms, the value of cattle trade among West African countries increased steadily in current dollar terms from US$ 52 million in 1970 to US$ 197 million in 1995 but declined to US$ 149 million by 2000 (Table 2.4).

Table 2.4: Value of cattle trade among West African countries at 5-yearly intervals (1970 to 1995) and yearly from 1995 to 2000

(US$ 1,000)

COUNTRY	YEAR										
	1970	**1975**	**1980**	**1985**	**1990**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**
Burkina Faso	3,097	6,800	10,396	4,166	7,108	19,901	12,000	12,000	13,890	13,600	14,500
Cape Verde	39	0	0	0	0	0	0	0	0	0	0
Ghana	0	0	0	0	0	0	1	0	0	2	0
Guinea	2,600	2,800	9,000	9,000	12,000	10,000	10,000	10,000	10,000	10,000	71
Guinea-Bissau	0	3	0	0	0	0	0	0	0	0	0
Mali	19,000	21,000	80,580	52,000	55,000	75,000	75,000	41,000	38,000	47,000	98,000
Mauritania	8,600	9,200	22,000	20,000	24,000	20,000	22,220	20,000	16,000	16,000	16,000
Niger	18,000	13,000	28,483	25,000	24,000	71,749	21,104	12,600	0	14,556	20,530
Nigeria	40	0	0	0	0	0	0	0	0	0	0
Senegal	300	9	114	350	2	0	0	0	0	0	0
Togo	3	39	0	0	0	0	0	0	0	0	0
West Africa	51,679	52,851	150,573	110,516	122,110	196,650	140,325	95,600	77,890	101,158	149,101

SUMMARY

Overall, between 1970 and 1994 three major factors influenced the pattern of livestock marketing and trade in West Africa. Firstly, the severe droughts of the late 1960s and early 1970s disrupted the flow of animals from the Sahel to the coastal countries and opened up the regional markets to substantial extra-regional imports of frozen meat from Argentina and the European Union. The second factor was the inappropriate macroeconomic and sectoral policies pursued by countries in the region. These included currency overvaluation, price controls, restraints on private sector involvement in processing, and an array of tariff and non-tariff barriers that provided disincentives to intra-regional trade. Inappropriate macroeconomic policies, through their impact on income levels and distribution, also seriously affected the livestock sector. The rapid declines in incomes of importing countries caused falls in meat demand. In the two major importing countries, Côte d'Ivoire and Nigeria consumption fell from 12.2 and 8.4 kg per capita at the beginning of the 1980s to 11.0 and 4.2 kg, respectively, by the end of the decade. The third negative factor was the availability in the West African coastal markets of subsidised imports of meat and dairy products from the European Union. The price ratio between Sahelian beef and imports from the Europe rose from about 0.5 in the early 1980s to 2.0 by the end of the decade as import prices for European Union beef fell by about 29%. Consequently livestock exports from Sahelian countries to coastal countries, particularly to Côte d'Ivoire, dropped significantly and importation of frozen beef from countries outside the region, mainly from the European Union increased threefold from a low of 16% in the mid 1970s to 44% by the end of 1980.

However, beginning in the mid-1980s most countries in West Africa implemented macroeconomic stabilisation and structural adjustment programmes, including currency devaluation, abolition of marketing boards, lifting controls on livestock markets and reducing trade taxes which initially altered the structure of incentives and promoted expansion of livestock of intra-regional trade. At the same time, the sharp decline in intervention stocks enabled the European Union to reduce subsidies on beef exports to West Africa by as much as one-third. However, recent increases in meat imports indicate that the situation is dynamic and countries in the region need to establish policies that take into account changes in terms of trade and, supply and demand.

3. METHODS

3.1 Theoretical approaches to market study

The performance of a market is influenced by 2 major factors, i) the structural characteristics of the market, and ii) the competitive behaviour of actors in the market's chain. Understanding how these factors work independently and together can provide a basis for identifying opportunities to be exploited and constraints that need to be removed. Market study involving analysis of competition, efficiency and integration is useful for the formulation of interventions, particularly those aimed at (i) lowering marketing costs, (ii) reducing the tendency for excessive profit making, (iii) supporting producer prices, and (iv) stabilizing inter-seasonal price spreads.

The study of markets and marketing has remained dynamic and has witnessed a lot of paradigm shifts. Theoretical and applied models of market analysis the Structure, Conduct and Performance (S-C-P) framework (Bain, 1959); the Commodity chain or 'filière' approach (Shaffer 1968, 1973, 1980) and Transactions Costs Economics (TCE) approach (Bardhan 1980, 1984; Williamson 1985; North 1989) have been proposed. The existence of a wide range of models suggests that there is hardly any single, truly adequate theoretical framework for studying markets, particularly in developing countries. In effect, in studying livestock markets in West Africa, there is a need to adopt useful elements of the old and the new to understand structural and institutional factors constraining and/or promoting livestock marketing. In the following sub-sections, we shall examine briefly the major elements of the some of the approaches mentioned above and show how we have applied them in this study.

3.1.1 The Structure, Conduct and Performance (SCP) approach

The structural components of a market include marketing channels, marketed volumes, degree of market concentration and existence or otherwise of market entry barriers. Market conduct refers to the various strategies adopted by participants in buying, selling, and pricing. The SCP approach postulates that as market structure deviates from the paradigm of perfect competition, the degree of competitive conduct will decline and there will be a consequent decrease in output and allocative efficiency, and an increase in prices. This implies that the performance of markets can be assessed based on the level of competition and efficiency in those markets. Structure and conduct can be measured directly while performance is generally assessed indirectly. The quality of results from the direct measurement of the structure and conduct of a market could be enhanced when, for example, as in this study marketing channels have been distinguished spatially and the traders operating within them have been stratified according to the scale of their operation and their roles and functions in the marketing chain. Recognising economic and social differences limit generalisation and speculations about trader behaviour and market structure and can lead to a better understanding of how markets function. For instance, participants in livestock trade in West Africa, and most of SSA, operate at different scales. At one end, there are small itinerant traders – usually keen to maintain close social relationships with smallholder livestock producers in their domain of operation – involved in farm and village level collection, while at the other end there are big private

entrepreneurs who regroup and export animals. The existence of these strata implies that a certain degree of price collusion could go on within and between strata that, in turn, may affect market entry conditions and result in changes in market structure. Little (1992) in Somalia found that there was less competition among the big livestock traders due to high market concentration, but the reverse was the case for small traders. At times of adversity, e.g. drought or economic downturn, the smaller traders are better able to exploit their investment in social capital to survive economically.
The SCP framework has been criticised as being too abstract and deterministic. Some of the criticisms are that its price integration and price performance analyses are static and suffer from spatial arbitrariness or are entirely excluded (Harriss-White, 1999); its market segmentation concepts with respect to margins and transfer costs are faulty (Barrett, 1995); and it does not explain how competition among traders may affect consumer welfare. As a result, the approach fails to explain the causal links between structure, conduct and performance and is, therefore, unable to predict (real) performance from (real) structures and vice versa (Harriss-White, 1999). Once these limitations are recognised, the SCP framework still remains the conventional approach for studying market institutions (Magrath, 1992, Scaborough and Kydd, 1992; Scott, 1995). In this study, it provides the building blocks for examining whether marketing margins charged by various actors in the marketing system are consistent with costs and whether the degree of market concentration is low enough (i.e. the number of operators in the markets are high enough) to ensure competition and drive down costs as much as possible.

3.1.2 Commodity chain or Filiere approach

The commodity chain approach builds on the SCP framework. It assumes vertical as well as horizontal relationships between firms in evaluating market performance and is more dynamic in following the entire commodity flow from input supplier to the ultimate consumer. At each stage along the commodity chain, the approach permits 3 types of analysis namely (i) costs and margins, (ii) spatial flows (involving places, volumes and directions), and iii) the social relations of trade including the identification of key points of asset concentration (Leplaideur, 1992).

Furthermore, the economic, infrastructural and institutional environments in which markets are operating are not taken as given, but are studied in terms of (i) their impacts on market performance, and (ii) the constraints and opportunities they offer for markets to contribute to improved economic performance. These constraints and opportunities can be identified through interviews of participants in the commodity chain and government policy makers concerning their subjective evaluations. When the results of these interviews are combined with classical tools for market analysis such as the costs and margins, and spatial flows mentioned above as well as analysis of underlying trends in supply and demand (including their predicted impact on output and product use), then the managerial, institutional, technological and policy constraints to the marketing of the commodity are elucidated.

The Filiere approach has been criticised on account of the difficulty usually encountered in defining empirical boundaries of segments in the commodity chain and in distinguishing between exogenous and endogenous factors affecting market exchange.

The approach is constrained in scope to individual crops/outputs, but the structure and functioning of commodity chains may vary greatly within a region and between crops. In the context of farming systems in West Africa where varying mixes of crop and livestock enterprises exist, the variation in structure and functioning of commodity chains can be enormous.

In spite of these shortcomings, the commodity chain approach is flexible and is particularly applicable to the study of markets in developing countries. In using this approach, it is important to (i) define a set of activities, which have sufficiently strong links to be described as a system or sub-system and (ii) to identify systems or sub-systems which are relevant for policy purposes (Williams, 1999).

3.1.3 Transactions Costs approach

One of the assumptions for perfect competition[1] in neoclassical economic theory is perfect information under which it is presumed that traders in each market have perfect knowledge of the situations in all other markets and, as such, inter-market price differentials only reflect transportation and handling costs between concerned markets. Transactions cost economics (TCE), unlike neoclassical economic theory, recognises that commercial activity does not occur in a frictionless economic environment (Williamson, 1986). Costs usually incurred include cost of purchase of product and transactions costs, which can be further subdivided into information (*ex-ante*), negotiation, and monitoring or enforcement (*ex post*) costs (Williamson, 1986). According to Staal *et al*., 1997, transactions costs include, *inter alia*, the costs of searching for a partner with whom to exchange, screening potential trading partners to ascertain their trustworthiness, bargaining with potential trading partners (and, in some cases, officials who can hold up trade) to reach an agreement, transferring the product (typically involving transportation, processing, packaging and security title if necessary), monitoring the agreement to see if conditions are fulfilled, and enforcing (or seeking damages for violation of) the exchange agreement.

In addressing the limitation of the filiere approach regarding institutions, transactions costs economists argue that institutions are efficient responses to transactions costs and postulate that institutions emerge due to high assets specificity, high uncertainty, high levels of transactional idiosyncrasy and high levels of opportunism. The theory predicts that transactions costs increase with distance, market concentration, systemic complexity and declining clarity of property rights and that transactions costs decline with relational contracts, with the standardisation of quality and quantity (Marion, 1986).

[1] In economic theory, a market is assumed to be perfectly competitive if (a) there is perfect information and traders in each market have perfect knowledge of the situation in all other markets, (b) there are many buyers and sellers in the market and therefore no single buyer or seller can influence prices, (c) the product is homogenous and buyers regard it equally irrespective of its supply channel, (d) there are no dominant market participants powerful enough to pressurise competitors or engage in unethical marketing practices, (e) there are no entry barriers to the market for both buyers and sellers, (f) there are no artificial restrictions to the movement of resources, and (g) there is no conspiracy among participants to influence prices and alter other marketing decisions.

Transactions costs become prohibitive when they are so high as to exceed the expected gains from the activity, in which case no transaction takes place. Prohibitive transaction costs could lead to low percentage commercialisation of domestic production for an activity involving a significant number of producers and which can be imported (Staal *et al*., 1997). This describes the situation in West Africa where livestock production is still in the hands of large number of smallholders who appear to be losing ground to meat imports from outside the region, particularly from the EU. Lowering transactions costs would increase traded volumes with economic benefits to both traders and producers. Increased volume of livestock trade will promote regional trade and integration.

In many studies, imperfections in marketing systems, which lead to loss of competitiveness and efficiency, have been attributed to high and sometimes prohibitive transactions costs. Even then, there are only a few studies in which detailed empirical evidence is provided on the magnitude and importance of transactions costs (Hobbs, 1997; Goetz, 1992, Staal *et al*., 1997). Staal *et al*. (1997) observed that this may be due to the existence of conceptual and measurement difficulties when transactions costs are high enough to prevent exchange from occurring or due to the differences in the nature of observed transactions costs. For example, a farmer's decision to sell at the farm gate rather than at a more distant market may be influenced by the desire to avoid transactions costs involved in the latter option. On the other hand, the same farmer may decide to go all the way to a distant market because of excessive profits made by intermediary traders – a situation, which lowers return to producers. This study used simultaneous surveys of livestock traders and policy makers over a period of more than one year to collect transactions data.

Although it is desirable that observed marketing margins are consistent with costs, getting a product such as an animal from its producer (a smallholder) to its final consumer requires many more individual transactions partly because of a large number of intermediaries and partly due to the size of each sale which is smaller compared with what obtains in developed economies (Fafchamps, 1997). This phenomenon increases transactions costs and, consequently, reduces marketing margins but it does not necessarily imply that markets in which this takes place are not performing efficiently. In effect, the assessment of market performance should be based on a wide range of considerations in addition to the consistency between costs and marketing margins – this is often viewed as a static assessment. Furthermore, factors affecting price formation and other longer run dynamic issues must be incorporated to see how market forces and policy interventions can create incentives to encourage investment in the marketing system to drive agricultural transformation and productivity growth.

3.2 Location and market operations in the three frontier markets

Three frontier markets located at **Sikasso**, **Niangoloko** and **Bittou** were selected as the main sites of investigation and sources of information (Figure 3.1). The **Sikasso** market in Southern Mali is a daily livestock market located about 100 km from the border with Côte d'Ivoire. Animals traded in this market are mainly for local slaughter while the bulk of animals meant for export are purchased in villages within the region or in upstream markets and trekked to Sikasso, loaded into trucks and exported to Côte d'Ivoire. This

market had no facility for weighing animals at the time of the market surveys. The livestock market in **Niangoloko** at the border between Burkina Faso and Côte d'Ivoire operates on Saturdays only, although animals may be brought to the market for resale or for export any day of the week. Transactions taking place in the market account for only a small fraction of the cattle passing through the market. Traders buy the bulk of their animals from surrounding villages, but they are obliged to transit through this frontier market before exporting animals, according to the regulations of the local market association. Niangoloko market had weighing scales that worked throughout the survey period except during a 3-week period in August 2000.

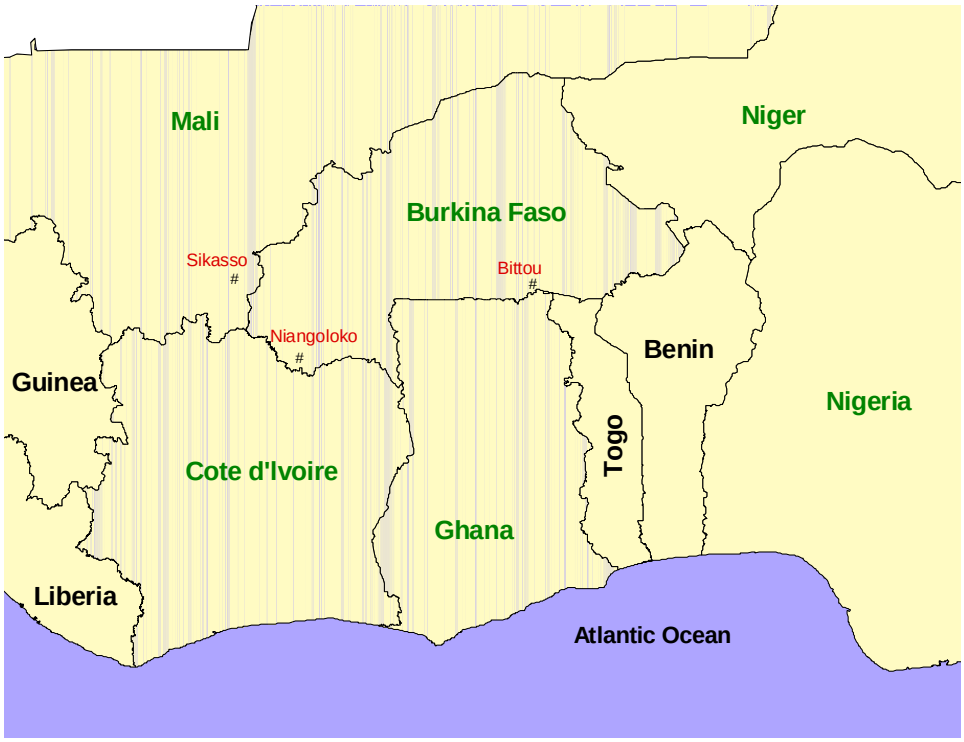

Figure 3.1: **Map showing countries in the central corridor of West Africa and locations of the frontier livestock markets in Sikasso (Mali) and Niangoloko and Bittou (Burkina Faso).**

Bittou livestock market in the eastern region of Burkina Faso is located at the border between Burkina Faso, Ghana and Togo and is open every third day. As a rule, the market for small ruminants takes place in the morning and that for cattle in the afternoon. Bittou had its weighing facilities at a distance from the main market and this required the movement of animals from the central part of the market through a poorly maintained corridor, which becomes impassable during the rainy season. As a result, weighing animals was generally more difficult in Bittou than in Niangoloko.

3.3 Data collection

Preliminary data collection to establish sampling frames, profiles of market participants (i.e. sellers, buyers and middlemen) and major features of each market started in June 1999, but regular market surveys on a weekly basis commenced in December 1999 and

ended in June 2001. In addition to market (transaction) surveys, traders were also surveyed as well as policy makers purposively selected from relevant government ministries (e.g. Animal Resources, Trade, Finance, Transport and Immigration) in each participating country. These government officials were interviewed to determine changes and new directions in government policies, statutory laws and institutional support to livestock marketing and trade. Data from secondary sources (e.g. government publications and national statistical annual yearbooks) were also collected.

3.3.1 Market transactions surveys

Market data collected include information on flow of animals to the 3 frontier markets, including geographic origin, number, type and prices of animals traded, modes and costs of transportation, arbitrage functions performed by different marketing agents, access to credit etc. For livestock transactions in particular, data were collected on number of animals present on a market day, number of animals sold, price at the point of origin, price at market of interview, weight (directly from weigh scales or indirectly through girth measurements, particularly in Sikasso), sex, age, condition, breed, colour, purpose of purchase (e.g. resale, slaughter, fattening), type of seller (e.g. farmer, trader, breeder) and type of buyer (farmer, trader, restauranteur, butcher). Three questionnaires, one each for cattle, sheep and goats transactions were used (Volume II[2], Appendices 1, 2 and 3). The initial intention was to record all transactions in the markets but this was not possible for a number of reasons;

i. Animals bought or sold on non-designated market days were not recorded;

ii. On some market days, large numbers of animals were brought to the market for sale and it was impossible to record every transaction;

iii. Some traders in Bittou (mainly Ghanaians) deliberately leave the market grounds after their transactions and refused to be interviewed.

In spite of these obstacles, a large proportion of all transactions (sometimes all) on a particular day was recorded. In all, 19001 transactions involving 11419 cattle, 3612 sheep and 3970 goats were recorded in the three frontier markets with specific breakdowns as follows: Sikasso (7404 cattle), Niangoloko (2230 cattle) and Bittou (1785 cattle, 3612 sheep, 3970 goats).

3.3.2. Trader surveys

In addition to market surveys described in the preceding section, periodic surveys were conducted at peak and off-peak seasons of cross border trade in each frontier market to collect information on volume, costs, taxes, levies, credit, interest rates, transport regulations and enterprise development policies constraining or promoting cross border livestock trade. Traders' surveys consisted of interviews with both export and domestic

[2] A total of 13 questionnaires were used in the process of conducting the market and trader surveys. Some of them are bulky. As a result, all the questionnaires have been preserved for reference in a different volume.

traders operating in the markets. To capture seasonal variations, two series of interviews were carried out during different periods of the year - the first was between July and November 2000 while the second spanned March 2001 to June 2001. Nine different questionnaires were used for the interview series (Volume II, Appendices 4 – 12). In the first phase, the same questionnaire was used for all traders regardless of whether they were operating externally or internally. However, they were separated into these two categories for the second series of interviews.

The questionnaire used in the first series of interviews consisted of three parts. The first part addressed general information such as trading history, trading practices and activities other than trading. The second part dealt with the purchase of cattle and transportation to the frontier market, while the third section was focused on issues related to exportation and resale of livestock. The questionnaires used in the second series of interviews followed more or less the same structure as the one used for the first interviews. However, based on experience from the first, some of the questions were modified and some new ones added to capture the differences between domestic, cross-border (i.e. export-oriented) as well as non-resident (i.e. external or coming from neighbouring countries) livestock traders operating in each market.

The first series of interviews revealed that during a certain period of the year some traders fattened cattle and sheep for resale. A separate questionnaire was subsequently designed to collect information on this activity (Volume II, Appendices 13 & 14).

The design of the trader surveys was similar for the 3 sites, however, some site-specific peculiarities emerged during implementation. For example, while final group interviews were held in Niangoloko and Bittou to clarify some unanswered questions, all attempts to convene similar group interviews in Sikasso failed, probably as a result of survey fatigue on the part of the traders. Other peculiarities, especially in relation to sampling of the traders are as follows:

In **Sikasso**, a list of members of COBAS (Cooperative de commerce de bétail de Sikasso) was used as the sampling frame. The listed traders were classified by trade volume and type of trade (domestic or external) with the help of two key informants. A stratified random sample, consisting of 30 export traders (10 large, 10 medium and 10 small) and 20 domestic traders was drawn for the interview. It later became clear that there were many more traders operating in the market who were not members of COBAS. As a result, the sample was extended to accommodate this new group. Also, when previously selected members of COBAS showed reluctance to continue with the interviews they were substituted with traders drawn from outside COBAS.

In **Niangoloko**, a sample of traders was initially selected from a list of members of the local livestock traders association. The actual number of traders operating in the market turned out to be much smaller than the list suggested and did not exceed 40. As a result, there was no need for further sampling. A total enumeration of consenting participants yielded 33 (32 export and 1 domestic) traders.

As was the case for Niagoloko, the number of traders in **Bittou** was also modest necessitating no further sampling. The difference, however, was that many non-resident traders operated in Bittou. The bulk of small ruminant exports and a significant part of the cattle export from Bittou were done by Ghanaian traders from Bawku – a Ghanaian town near the border with Burkina Faso. As noted earlier, Ghanaian traders were rather discrete about their business transactions, so only a handful of them consented to be interviewed and this limited the information available on small ruminant export trade.

3.4 Analytical methods

The market and traders' surveys as well as the secondary data that were collected provided information on livestock prices; their biological characteristics such as age, weight, sex, body condition rating, colour, breed; origins and destination; mode of transportation, handling costs, official and illicit taxes, marketing channels and participants in the marketing chain (types of buyers and sellers), etc. To achieve the stated objectives of this project, this data was used to provide a better understanding of livestock marketing operations, determinants of domestic livestock prices, and costs and returns to domestic and cross-border trade in livestock.

Analysis of data on livestock marketing operations involving marketing channels, market participants and volumes and composition of flows of livestock in the channels was based on flow diagrams and charts and descriptive statistics.

A hedonic price model was used to examine factors affecting livestock price formation while price variations due to space and time were examined using means, coefficients of variation and charts.

To investigate the spatial integration of livestock markets, bivariate correlation of prices between pairs of origins (i.e. sources) of traded animals was done to determine the extent to which prices moved together. In addition, Geographic Information Systems (GIS) tools (DCW, 1995 and Arcview 3.2®) were applied to map the spatial distribution and proportion of contribution of the important collection markets to traded cattle. This was followed by a road network analysis to examine the extent to which travel time between buying and reselling points influenced participants' choice of collection markets.

Partial trading budgets for domestic marketing and cross-border trade in cattle were developed and used to estimate costs and returns to marketing operations. Marketing costs were subsequently decomposed into physical marketing and transactions costs components to determine the magnitude of transactions costs relative to other marketing costs.

Since various methods were used to in this study, the rationale behind the use of each method and a description of how it was applied is presented in the chapter where such a method is utilized so as to make it easier to relate methods of analysis closely to results and discussions of each topic.

3.5 Data limitations

Due to lack of a functional weigh-bridge in Sikasso, the weight of cattle traded or passing through the frontier market could not be obtained directly. Instead, cattle were measured for girth of the thorax (cm), body length (cm) and height at shoulder point (cm). Next, when measured live animals were slaughtered at the local abattoir next to the market, their carcasses were weighed using the scale in the abattoir. These carcass weights were regressed against body measurements to derive parameters for estimating the liveweight of cattle exported through Sikasso. Subsequently, the weight estimates were used to obtain price per kg liveweight used to compare Sikasso prices with those of Bittou and Niangoloko. Although the cattle weights estimated for Sikasso compared well against those obtained directly from Bittou and Niangoloko, the accuracy of results based on these estimates depends on goodness of fit of the regressions models used. Therefore, such results need to be interpreted with caution.

Secondly, there was a lack of consistent pairs of prices for points of origin and frontier market for all recorded transactions. Where it was possible to use primary and secondary information on transportation and handling charges, fees to market associations and brokers, communal purchase taxes, etc. to obtain a missing part of the pair, this was done or otherwise the data was considered unusable for determining inter-market price variations. This considerably limited the number of cases that could be analyzed to the extent that only the Bittou market data was used to examine market integration.

4 LIVESTOCK MARKETING OPERATIONS: CHANNELS, TRADERS' CHARACTERISTICS AND LIVESTOCK FLOWS

The livestock marketing chain in West Africa is fairly well known but economic and institutional barriers faced by operators in the marketing channel have often been underrated at considerable cost to the development of intra-regional trade in livestock and the livestock sector as a whole. This chapter presents the results of an assessment of the livestock marketing channels, the behaviour of market participants, existing market institutions and volume of trade flows of livestock in the various channels supplying Sikasso, Bittou and Niangoloko frontier livestock markets and the terminal markets in Côte d'Ivoire and Ghana.

4.1 Marketing channels

Trade in live animals in the central corridor of West Africa generally starts with the collection of animals from farm gates and village markets (i.e. **primary** or **collection** markets), moving on to **secondary** or **regrouping** markets (at frontiers or other markets in fairly big towns) where animals are sorted into different classes based on condition, sex and age and then on to **terminal markets** in the capital cities of the respective countries and/or in the case of the Sahelian exporting countries to the coastal countries such as Côte d'Ivoire, Ghana and Nigeria (Figure 4.1). The figure shows that the farm gate and surrounding villages are at the apex of the channel. At the farm gate, pastoralists and smallholder crop-livestock farmers have three options in selling their animals namely; sell i) to itinerant livestock traders, ii) in collection markets, and iii) directly at the frontier markets. The flow of animals to the collection and frontier markets is not strictly in one

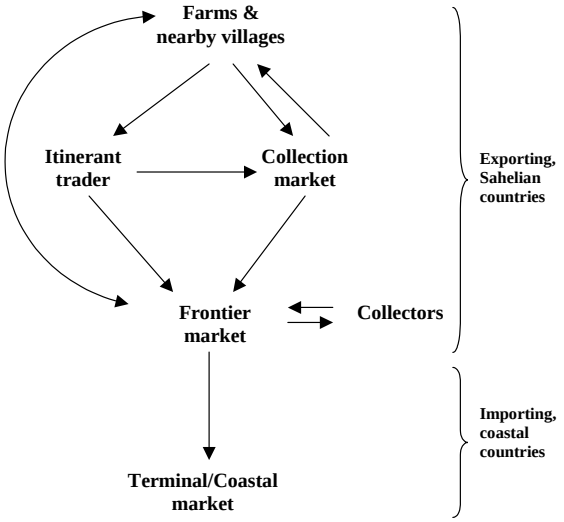

Figure 4.1: Channels of cross-border livestock marketing in the central corridor of West Africa

direction as farmers also buy animals for breeding, fattening and traction from these markets.

Whatever the option utilized, all export animals in the study countries end up passing through the frontier markets for regrouping and sorting into different grades. Animals

purchased directly from the farm gate or collection markets by export traders do not change hands again at the frontier market. As such, the frontier market plays the dual role of providing a point for regrouping animals already purchased upstream as well as a place where buying and selling of animals occur. At the frontier markets, collectors still buy animals with the sole aim of reselling them in the same market and making a profit. Domestic livestock marketing ends at the frontier market. Cross-border trade, for the case studies examined in this report, starts here and involves exporting animals from the frontier markets to terminal in the coastal countries including, Côte d'Ivoire, Ghana and Nigeria.

4.1.1 The role of livestock collection markets

In both the trader and the market surveys, information was collected on the origin of animals sold. In the Sikasso case, 186 points of origin were identified during the survey period. These represent locations where traders bought the cattle that were brought to the frontier market for resale or exportation. Slightly more than half of the 186 points of origin of animals were located on maps and such places were grouped into 15 collection zones based on proximity to each other and to the frontier market. Most of the zones lie more or less concentrically within a 100-km radius of Sikasso. Just outside this 100-km radius, there were 3 zones namely: Koumantou, Beleko and Koutiala located to the west, north and north-west of Sikasso respectively. Mopti was one of the 2 other more distant zones covering locations in the Niger Delta region in the north-east of Mali (Figure 4.2).

With respect to collection of animals, the more distant zones play only a minor role. An estimated 98% of the cattle sold in the Sikasso market, and 62% of the transit animals came from the following 4 zones:

- Sikasso (the area within a 20-km radius of Sikasso);
- Niéna (a town to the west of Sikasso);
- Danderesso (comprising villages in the area north-east of Sikasso up to the frontier with Burkina Faso, with the main village being Danderesso); and
- Burkina Faso (comprising villages in Burkina Faso, just east of the Danderesso collection zone).

Animals that arrived from the Niéna zone were almost entirely bought from the Niéna cattle market, while those from the 3 other zones were purchased mainly from their surrounding villages.

Figures 4.3 and 4.4 show the relative importance of the various zones in contributing to total number of animals sold in the Sikasso frontier market and those in transit through the market. It should be noted that the data on cattle sold in the market cover transactions made on Wednesdays, the day market surveys were usually conducted in Sikasso. Niéna is an important upstream market for animals resold in Sikasso[3]. Animals resold in Sikasso

[3] The Niéna Market is open every Sunday. After trekking the animals for 2 or 3 days from Niéna, they reach Sikasso and are presented for sale on Wednesday.

also originate from Sikasso zone itself and to a lesser extent from the two zones to the north-east of Sikasso, i.e. Danderesso and Burkina Faso.

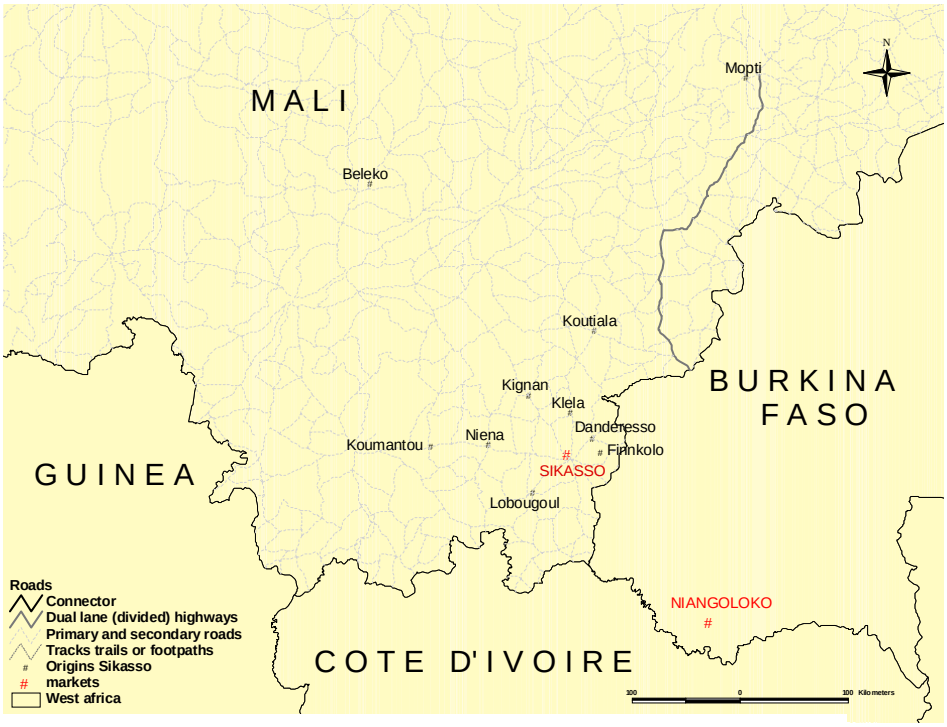

Figure 4.2: Map showing collection zones and villages of origin of cattle traded or transiting through Sikasso frontier livestock market,

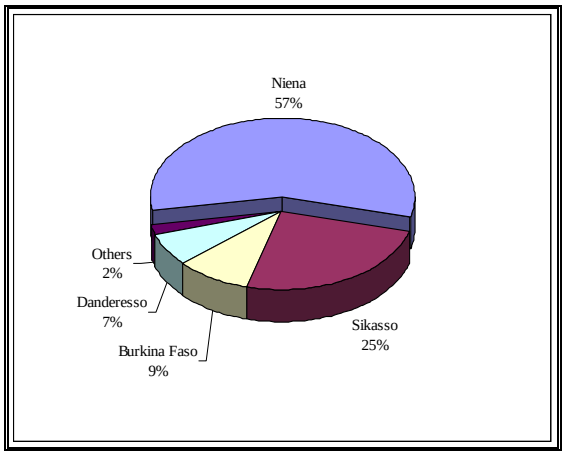

Figure 4.3: Origin of cattle traded on Wednesdays in Sikasso during the survey period.

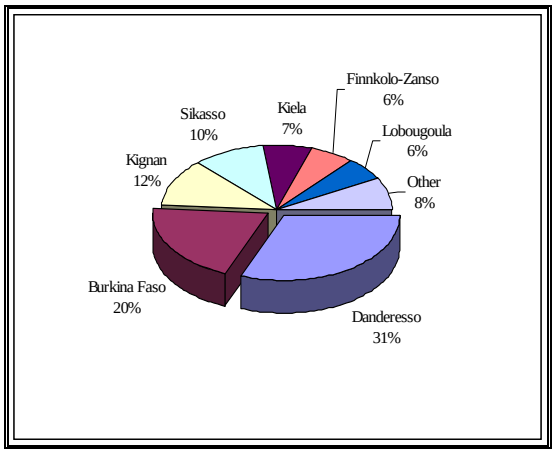

Figure 4.4: Origin of cattle in transit through the Sikasso frontier market to Côte d'Ivoire.

In the case of animals purchased elsewhere and only transiting through the Sikasso frontier market, the most important collection zones are Danderesso and Burkina Faso which together account for about half of the animals. Other important zones are Kignan and Sikasso (not including the frontier market) followed closely by 3 outlying zones namely: Kiéla , Finnkolo-Zanso, and Lobougoula (see Figure 4.2 for their locations on the map). With the exception of Burkina Faso, these zones all lie within a 60-km radius of

Sikasso. As mentioned earlier, the bulk of these animals are bought at the farm gate. Except for Sikasso zone and Danderesso village where a significant number of animals were purchased through trader-to-trader interactions, the prevalent mode for collecting animals was through farmer-trader transactions.

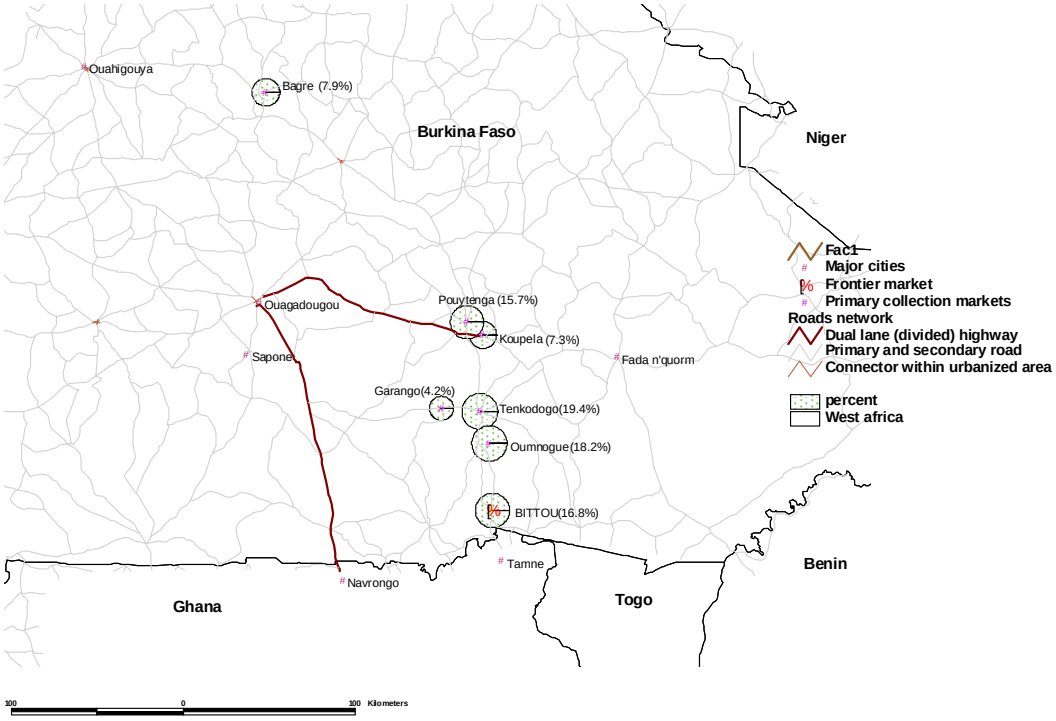

Figure 4.5: Map showing sources and percentage supply of cattle to the Bittou frontier livestock market, January 2000 to June 2001.

Similarly, the collection zones and villages of origin played important roles in the case of Bittou and Niangoloko frontier markets. In Bittou, traders mentioned 23 villages where they collected animals and the contributions of these villages to the total 1785 cattle traded in Bittou during the survey period ranged from 0.1% contributed by Gouni Peul to 19.4% by Tenkodogo. In addition, Bagre, Bittou (i.e. surrounding villagess, excluding the frontier market itself), Gnangdin, Koupela, Pouytenga, and Oumnogue (also called Woumnohin) were important sources of cattle supply to the Bittou frontier livestock market. Figure 4.6 shows the location of these sources as well as their percentage contribution to the total number of transactions recorded in Bittou market. Apart from Bagre which is relatively distant from Bittou, the other important sources were within 100 km of the market and trekking was the most important means of transporting animals from source to the frontier market.

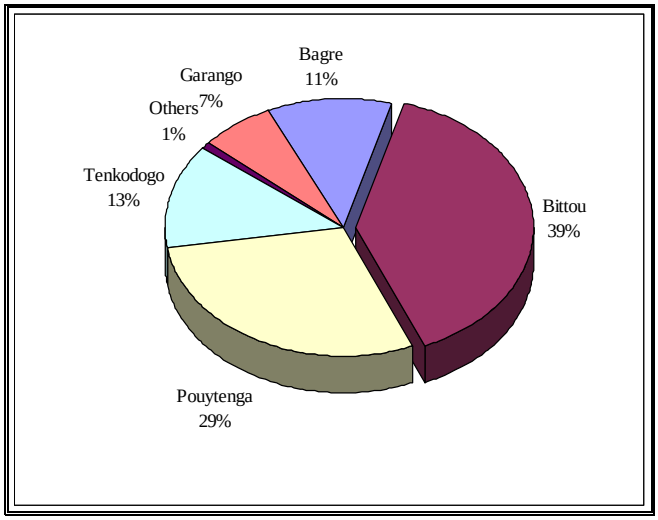

Figure 4.6: Contribution of collection zones to recorded sheep and goats transactions at Bittou (Burkina Faso) livestock frontier market, January 2000 – June 2001.

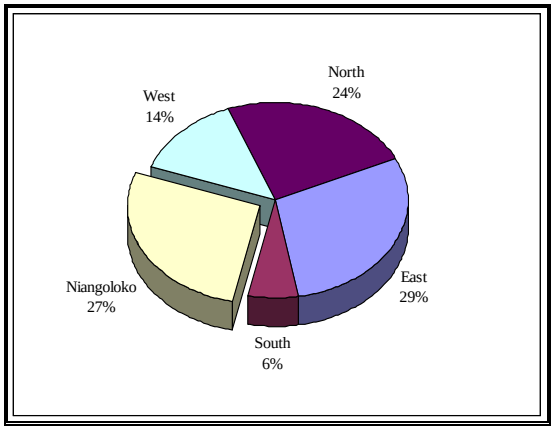

Figure 4.7: Percentage contribution of various collection zones to recorded cattle transactions at Niangoloko livestock frontier market, January 2000 – June 2001.

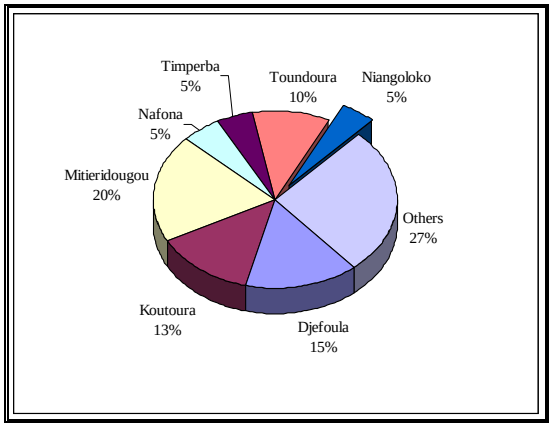

Figure 4.8: Important villages of origin of cattle traded or transiting through the Niangoloko livestock frontier market, January 2000 – June 2001.

As mentioned earlier, transactions for cattle and for sheep and goats were recorded in the case of Bittou market. Cattle, sheep and goats are reared together traditionally, so the sources of sheep and goats are almost the same as those for cattle although in slightly different order of importance, with Gnangdin and Koupela which were important for cattle dropping out for Garango which produced 7% of the traded sheep and goats. Sheep and goats bought from surrounding villages and Pouytenga accounted for almost 70% of the 7582 recorded transactions, while Tenkodogo and Bagre contributed 13% and 11% respectively (Figure 4.6).

Similar to the cases of Sikasso and Bittou, Niangoloko and its surrounding villages, i.e. Niangoloko collection zone produced 27% of the 2230 cattle transactions recorded at its frontier market (Figure 4.7). In terms of the contribution of individual collection markets, Niangoloko (not the frontier market itself) accounted for about 5% only (Figure 4.8).

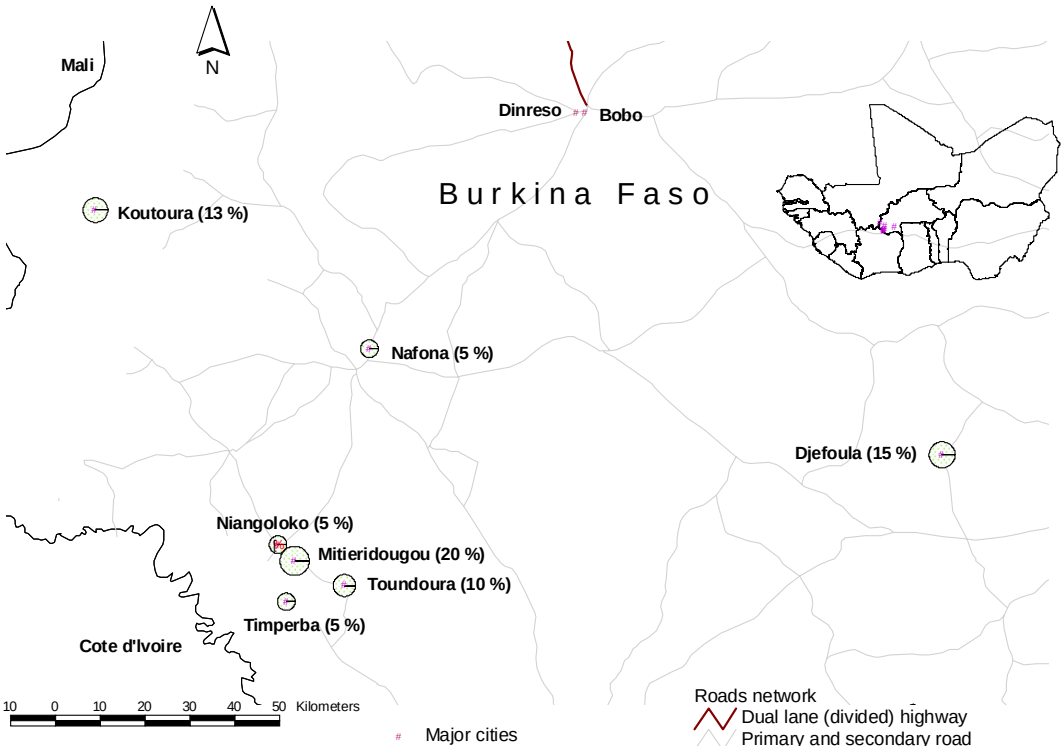

Figure 4.9: Map showing Niangoloko frontier livestock market and important villages of origin of cattle, sheep and goats, January 2000 – June 2001.

Mitieridougou, about 10 km south-east of Niangoloko supplied the highest proportion (20%) of all recorded transactions for the Niangoloko market (Figure 4.9). In fact, the area within 30 km radius south/south-east of Niangoloko accounted for more than 35% of the supplies, bt sizeable number of cattle arrived from as far afield as Koutoura (13%) and Djefoula (15%).

4.2 Profile of livestock traders operating in frontier markets

In this section, the results of the traders' surveys covering demographic characteristics, trading history, modes of buying and selling and relationships with brokers and other agents, volume of business, capital requirements, access to credit and factors constraining livestock trade are presented.

Private entrepreneurs ranging from small itinerant traders to large-scale export traders operate the livestock marketing channels described above. Other major participants are livestock producers, traders' agents and brokers (intermediaries). The major role of livestock producers is as suppliers/sellers, although they occasionally purchase animals for breeding, fattening and animal traction. Brokers (intermediaries) are seen as part of the market actors and their roles are described below. Butchers featured at every point along the marketing channel but since this study is focusing on activities leading ultimately to cross-border livestock trade, their participation is not given any further attention. Traders, as the major market actors, are focussed upon in this section.

Table 4.1: Number of traders interviewed in Sikasso, Niangoloko and Bittou

Market	Type of trader	Total no. interviewed	No. interviewed twice	No. interviewed in the 1st series only	No. interviewed in the 2nd series only
Sikasso	Export traders	**29**	15	13	1
	Domestic traders	**18**	8	10	
Niangoloko	Export traders	**32**	17	14	1
	Domestic traders	**1**	1		
Bittou (cattle)	Export traders	**19 (+ 3 Ghanaians)**	12	6 (+ 3 Ghanaians)	1
	Domestic traders	**20**	13	1	6
Bittou (small ruminants)	Export traders	**3 (+ 4 Ghanaians)**	1	2 (+ 4 Ghanaians)	
	Domestic traders	**17**	12	3	2
Total		**146**	**79**	**56**	**11**

During the traders' surveys, 146 traders were interviewed, 79 of them in both the first and second interview series, 56 in the first series only and 11 in the second series only, making a total of 225 interviews. A summary of the number of traders interviewed per site and number of interviews conducted per trader is presented in Table 4.1. It is noteworthy that although Ghanaian traders constituted a majority of the export traders in Bittou for both cattle and small ruminant trade, due to their tendency to conduct their businesses discretely, only 7 out 29 export traders who consented to the interviews were Ghanaians.

4.2.1 Socioeconomic characteristics of livestock traders

Domestic and cross-border trade in livestock is carried out by male traders from the various tribes that inhabit the study countries (e.g. Fulani, Bambara, Bissa, Dioulla, Senoufo, Maraka, More, Mossi, Senari, Sonrai), with the Fulani tribe making up 52%, 60% and 62% of the sampled traders in Sikasso, Niangoloko and Bittou frontier markets, respectively. Other tribes with prominent participation were the Senoufo (constituting 26% of the traders in Sikasso), More (38% in Niangoloko) and Bissa (23% in Bittou). About one-third of these traders also engaged in agriculture, as a secondary occupation.

Table 4.2: Characteristics of livestock traders operating the marketing channel in the central corridor of West Africa.

CHARACTERISTIC	PERCENTAGE PER LOCATION			
	Sikasso (n = 46)	Bittou (n = 32)	Niangoloko (n = 31)	Average
Educational level attained				
No school	46	38	15	33
Islamic education	45	40	59	48
Primary	9	5	16	10
Secondary	0	17	6	8
Experience in livestock trade (years)				
1 – 3 years	2	9	13	8
4 – 6 years	3	16	44	21
7 – 9 years	17	9	19	15
> 10 years	78	66	24	56
Original part played in market before now				
Trader	89	81	96	89
Agent in another market	0	13	0	4
Broker in this market	11	6	4	7
Source of initial funds				
Own	96	97	97	97
Borrowed	2	0	0	1
Own + borrowed	2	3	3	3
Source of funds now				
Own	95	75	87	86
Borrowed	0	0	0	0
Own + borrowed	5	25	13	14
Partnership status at the beginning				
Alone	80	91	84	85
In partnership	20	7	16	14
Partnership status now				
Alone	87	94	100	94
In partnership	13	6	0	6

Table 4.2 shows that on average 33% of the traders were illiterate with this figure ranging from 15% in Niangoloko to 46% in Sikasso. The Islamic religion background of the majority of the traders is reflected in the fact that 40% to 59% of them had Islamic education. The most educated traders were found around Bittou where up to 17% completed secondary education. Education did not seem to play a key role in determining level of participation or success as livestock traders.

4.2.2 Livestock trading history

More than one-half of the traders have been operating more than 10 years. In the Sikasso market, about 78% of the traders had more than 10 years experience in the business, while the reverse was the case for Niangoloko where about 57% had experience of 6 years or less. Livestock trading involves a lot capital and as a result some of the traders had to initially act as agents for others (assisting them in buying and transferring livestock from other markets), as brokers in the same market (building up financial capital and

social capital in the form of trust) or entering into partnerships with others in order to participate in the trade. Table 4.2 indicates that 4-11% of the current traders in Sikasso, Bittou and Niangoloko markets initially acted as brokers in those markets while for Bittou, 13% were agents for other traders. It could be surmised that successful participation in livestock trade requires not just the capital but also a period of apprenticeship that could last for many years. Although intending entrants into the livestock trade may have the required start-up capital, they would still face obstacles posed by lack of objective standards in pricing animals and a highly personalised mode of transacting business, which depends on reputation and experience built over time, hence the need for apprenticeship.

4.2.3 Funding livestock trade

At the farm-gate/village level, payment for all purchases was usually made in full and in cash at the time of purchase. At times, traders give credit to farmers/pastoralists to lock them into a contract to ensure a steady source of supply. The credit is paid back when the farmers/pastoralists supply animals to the traders. Down the marketing channel, a combination of cash payment and credit is the pattern for paying for animals. Survey results showed that at the frontier market about 24% of the transactions were on credit while 56% were a combination of varying levels of cash payment and credit. The amount of capital required to meet direct cash purchases is often enormous and limiting for many traders.

During the interviews, traders were asked to group themselves in terms of volume of trade and capital required to operate successfully within the identified groups. Three groups emerged from the exercise namely; small-, medium- and big-scale traders roughly coinciding with itinerant traders (small), collectors (medium) and export traders (large-scale). Itinerant traders are usually small traders maintaining close relationship and with a similar socio-cultural background to livestock producers. They use the social capital built up over the years to enter into special buying arrangements with producers (e.g. buying on credit). Collectors have weaker ties with livestock producers compared to itinerant traders and mostly operate the livestock marketing channels between the collection and frontier markets. Finally, at the top of the ladder are export traders.

The results of the traders' own grouping exercise are summarised in Table 4.3 which shows that to start livestock trade small-scale traders needed an average of 460,000 CFA franc in Sikasso to 1.5 million CFA franc in Niangoloko and large-scale traders from 2.6 million CFA franc in Bittou to 7.7 million CFA franc in Niangoloko. Monetary outlays for medium-scale traders, as to be expected, lie between that of small- and large-scale traders. The above-mentioned sums would enable small-scale traders to purchase 6 – 8 cattle, medium-scale traders 11 – 16 cattle, and large-scale traders 25 to 37 cattle[4].

[4] Large-scale export traders often buy animals in multiples of 35, which is the number that makes up a truck load of animals.

Table 4.3: Livestock traders' categories, start-up capital requirements and average number of trade animals per trip

VARIABLE	LOCATION		
	Sikasso (n = 46)	Bittou (n = 32)	Niangoloko (n = 31)
Average start-up capital (1000 CFA franc)			
Small scale traders	460 (390)	480 (460)	1,500 (1000)
Medium scale traders	1,170 (990)	950 (870)	3,300 (1,900)
Big traders (exporters)	3,100 (2,150)	2,600 (1,800)	7,700 (3,900)
Number of animals purchased on a typical trip			
Small scale traders	5.7 (2.5)	7.1 (10.2)	7.5 (2.2)
Medium scale traders	10.9 (7.6)	13.1 (18.1)	16.0 (3.9)
Big traders (exporters)	27.4 (13.9)	25.3 (22.4)	37 (4.0)

When the financial requirements for active participation in the various categories of livestock trade are taken into consideration it becomes clear why some traders have to start as agents and others as brokers or in partnership with other traders, as Table 4.3 shows, in order to build enough capital to participate in the trade. One surprising fact is that as much as 97% of the traders said that they were using their own funds and 94% were not in partnership with others as would have been expected. The fear of losing money and conflicts with partners were mentioned by traders and seemed to partly explain the low levels of partnerships encountered.

Even though 97% of the traders used their own funds, there was a clear indication that they yearned to move to higher rungs of the ladder e.g. from small-scale ruminants' trader to small-scale trader in cattle and on to export cattle trade, and this required additional funding from external sources which was not readily available to many of them. In other words, their own money was not enough for the type of business they aspired to do. For small-scale traders, their ambition was for vertical expansion to the highest rung of export trading while for the export trader the aspiration was for horizontal expansion, i.e. being able to export 3 truckloads loads of animals at a time instead of two. If a small-scale cattle trader in Sikasso were to move on to become a medium-scale trader, he would to build up own capital from about 460,000 CFA to 1,170,000 CFA (Table 4.3) or obtain credit of about 700,000 CFA to bridge the gap. Similarly, a medium-scale trader in the same market would need a capital boost of about 2 million CFA to break into export trading. Table 4.2 shows that only about 14% of the traders have been able to obtain credit (mostly at high interest rates) to transact business. It is worth mentioning at this point that small ruminant traders share similar characteristics with cattle traders. About 28% of the cattle traders interviewed in Niangoloko were originally small ruminant traders who made enough money to join the cattle trade. Many small ruminant traders also wanted to move over to cattle trade because they felt that the small ruminant sector of livestock trade was under-developed compared with cattle trade.

Analysis also showed that the number of cattle traded per trader increased along the marketing channel from the collection- to terminal-markets and so also the degree of market concentration, leaving only few large-scale export traders because a large number of the small-scale traders withdraw being unable to mobilise enough cash, from personal

and credit sources, to participate in the capital intensive cross-border trade. In effect, while domestic marketing involved all actors, cross-border trade was almost entirely the exclusive preserve of big-time entrepreneurs. The degree of market concentration, i.e. the fewer number of traders to buyers at the export end of the marketing chain suggests a relatively less competitive environment compared to the situation in the domestic scene where there are many traders participating in the market. Our finding of a higher degree of market concentration in the export segment of the livestock marketing chain is consistent with what Little (1992) found in the Horn of Africa. The above discussion shows that there is a demand for credit in financing livestock trade and there are opportunities to further develop this trade, particularly small ruminant trade.

4.3 Market institutions

The markets encountered in this study are not different from other markets for live animals in other parts of sub-Saharan Africa. It is well known that when market information on prices and supplies of livestock and objective standards for selling and buying animals are not available, the purchase price of an animal will reflect not only the bargaining skills of both buyer and seller but also the buyer's preference for the characteristics of the animal. The search for animals with qualities that appeal to the buyer, the negotiations, payment and transfer of ownership are costly (time consuming) and there are many cases of failed transactions when buyer and seller are 'strangers' in a market system that is highly personalised. Sometimes, these transactions costs are so high – exceeding the expected benefit – that no exchange takes place. When transactions costs are high, market institutions (e.g. brokers, market associations, social networks) emerge to lower costs and enable exchange to take place. The roles and functions of some of these actors and organizations in the livestock markets studied are discussed in the following sections.

4.3.1 The role of intermediaries (brokers) in livestock trade

The role of intermediaries in the marketing chain starts with assisting a buyer to shorten the time spent in searching for a seller with the types of animals the buyer wants. Intermediaries provide information on market prices, types, grades and number of animals in the market; linking buyers to sellers and moderating negotiations thereafter; enforcing the terms of the exchange by collecting money from the buyer and paying the seller; witnessing the transfer of animals from seller to buyer; arranging the grouping and eventual transportation of purchased animals. By acting *ex ante* to provide market information, participating in the negotiations and enforcing contractual obligations *ex post*, intermediaries perform key functions that influence market transactions costs. Their participation in the negotiation process actually cuts down on the number of negotiations that would otherwise have failed, but may lower marketing margins for traders.

In the case of Sikasso, traders used brokers in only 6% of the transactions in villages and collection markets and in 4% of the transactions at the frontier market. At the point of resale, which could be anywhere between the collection and terminal markets but mostly at the terminal markets, the roles were reversed as brokers conducted up to 97% of the sales on behalf of the traders. This was due to the fact that traders who operated from the

Sikasso frontier market were mostly indigenes of Mali, so between the farm-gate and frontier market their transactions were with people with whom they shared similar socio-cultural background and therefore they required no intermediary in most cases. On the other hand, at the terminal market in Côte d'Ivoire where they are 'strangers', they handed over to local brokers. Even in the case of Bittou where the bulk of livestock export traders were Ghanaians, the same trend was observed for sales in Accra. The Ghanaian traders left 83% of the trading transactions entirely to local brokers with the remaining 17% done jointly by both traders and local brokers.

Another reason for using brokers is related to attempts to sell as many animals as possible in cash. In this case, handing most of the selling to brokers is strategic since brokers are less likely to negotiate to sell animals that did not belong to them on credit, i.e. without the express permission of the owner. It then becomes convenient for a trader who does not want to sell on credit to be out of sight and out of hearing during sale transactions.

Though costs and benefits are discussed later in a separate chapter, it is noteworthy that brokers performed their functions, in all the study markets, at a uniform fee of 500 CFA franc per head of cattle. A flat fee is a way of avoiding trader-broker conflicts. Nonetheless, as mentioned earlier, in all the markets brokers saw their position in the marketing chain as a stepping stone in their march to become a full-fledged trader.

4.3.2 Market associations and livestock trade

The Cooperative de Commerce de Bétail de Sikasso (COBAS) of Mali and the Union Nationale des Associations de Commerçants et Exportateur de Bétail du Burkina Faso (UNACEB) were the two most important livestock traders associations encountered in the frontier markets. As already mentioned, a large proportion of the traders that participated in the surveys were members of these market associations in their respective countries. In Sikasso, many of the traders interviewed revealed that they joined COBAS mainly to reduce search time for trucks used in exporting animals, solve administrative and social problems related to operating in the frontier market, obtain cheaper feeds sold to members and get an allocation of space for livestock fattening in the stalls available in the market. For traders interviewed in Bittou and Niangoloko, UNACEB played an important role in obtaining credit from a bank for lending to its members. This was a very highly appreciated service according to more than 90% of the traders. About 50% of the traders mentioned that they joined the association for solidarity, 19% to have access to market information and16% joined in order to be able to control or fix livestock prices. Traders who belong to these associations paid membership fees ranging from 3,500 to 5,000 CFA and annual dues of about 1,500 CFA.

When traders were asked to list the constraints to livestock trade in order of importance, insufficient capital was listed as the most limiting constraint by 91% of the traders in Bittou, 42% in Sikasso and 34% in Niangoloko. Although the percentage of traders listing this constraint in Bittou and Niangoloko may seem comparatively low, no other constraint was ranked higher than credit in the two sites. The most important constraints to livestock marketing as listed by the livestock traders were as follows:

- Limited capital and difficult access to credit

- Too many formalities, fees and taxes (legal and illegal) paid during trips
- Shortage of trucks at the frontier markets to transport animals to terminal markets
- Lack of cattle corridor for trekking animals to frontier markets
- Shortage of livestock feed at the frontier market
- System of selling on credit to buyers which lengthens the time to recover capital outlay.

Other minor constraints listed include:

- Lack of watering points along the animal trekking routes
- Lack of training for traders in different aspects of livestock marketing
- Limited external market outlets in other countries
- Insufficient support from livestock traders' associations
- Lack of security (risk of losing animal or money along the trading route).

Given the functions of the local-level organizations and the constraints to livestock trade listed by the traders, it is obvious that the emergence and existence of market associations is in response to market failures that the public sector has not been able to respond to and which tend to increase the costs of transacting business. On the other hand, some of the activities of these associations (e.g. acting in concert to regulate prices) may increase the cost of meat to consumers and reduce both consumer and producer's welfare. In this situation, state intervention may be needed to curb such activities and prevent consumer and producer's exploitation.

4.4 Livestock flows in the marketing channels

The study did not reveal any regulation compelling producers to sell or buy from particular markets (e.g. farm gate, collection or frontier) or through particular agents (e.g. the small itinerant trader, medium-scale or large-scale trader). As such, the flow of livestock through the channels reflected efforts by producers to sell their animals through channels that provided better prices and the strategies of traders to buy through channels where they had a higher chance of making more profit. For example, in Sikasso, farmers sold most of their animals at the farm gate to export traders in sharp contrast to Bittou where farmers sold about 40% of their animals at the frontier market. How sale strategies are influenced by transportation, handling and transactions costs are discussed later in chapter 6. The aim here is to simply point to the varying importance of different marketing channels in different countries.

Out of the 7404 cattle transactions recorded in Sikasso frontier market during the study period, 3919 or 52.9% were purchased by export traders directly from farm gates, while 3418 or 46.2% passed through collection markets (Figure 4.10). Export traders purchased 1309 of the 3418 cattle that reached collection markets. Export traders operating in the Sikasso market buy most of their animals around the farm gate and not in the frontier market. As a result, almost all the animals that reached the Sikasso frontier market were purchased for domestic slaughtering. This limited the role of the market to a location for regrouping export animals mainly. Given the relatively large capital outlays of export

traders, their trading activities at the farm gate are expected to influence prices and competition at that level.

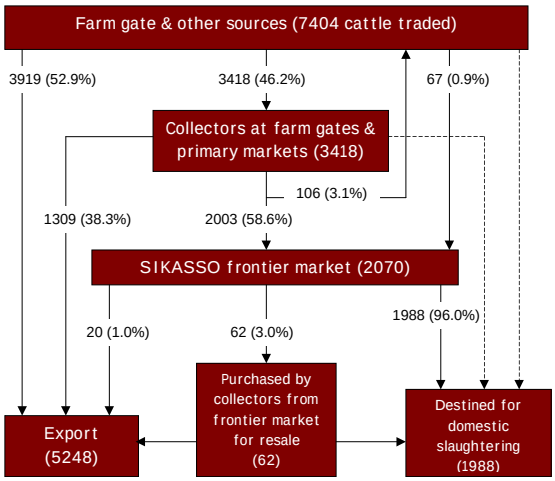

Figure 4.10: Livestock market structure and volume of flows of cattle through Sikasso livestock frontier market, January 2000 – June 2001. [Dotted lines show marketing channels known to exist but not investigated].

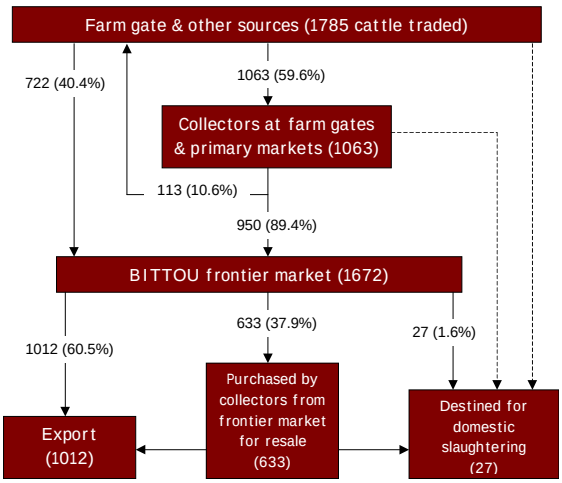

Figure 4.11: Livestock market structure and cattle flows through Bittou (Burkina Faso) livestock frontier market, January 2000 – June 2001. [Dotted lines show marketing channels known to exist but not studied].

In contrast to the situation in Sikasso, the 1012 cattle purchased for export in Bittou bought from the frontier market (Figure 4.11). In this case, the contact between livestock producers and export traders occurred not at the farm gate but at the frontier market where they (producers) brought 722 cattle or 40.4% of the traded cattle. Collectors played a relatively more prominent role in this marketing channel compared to Sikasso – about 60% of the cattle passed through the collection markets and even at the frontier market, collectors remained active and purchased 38% of the 1672 cattle that reached there, with the sole aim of reselling them in the same market for a profit. The trade in sheep and goat was found to be very similar to that of cattle (Figure 4.12).

The traders' survey showed that in value terms, a large part of the export trade in cattle as well as sheep and goats in Bittou was in the hands of Ghanaians. The level of transactions undertaken by Ghanaians in Bittou explains, at least in part, the enduring role of collectors (who are Burkinabes) in this market.

The livestock marketing channels around Niangoloko were found to be different from those of Sikasso and Bittou in that all 2230 traded cattle passed through collection markets (Figure 4.13). Out of the 1290 cattle destined for export from the above, 891 and 399 were purchased by export traders from collection and frontier markets, respectively. A point of similarity between Niangoloko and Bittou is that collectors continued to play very prominent roles in the marketing chain up to and including the frontier market where they bought and resold 58.6% of the cattle that reached the frontier market compared to only 3% in the case of Sikasso. This behaviour of collectors in the Bittou and Niangoloko markets may be a peculiar feature of livestock trade in Burkina Faso.

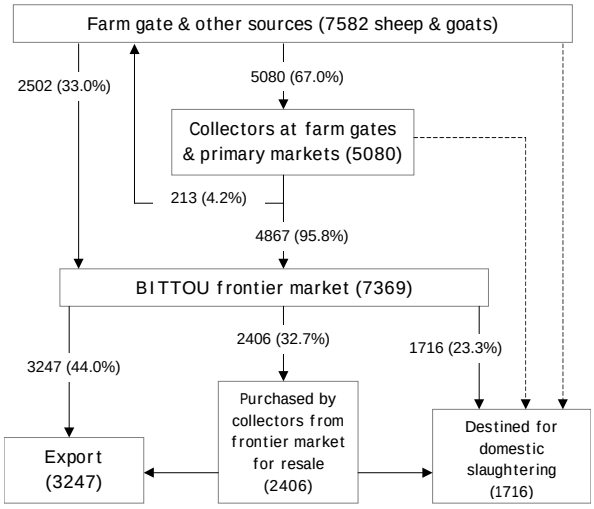

Figure 4.12: Livestock market structure and volumes of sheep and goats flows through Bittou (Burkina Faso) livestock frontier market, January 2000 – June 2001. [Dotted lines show marketing channels known to exist but not studied].

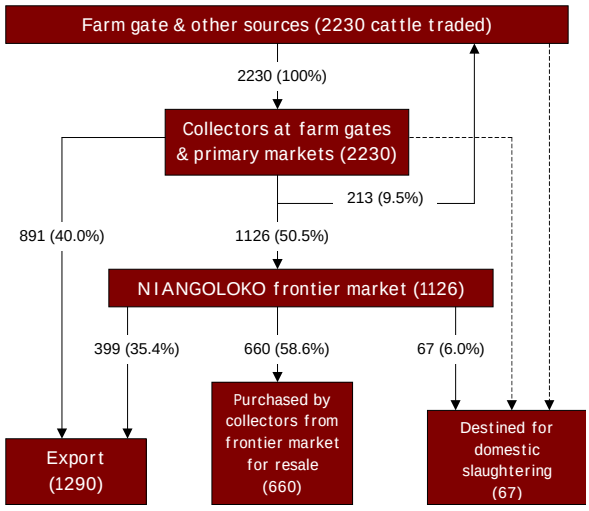

Figure 4.13: Livestock market structure and cattle flows through Niangoloko (Burkina Faso) livestock frontier market, January 2000 – June 2001. [Dotted lines show marketing channels known to exist but not studied].

4.5 Summary

Domestic and cross-border livestock marketing channels around the study sites were found to be uncomplicated though they varied slightly from one site to another. The Sikasso case presented the simplest and least sophisticated of the marketing channels with its high proportion of direct exchange between livestock producers and export traders, while the Niangoloko market case presented the most complex case where all traded animals passed through collection and frontier markets before export. Even in this latter case, where the marketing chain is long, it did so only in terms of the number of market players involved because the principal value-added activity remained the transfer of animal from the farm gate to the terminal markets. There was a notable absence of processors (if local butchers are excluded) in the marketing channels studied, particularly the cross-border segment. This points to a potential opportunity that could be usefully explored as a means of adding value to intra-regional livestock trade and creating additional employment in the livestock sector.

The results confirm that livestock markets in the region are dyadic as in most livestock markets involving pastoral systems in sub-Saharan Africa. A very positive finding was that there were no regulations compelling producers to sell or buy from particular markets (farm gate, collection or frontier) or through particular agent (e.g. the small itinerant, medium- or large-scale trader). This implied that farmers who sold most of their animals at the farm gate as in Sikasso, for example, could have done so as a strategy to avoid the high transport, handling and transactions costs that would otherwise be involved in selling at the frontier market. This contrasts sharply with Bittou where farmers themselves took a large proportion of their animals directly to the frontier market, the reason being that the villages of origin of the animals sold were within two days' trekking distance to the frontier market and this eliminated high transportation (trucking) costs making it possible for many more producers than elsewhere in this study, to participate directly near the consumption end of the production-to-consumption marketing chain.

While all traders (itinerant, collectors and export) participated in the domestic segment of the marketing chain, only the large-scale traders were involved in the export segment, as inadequate capital and limited access to credit served as entry barriers and restricted the number of traders able to participate in cross-border trade.

Trade in small ruminants still remained relatively undeveloped as traders operating in the markets abandoned it in favour of cattle trade once they have accumulated sufficient capital to move to the more lucrative cattle trade.

Market institutions, particularly livestock traders' associations have emerged to facilitate intra-regional trade. The extent to which they help to lower costs and improve traders' margins will be seen when the costs and benefits of trading activities are estimated and discussed in Chapter 6. There was a notable absence of high profile producers' associations similar to the traders' associations to champion the cause of the poor, small-scale livestock producers.

5 DETERMINANTS OF LIVESTOCK PRICES AND POTENTIAL EFFECTS OF PRICE VARIATIONS ON PRODUCERS AND TRADERS' INCOMES

In this chapter we examine the factors influencing livestock prices and the extent to which inter-market and temporal price variations could potentially affect the incomes of livestock producers and marketers in the study countries.

5.1 Livestock price formation

In the study countries as in most of SSA, information on market prices and supplies of livestock to markets is not available on a regular basis and is sometimes completely lacking. In addition, there are no uniform standards (e.g. price per kg liveweight for buying and selling animals), resulting in long negotiations between buyers and sellers. Under these conditions, the purchase price of an animal will reflect not only the bargaining skills of both buyer and seller but also the buyer's preference for the characteristics of the animal (sex, age, colour, breed, body condition), the purpose of purchase (resale, slaughter, fattening, breeding, draught power) and season of the year (Andargachew & Brokken, 1993; Jabbar, 1997). Using animal and market characteristics as independent variables, Andragachew and Brokken (1993) estimated explicit quadratic price determination models for each of the market types they studied (i.e. redistribution, intermediate and terminal). Such explicit models contain a large number of qualitative variables each with an equally large number of categories sometimes making interpretation of results cumbersome. Jabbar (1997) used the Analysis of Covariance (AnCov) technique to formulate a hedonic price determination model following Johnston, 1972 and Cowell & Todd, 1980.

For this study, a hedonic price model based on Analysis of Covariance (AnCov), was also used to determine factors influencing livestock prices. The model may be written as:

$$Y_i = \beta_0 + \beta_1 X_{i1} + \beta_k X_{ik} + \phi_2 Z_2 + \phi_3 Z_3 + \ldots + \phi_n Z_n + \varepsilon_I \qquad \text{.....(1)}$$

where Y_i is price of an animal; Xs are covariates e.g. age; Zs are factors each with at least two categories (e.g. sex, body condition rating, breed, season of sale); and β and ϕ are parameters to be estimated. Portugal and von Oppen (1999) eliminated day-to-day variation in prices utilized for their hedoic model through constructing a reference value based on the average price per survey interval, while Turner and Williams (2002) equalised the residual variance through a log transformation of price. Both of these price transformations were tried and the log transformation provided a better fit with the coefficients having signs that were consistent with theoretical expectations. Thus, the empirical model estimated was specified as:

$$\ln(price) = \beta_0 + \beta_1 AGE + \beta_2 AGE^2 + \phi_1 SEX + \phi_2 COND + \phi_3 BRD + \phi_4 COL + \phi_5 POP + \phi_6 TOS + \phi_7 TOB + \phi_8 SOS + \phi_9 FM + \varepsilon_i \qquad \text{.....(2)}$$

where *AGE* = age of animal (in years), *SEX* = sex (castrate, female, male), *COND* = body condition rating (very lean, lean, good, very good, excellent), *BRD* = breed, *COL* =

dominant colour, *POP* = purpose of purchase, *TOS* = type of seller, *TOB* = type of buyer, *SOS* = season of sale (cool dry, hot dry, rainy, harvest) and *FM* = frontier market.

There was an attempt to use the traders' survey to arrive at peak and off-peak sale periods but the periods given by the traders varied too widely. As a result, the above seasons of sale used by Turner and Williams (2002) were used initially in the econometric models. Separate models were fitted for:

i. all types of traded cattle (e.g. cattle sold for slaughter or destined for export) in the three markets (combined and independently),

ii. separate models for export cattle in each of the three markets with respect to season of sale and,

iii. sheep and goats (combined) for Bittou market.

5.1.1 Description of variables in the model

Table 5.1 describes some of the quantitative data. Facilities for weighing cattle were not available in the Sikasso frontier market at the time of the study. Instead, cattle were measured for girth of the thorax, body length and height at shoulder point. Later, accurate carcass weights obtained for measured animals that were slaughtered at the local abattoir were regressed against the body measurements to derive parameters for estimating the liveweight of cattle exported through Sikasso. The resulting equation with $R^2 = 0.59$ and *t*-ratios in parentheses is as follows:

Liveweight =	-469.15	+ 1.970 height	+ 2.914 girth	+ 0.757 length	
	(-19.196)	(8.549)	(18.652)	(3.645)	…..*(3)*

The cattle weights reported in Table 5.1 for Sikasso were estimated from equation 3 and are comparable with those of Bittou and Niangoloko obtained directly from weighing live animals.

Table 5.1: Descriptive statistics for recorded cattle transactions at the Sikasso, Bittou and Niangoloko frontier livestock markets, January 2000 – June 2001.

Parameter	Market				S.E. (mean)
	Sikasso	Bittou	Niangoloko	All	
Age of cattle (years)	7.68	4.99	5.61	6.85	0.02
Weight (kg)	256.35	250.30	253.15	253.34	1.04
Total present	113.79	80.24	17.32	73.63	0.61
Total sold	38.70	53.81	15.34	34.32	0.27
Percentage of total sold	35.59	65.73	87.87	60.48	0.33
Price at initial market (FCFA)	89508	96721	83481	87932	584
Price at frontier market (FCFA)	107511	98550	90794	102950	335

Table 5.1 shows that cattle were generally marketed at about 7 years of age weighing approximately 250 kg, equivalent to one Tropical Livestock Unit (TLU). Cattle from Burkina Faso i.e. Bittou and Niangoloko were marketed at 5 years of age (2 years earlier

than in Mali – Sikasso). Since it is normal for cattle to attain this liveweight from about 4 years of age, the lower age at marketing in Bittou and Niangoloko suggests that off-take rate was higher in Burkina Faso than in Mali. Sikasso was a bigger market than either Bittou or Niangoloko and this is seen in the number of animals presented for sale each market day. A higher percentage of the animals brought to the markets in Niangoloko and Bittou markets were sold compared to the situation in Sikasso. Table 5.2 summarizes the sex, age and body conditioning characteristics of the animals sold in all the markets.

Table 5.2: Sex distribution of cattle purchased for various purposes from Sikasso, Bittou and Niangoloko frontier markets, January 2000 – June 2002.

Market	Sex	Purpose of purchase					Total	% of total resold/ exported
		Slaughtering	Fattening	Traction	Breeding	Resale/Export		
Sikasso	Female	1438	5	0	51	544	2038	23.6
	Male	143	4	10	22	1455	1634	89.0
	Castrate	404	7	7	0	3301	3719	88.9
	Total	1985	16	17	73	5300	7391	71.7
Bittou	Female	13	3	4	8	593	621	95.5
	Male	12	40	55	3	1001	1111	90.1
	Castrate	0	0	0	0	46	46	100
	Total	25	43	59	11	1640	1778	92.2
Niangoloko	Female	54	1	2	43	698	798	87.5
	Male	13	14	136	15	942	1120	84.1
	Castrate	0	1	1	0	310	312	99.4
	Total	67	16	139	58	1950	2230	87.4
All markets	Female	1515	9	6	102	1835	3457	53.1
	Male	168	58	201	40	3398	3865	87.9
	Castrate	404	8	8	0	3657	4077	89.7
	Total	2087	75	215	142	8890	11399*	78.0

*the difference between this figure and the total 11,419 recorded cattle transactions means that 20 cases were voided for incomplete data.

The table showed that only a small proportion of the female cattle presented for sale were actually sold for export in Sikasso. Considering that cattle sold in Sikasso were 2 years older, then two factors namely age and sex may have counted against the sale and export of female cattle from Sikasso.

Table 5.3 presents the sex and age characteristics of sheep sold for different purposes in Bittou. Here both male and female animals of all ages appeared to be equally purchased for export and resale.

Table 5.4 shows that as the body condition rating of cattle presented for sale improved, a higher percentage got purchased for export, as expected. In Sikasso, 93.9% of cattle in excellent condition and 100% of similar animals in Niangoloko were sold for export. The above results suggest that for export purposes, old female cattle were the least preferred while male cattle and castrates were the most preferred. The same cannot be said for sheep where there appeared to be no export-buyer preference based on sex or age.

Table 5.3: Age and sex distribution of sheep purchased for various purposes from Bittou frontier market, January 2000 – June 2001.

Age group	Sex	Purpose of purchase					Total	% of total for export/ resale
		Slaughtering	Fattening	Gift	Breeding	Resale/Export		
< 2 years	Female	36	2	0	12	45	95	47.4
	Male	29	4	0	3	81	117	69.2
	Castrate	0	0	0	0	0	0	0.0
	Total	65	6	0	15	126	212	59.7
2-4 years	Female	142	0	0	18	468	628	74.5
	Male	158	11	0	0	324	493	65.7
	Castrate	5	0	0	0	23	28	79.3
	Total	305	11	0	18	815	1149	70.9
> 5 years	Female	278	2	0	56	972	1308	74.3
	Male	239	7	0	2	681	929	73.3
	Castrate	5	0	0	0	6	11	54.5
	Total	522	9	0	58	1659	2248	73.8
All ages	Female	456	4	0	86	1485	2031	73.1
	Male	426	22	0	5	1086	1539	70.6
	Castrate	10	0	0	0	29	39	74.4
	Total	892	26	0	91	2600	3609	72.0

Table 5.4: The rating of body condition of cattle purchased for various purposes from Sikasso, Bittou and Niangoloko frontier livestock markets, January 2000 - June 2001.

Market	Condition rating	Purpose of purchase					Total	% of total for export/ resale
		Slaughtering	Fattening	Traction	Breeding	Export/ resale		
Sikasso	Very lean	14	0	0	0	0	14	0.0
	Lean	339	8	0	4	34	385	0.9
	Good	1246	6	11	63	2494	3820	65.3
	Very good	346	2	4	1	2263	2616	86.5
	Excellent	31	0	0	0	476	507	93.9
Bittou	Very lean	5	0	0	0	51	56	91.1
	Lean	4	6	7	2	328	347	94.5
	Good	6	22	38	7	698	771	90.5
	Very good	7	14	14	1	485	521	93.1
	Excellent	3	1	0	1	75	80	93.8
Niangoloko	Very lean	5	0	0	0	1	6	16.7
	Lean	30	2	1	1	77	111	69.4
	Good	24	12	128	51	845	1060	79.7
	Very good	7	2	10	6	549	574	95.6
	Excellent	0	0	0	0	475	475	100
All markets	Very lean	24	0	0	0	52	76	68.4
	Lean	373	16	8	7	439	843	50.1
	Good	1276	40	177	121	4037	5651	71.4
	Very good	360	18	28	8	3297	3711	88.8
	Excellent	34	1	0	1	1026	1062	96.6
	Total	2067	75	213	137	8851	11343*	78.0

*the difference between this figure and the total 11,419 recorded cattle transactions means that 76 cases were voided for incomplete data.

5.1.2 Buyer preferences for cattle, sheep and goats

Table 5.5 summarises the results of the price formation models for cattle for multiple- and single-market cases. The models had R^2 values ranging from 0.67 for the Sikasso market to 0.76 for Niangoloko market. For cross-sectional surveys, the ability of independent

variables in the model to explain more than 67% of the variability in the prices paid for cattle in the frontier markets is considered an indication of good model fit, particularly since the resulting coefficient also had the expected signs.

The model results show that for biological characteristics, buyers paid a premium for heavily built, castrated zebu cattle in excellent body condition. This confirms the earlier inferences drawn from simple statistical summaries. As can be seen from Table 5.4, smallholder producers are not yet making the most of the fact that excellent finishing of cattle attracted a premium, as only about 10% of the cattle traded were rated as being in excellent body condition. A large proportion (about 85%) of these cattle were only in good to very good condition and based on the price differentials, efforts to finish animals properly before marketing will be well compensated. Female cattle attracted the least price compared to males and castrates. The coefficient of female cattle category of –23.0 ($p < 0.001$) for Sikasso compared to –17.4 ($p < 0.001$) for Niangoloko and –12.4 ($p < 0.001$) for Bittou in Table 5.5 confirms that females marketed through Sikasso attracted even much lower prices probably due to being much older. The implication is that if farmers wish to get good market price for their female cattle, then they must make the decision to cull them early i.e. preferably before they are up to 7 years old as this study shows that after that age their market value rapidly depreciated. This is further supported by the fact that the coefficients for *age* and age^2 had positive and negative signs, respectively, meaning that after a certain age (probably around 7 years), the price offered for cattle declined.

Among the market factors, the purpose of purchase, type of seller, type of buyer, season of sale and the related frontier market, were very highly significant. Compared to prices offered for export cattle, those purchased for gifts, fattening and slaughter attracted lower prices in that descending order. This is not surprising as animals meant for fattening are mostly growing, lean animals which would attract relatively lower prices. Livestock producers will, therefore, do well to target their finished animals at the export market just as traders interested in fattening for resale should source their stock from the cheaper, lean to very lean animals.

In general, itinerant traders and collectors sold animals at higher prices to export traders than producers and other sellers were able to sell. Also, producers when they bought animals paid the lowest prices compared to other buyers.

In Niangoloko, however, producers not only paid more when buying but were offered the least prices when selling livestock. This is probably because in Niangoloko, producers do not take their animals directly to the frontier market and when they sell at the farm gate, it is to itinerant traders and collectors rather than to export traders, as was the case in Sikasso. Since in Sikasso, only a negligible part of the traded cattle were sold by producers directly at the frontier market, then it must be that export traders offered more for the same animal than itinerant traders and collectors. This suggests that producers would benefit more if they produce for the export market and deal as much as possible with traders engaged I cross-border trade.

Table 5.5: Estimated coefficients (× 100) and t-ratios of multiple- and single-market analysis of covariance (AnCov) models used to estimate *ln* (price) of cattle at Sikasso, Niangoloko and Bittou livestock markets, January 2000 – June 2001.

Parameter	Market							
	All 3 frontier markets		Sikasso		Niangoloko		Bittou	
	β	t-ratio	β	t-ratio	β	t-ratio	β	t-ratio
Intercept	1133.6****	184.867	1113.9****	90.772	1114.0****	111.374	1153.4****	75.663
Biological characteristics								
Age	14.5****	34.764	11.4****	17.682	13.4****	17.836	18.8****	19.376
Age^2	-0.84****	-29.557	-0.65****	-15.435	-0.82****	-15.996	-1.182****	-14.508
Sex of animal								
Female	-19.00****	-31.443	-23.0****	-31.783	-17.4****	-11.152	-12.4****	-3.434
Male	0.69	1.263	4.38****	6.883	-3.08**	-2.184	-3.27	-.950
Castrate	0.00	.	0.00	.	0.00	.	0.00	.
Condition score								
Very lean	-89.2****	-35.441	-104.2****	-19.391	-64.6****	-6.805	-87.2****	-21.606
Lean	-68.6****	-62.908	-68.1****	-44.292	-62.3****	-26.396	-66.6****	-22.434
Good	-45.9****	-56.840	-44.1****	-40.437	-46.2****	-31.743	-42.8****	-15.659
Very good	-19.8****	-26.294	-17.7****	-17.639	-23.7****	-18.716	-17.5****	-6.598
Excellent	0.00	.	0.00	.	0.00	.	0.00	.
Breed of animal								
Other	-15.7****	-5.325	n/a	n/a	n/a	n/a	-24.4****	-5.266
Local	-14.4****	-5.808	n/a	n/a	n/a	n/a	-15.1****	-4.848
Dgog	-2.80****	-2.514	-2.75**	-2.487	n/a	n/a	n/a	n/a
Mery	-16.5****	-9.943	17.9****	5.433	n/a	n/a	n/a	n/a
Meti	-9.3****	-17.148	9.74***	2.972	5.70****	3.935	n/a	n/a
N'Dama	-19.0****	-5.621	n/a	n/a	14.5****	8.756	n/a	n/a
Zebu	0.00	.	0.00	.	0.00	.	0.00	.
Marketing factors								
Purpose of purchase								
Slaughtering	-6.74	-1.246	1.88	.160	-20.7**	-2.564	-12.6	-.911
Fattening	-10.1****	-3.064	1.73	.266	-26.9****	-4.412	-2.35	-.369
Gift	-42.9***	-2.832	-17.5	-1.453	n/a	n/a	-53.0**	-2.569
Labour	-7.93	-1.409	17.3*	1.783	-26.1****	-3.589	20.4**	1.934
Breeding	0.42	.113	n/a	n/a	5.11	1.051	-0.0005	-.001
Local resale	1.06	1.481	-6.88	-2.356	-0.70	-.646	11.8****	3.411
Export	0.00	.	0.00	.	0.00	.	0.00	.
Type of seller								
Farmer	3.76	1.161	7.47**	2.184	-28.6****	-3.647	1.84	.842
Trader	6.46**	2.006	9.89***	2.904	-25.9****	-3.296	7.43****	5.588
Breeder	4.83	1.493	9.89***	2.870	-24.7****	-3.272	0.00	.
Others	0.00	.	0.00	.	0.00	.	6.67**	2.257
Type of buyer								
Farmer	-5.75	-1.103	n/a	n/a	17.1***	2.684	-409**	-2.665
Trader	-3.81	-.781	3.59	.330	-0.73	-.119	-24.1*	-1.801
Breeder	-10.8**	-2.427	-40.0****	-3.785	-6.14	-1.041	-16.7	-1.229
Butcher	-1.11	-.297	0.51	.117	-1.55	-.205	0	.
Others	0.00	.	0.00	.	0.00	.	n/a	n/a
Season of sale								
Cool dry	3.59****	6.138	4.54****	6.414	-1.16	-.879	3.26**	2.135
Hot dry	12.0****	19.651	11.8****	15.313	13.4****	11.328	9.12****	5.479
Rainy	6.76****	11.586	4.31****	6.159	10.5****	8.643	9.944****	5.211
Harvest	0.00	.	0.00	.	0.00	.	0.00	.
Frontier market								
	-10.9****	-11.871	n/a	n/a	n/a	n/a	n/a	n/a
	16.0****	6.347	n/a	n/a	n/a	n/a	n/a	n/a
	0.00	.	n/a	n/a	n/a	n/a	n/a	n/a
Sample size	10853		7002		2106		1745	
R-squared	0.69		0.67		0.76		0.69	

**** p < 0.001, *** p < 0.01, ** p < 0.05, * p < 0.1 & n/a – variable not included in the model.

In the regression models, the cool dry season corresponds to January – March; hot dry season (April – June); rainy season (July – September) and the harvest season (October – December). The results show that compared to the harvest season when prices were at their lowest, the highest prices were obtained during the hot dry season in Sikasso and Niangoloko and during the rainy season in Bittou. Judging by the size of the coefficients of the season of sale, 2 broad trade periods seemed evident viz: i) October – March for off-peak and ii) April to September for peak sales. Following this new definition for peak

and off-peak sales period, it is seen that prices offered for cattle were higher during the peak sales period than in the off-peak period.

In sum, the regression models showed that producers would be better off if they produced castrated zebu cattle in excellent body condition and sold them directly to export traders during the peak period of April and September. However, the part of this conclusion concerning timing of sale should be treated with caution given that the surveys that provided data for the classification only covered one peak season and one off-peak season.

The models estimated for export cattle, sheep and goats revealed trends similar to those discussed above. Goats attracted higher prices than sheep except during *Tabaski* when prices offered for sheep were considerably higher (see Appendix 1 Table).

5.2 Seasonal variations in livestock flows

The peak (April – September) and off-peak (October to March) livestock trade periods estimated through the price formation models are further illustrated in Figure 5.1.

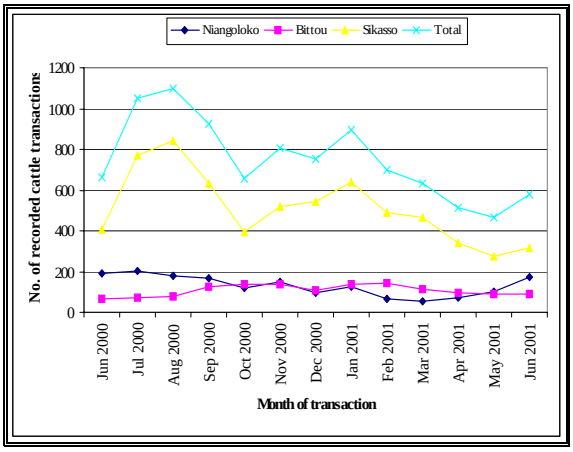

Figure 5.1: Cattle transactions recorded at Sikasso (Mali) and Niangoloko and Bittou (Burkina Faso) frontier markets, June 2000 – June 2001.

Figure 5.1 shows a build up in recorded cattle transactions that reached its peak in August 2000. Flows were, however, at their lowest ebb in May 2001 for the overall case, even though another build up towards peak season was already evident for Niangoloko from March 2001.

Combining the results of the models with local knowledge and reducing the emphasis on calendar months, it can be said that the off-peak period usually coincides with the period when the availability of livestock feed from natural pastures is low and animals are not in good body condition to attract good market prices, while peak period coincides with the rainy and early harvest season when feed supply is relatively abundant. This means that shifts in peak/off-peak periods could occur as a result of changes in annual rainfall pattern. Overall, during the peak period encountered in this study, sales of animals were at least twice as high as in the off-peak period.

5.3 Seasonal variation in livestock prices

As was the case for the volume of trade, livestock prices exhibited seasonal variation. Figures 5.2 and 5.3 show the variations in monthly prices per kg liveweight of cattle and sheep and goats observed in the frontier markets during the survey. Sheep and goats price showed less variation compared with cattle prices. During the months of November and December, high cattle prices were observed in the 3 markets. Cattle prices peaked during February 2001 in Sikasso and in April 2001 in Bittou and Niangoloko. Though the graphs clearly show variation over the survey period, this trend should be interpreted with caution given the relatively short survey period, which covered only one calendar year for the observation of price movements.

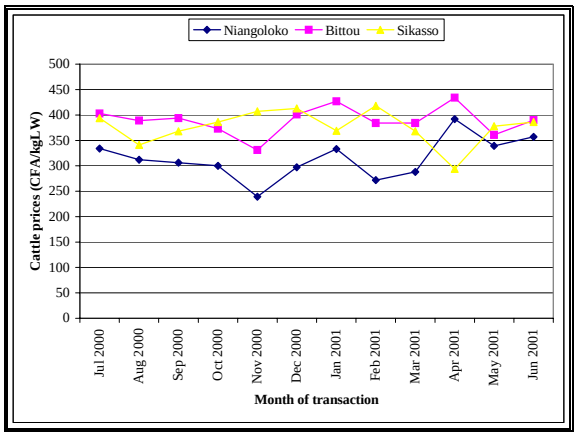

Figure 5.2: Seasonal variation in cattle prices in the Sikasso (Mali), Niangoloko and Bittou (Burkina Faso) frontier markets, July 2000 – June 2001.

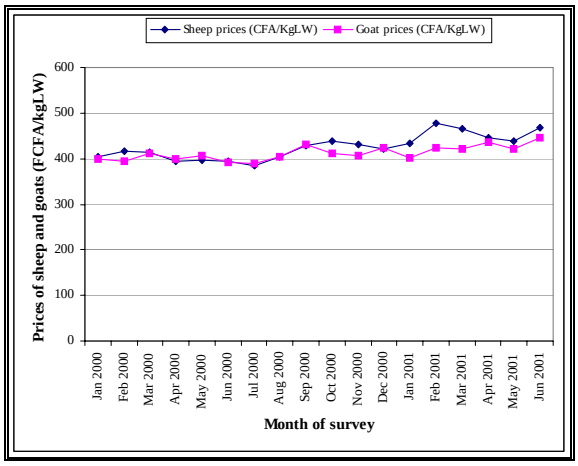

Figure 5.3: Seasonal variation in sheep and goats prices in the Bittou (Burkina Faso) frontier market, January 2000 – June 2001.

Table 5.6 shows that, except for sheep, which responded more to *Tabaski*, prices were significantly higher during the peak sales period than in the off-peak period. Within the peak season and judging by the coefficient of variation (CV), prices were most volatile (38%) for cattle that were traded or passed through Bittou and least for sheep prices in the same market. For the off-peak period, the coefficients of variation showed that prices of goats and sheep at the Bittou market were the least (23%) and most (41%) volatile, respectively. The differences in CV shown in the last column of Table 5.6 could be interpreted in terms of intra-species price volatility when the peak and off-peak price variations are considered.

The results indicate that small ruminant prices were more prone to exhibit fluctuations in prices compared with cattle prices. Considering cattle only, for the 3 frontier markets, prices were most volatile in Sikasso where the difference in the coefficient of variation was up to 5% compared to 3% in Bittou and –2% in Niangoloko.

Table 5.6: Seasonal variations in price of cattle, sheep and goat at the Sikasso, Bittou and Niangoloko frontier markets during peak sales (April – September) and off-peak sales (October- March) periods, July 2000 – June 2001.

Location and species of livestock [#]	Peak sales period			Off-peak sales period			Difference		
	Mean	Std. Dev.	CV (%)	Mean	Std. Dev.	CV (%)	Mean	Std. Dev.	CV (%)
Bittou	110333	41768	38	90068	32126	36	20265	9642	2
Niangoloko	95800	32919	34	78199	29210	37	17601	3709	-3
Sikasso	112237	37947	34	104674	30323	29	7563	7624	5
Bittou sheep	8058	1918	24	9767	3966	41	-1709	-2048	-17
Bittou goats	7560	2544	34	7494	1758	23	66	786	10

[#]Unless indicated, the species of livestock is cattle. CV = coefficient of variation. All mean prices for peak and off-peak periods were statistically different at 0.001 level of significance.

What these results indicate is that during the peak sales period both the supply of livestock and animal prices were high while both were low in the off-peak period. This being the case, farmers are better off selling their animals during the rainy and early harvest seasons when feeds are readily available from rangelands and harvested crop fields and animals are in good body condition to fetch higher prices.

Having seen how producers could be affected by seasonal variation in prices and volume of livestock trade, we also examined the case of how traders were affected by the same phenomenon. The seasonal variation in livestock prices equally affected livestock traders as investigations revealed that they are likely to make higher profits in the peak period than in the off-peak period, judging by the price spread between points of purchase and the frontier markets in both periods: 8401 and 4953 CFA franc in Niangoloko and 7354 and 5632 CFA franc in Bittou for cattle (Table 5.7). Within the peak period, prices varied most for cattle in Bittou market (CV = 84%) and least for cattle in Niangoloko (CV = 43%). Between peak and off-peak periods, trading in sheep appeared to carry the highest risk with a difference in coefficient of variation of –23% compared to –3% for cattle in Niangoloko.

Table 5.7: Seasonal variations in price spread (difference between price at frontier and collection markets) for cattle, sheep and goat traded or transiting through Bittou and Niangoloko frontier markets, July 2000 – June 2001.

Location and species of livestock [#]	Peak sales period			Off-peak sales period			Difference		
	Mean	Std. Dev.	CV (%)	Mean	Std. Dev.	CV (%)	Mean	Std. Dev.	CV (%)
Niangoloko	8401	3643	43	4953	2298	46	3448	1345	-3
Bittou	7354	6156	84	5632	4078	72	1722	2078	11
Bittou sheep	611	286	47	745	519	70	-134	-233	-23
Bittou goats	552	285	52	522	236	45	30	49	6

[#]Unless indicated, the species of livestock is cattle. CV = coefficient of variation. All mean price spreads for peak and off-peak periods were statistically different at 0.001 level of significance except for goats ($p < 0.01$).
NB: Due to data limitations, these calculation could not be done for the Sikasso frontier market.

5.4 Inter-market variations in livestock prices (market integration)

To investigate the spatial integration of livestock markets, bivariate correlation of prices between pairs of important sources of trade animals was undertaken to determine the extent to which prices moved together in important villages of origin of traded animals following Fafchamps & Gavian, 1996; Negassa & Jayne, 1997. A large number of collection markets made contributions ranging from 0.1 to 31% of animals sold at or passing through frontier markets but this part of the study focused on those that contributed 2.5% or more. More rigorous methods of testing for market integration and co-integration such as augmented Dickey-Fuller (ADF) test (Dickey & Fuller, 1979 and 1981), tests of stationarity (Engle & Granger, 1987), etc. were ruled out on account of data limitations. For the same reason, only the case of Bittou was investigated. Nevertheless, Geographic Information Systems (GIS) tools (DCW, 1995 and Arcview 3.2®) were applied to map the spatial distribution and proportion of contribution of the important collection markets to traded cattle. This was followed by a road network analysis to examine the extent to which travel time between buying and reselling points influenced participants' choice of collection markets.

The results showed that livestock collection markets around Bittou contributed (16.8%), Garango (4.2%), Koupela (7.3%), Oumnogue (18.2%), Pouytenga (15.7%) and Tenkodogo (19.4%) to the total number of animals sold in the Bittou frontier market and, therefore, qualified by our definition as important points of origin of livestock to the Bittou market. The correlation coefficients computed for pairs of these collection markets varied from –0.54 ($p < 0.05$) for the pair of Garango and Oumnogue to 0.55 ($p < 0.05$) for the pair of Garango and Tenkodogo. However, apart from the single pair that was negative and significant, all pairs relating to Tenkodogo in addition to the pair of Bittou and Pouytenga were positive and significant ranging from 0.4 to 0.5 ($p < 0.05$). The results suggest that livestock markets supplying cattle to the Bittou frontier market are largely related but probably not closely integrated.

The GIS map shows a north-south alignment of the collection markets with occasional overlap in the area covered by some of the markets as in the cases of Koupela and Pouytenga and Tenkodogo and Oumnogue (Figure 5.4). From the map it is seen that the single collection market (Garango) that had a negative relationship with Oumnogue is off the north-south trade axis used by most of the traders. This might have limited the amount of market information that the market had access to, hence its lack of integration with the mainstream north-south markets.

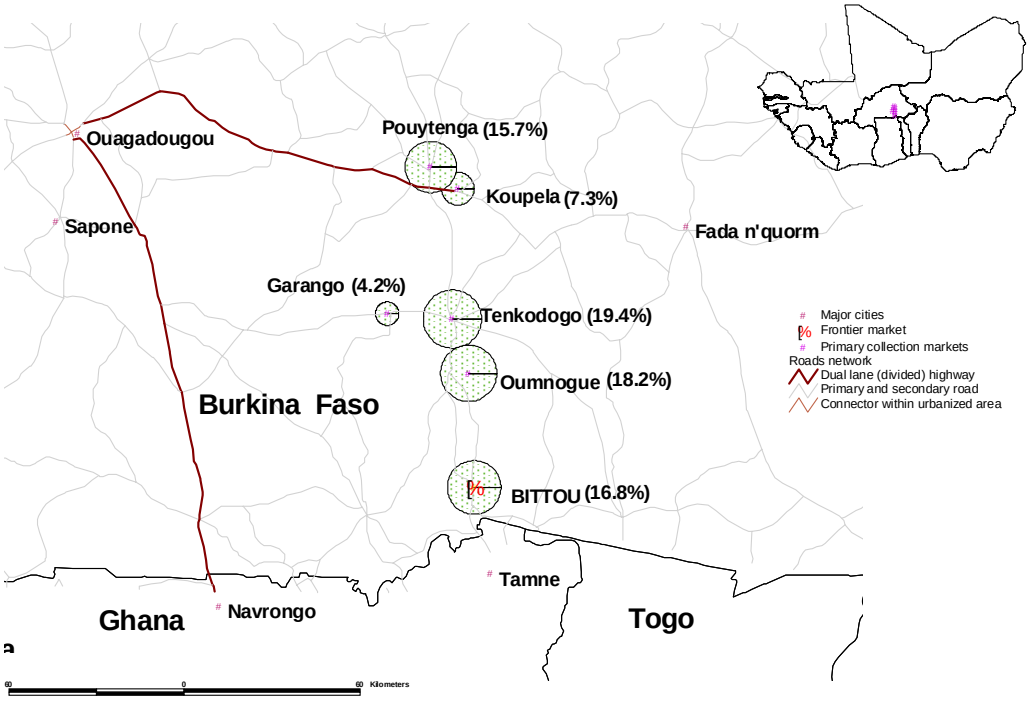

Figure 5.4: Map showing important collection markets and percentage supply of cattle from them to the Bittou frontier livestock market, January 2000 to June 2001.

It appeared that the north-south alignment of collection markets in the Bittou case played a vital role in the dissemination of market information. For example, a trader travelling from Bittou to Pouytenga to purchase cattle will along the way obtain the most current information about prices and animal supplies in Oumnogue, Tenkodogo and Koupela. At the same time as he gathers information, other traders along the same route also get to know from him the current situation at the frontier market. The trader-to-trader mode of passing market information appears to be working well along this axis and may have contributed to the positive relationship of livestock prices between most pairs of markets. Looking again at Figures 4.2 and 4.9 for Sikasso and Niangoloko and seeing the dispersed locations of their collection markets, it can be concluded that trader-to-trader market information dissemination may not work as well as in Bittou. This suggest that other ways, e.g. radio broadcasts, have to be employed to get all market participants informed about current prices and animal supplies.

The road network analysis revealed a nearly uniform network of primary and secondary roads within the study area and as such, the distance of each collection market to the frontier market proved to be directly proportional to the travel time from each collection market relative to the other. In addition, practically all cattle from these collection markets were trekked to the Bittou frontier market which further reduced the effect of road quality on travel time. For these reasons, it cannot be concluded that traders' preference of buying from particular collection markets, at least in the case of the Bittou

frontier market, was related to the economic cost per unit of travel time. This analysis reveals the important role that GIS tools can play in market studies.

5.5 Summary

This chapter identified the determinants of livestock prices and the nature and extent of variation in these prices which have impacts on income of livestock producers, traders and on intra-regional trade in livestock. Price formation was analysed using hedonic price models, while the extent of price variation and volatility in time and space were assessed using means, coefficients of variation and bivariate correlation.

Results of the price formation models show that buyers paid a premium for heavily built, castrated zebu cattle in excellent body condition. However, smallholder producers are not yet making the most of the fact that excellent finishing of cattle attracted a premium as only about 10% of the cattle traded were rated as being in excellent body condition. A large proportion (about 85%) of the animals were only in good to very good condition. Based on the price differentials, the results suggest that efforts to finish animals properly before marketing would be well compensated.

Market factors that influenced prices include the purpose of purchase, type of seller, type of buyer, season of sale. Prices offered for export cattle were higher than those paid for cattle meant for fattening, slaughter or gifts. This implies that livestock producers will be better off if they target their finished animals at the export market, just as traders interested in fattening for resale should source their stock from the cheaper, lean to very lean animals presented for sale. The analysis showed that export traders offered more for the same animal than itinerant traders and collectors. This suggests that producers would benefit more if they deal directly with traders engaged in cross-border trade.
Two distinct periods of animals sales were identified: i) October to March as off-peak sales period and ii) April to September as peak sales period. More animals were available for sale and prices offered for them were higher during the peak sales period than in the off-peak period.

The analysis of market integration showed that livestock markets supplying cattle to the Bittou frontier market were largely related but probably not closely integrated.

6 COSTS AND BENEFITS OF DOMESTIC AND CROSS-BORDER TRADE IN LIVESTOCK

This chapter examines the costs and benefits that accrue to livestock producers and traders engaged in domestic marketing and cross-border trading activities. It determines what needs to be done to minimize costs and facilitate trade.

6.1 Partial trading budgets

The estimates of costs and benefits were derived using partial trading budgets developed for the domestic and cross-border trading activities. During the first quarter of 2001, detailed data were collected from traders on prices of animals at points of origin, modes of transportation, handling charges and other costs at points of purchase, transactions costs at frontier markets, prices of animals at the frontier markets, official and illicit taxes along the trading routes and prices of animals at the terminal markets. These data enabled the estimation of domestic and export traders' margins in the three study sites.

6.1.1 Transportation and handling costs

There were two main modes of transportation used by livestock producers and traders, namely, trekking and trucking. Farmers trekked their animals from the farm gate to the point of sale. For animals purchased at collection markets, trekking was the dominant means of transportation to frontier markets. Usually, animals in groups ranging from 10 - 100 were driven on the hoof by herders accompanied by traders' agents. Both herders and agents were paid fees per head of animal or per day. Where cost per head was available it was used in our calculations, otherwise the total cost of transportation was divided by the number of animals per trip. To obtain cost of trucking per head of animal, the total cost of trucking was divided by the number of animals transported, usually 32-35 in the case of cattle depending on the size of the animals. Loading and off-loading were included as handling charges. Since the dominant mode of transportation from the farm gate to the frontier market was trekking, it was used in calculating transportation costs from Niena to Sikasso, Tenkodogo to Bittou and Djefoula to Niangoloko in order to maintain the same standard in all cases.

6.1.2 Transactions costs

In contrast to physical marketing costs (e.g. cost of transportation, cost of capital invested, traders' cost of living during trips etc.), transactions costs include fees paid to intermediaries, agents' and market associations for entry and exit of animals into markets. Outside the markets, transactions costs include administrative charges as well as official and illicit taxes. At the domestic level, due to the absences of customs posts, transactions costs were incurred only at the points of purchase and resale, while for the cross-border segment there were, in addition, the official and illegal charges paid along the trade routes. All the above-mentioned costs are itemised in the partial budgets to show their relative contributions to total marketing cost.

6.2 Costs and benefits of livestock trade: the domestic segment

Table 6.1 shows that, on average, an animal purchased at Niena by a domestic trader at the cost of 95,000 CFA was resold for 107,300 CFA at the Sikasso frontier market to export traders who finally obtained 144,472 CFA for the animal at the terminal market in Port Bouet, Abidjan, Côte d'Ivoire. The livestock producer received about 66% of the final market price in the Niena-Sikasso-Port Bouet corridor, 70% in the Tenkodogo-Bittou-Accra corridor and 65% in the Djefoula-Niangoloko-Port Bouet corridor. The proportional share of the final price received by the producers in all 3 study sites appeared to be similar.

Table 6.1: Costs and returns to domestic marketing of cattle: partial budgets based on trade originating from Niena to Sikasso (Mali), Tenkodogo to Bittou (Burkina Faso), and Djefoula to Niangoloko (Burkina Faso), January – March 2001.

COST ITEM	DESCRIPTION	SIKASSO		BITTOU		NIANGOLOKO	
		Niéna to Sikasso (FCFA /head)	% of terminal market price	Tenkodogo to Bittou (FCFA /head)	% of terminal market price	Djefoula to Niangoloko (FCFA /head)	% of terminal market price
1	Price of cattle at origin	95000	65.8	95500	69.6	80400	64.5
2	Transportation & handling	1000	0.7	500	0.4	1750	1.4
3	Transaction costs at origin	800	0.6	900	0.7	1450	1.2
3a	Purchase tax/entry fees	150		150		500	
3b	Intermediary fees	500		500		500	
3c	Market association fees	150		150		0	
3d	Communal tax	0		0		300	
3e	Market herders' fees	0		50		0	
3f	Exit fees	0		50		150	
4	Transaction costs at frontier market	850	0.6	700	0.5	350	0.3
4a	Entry fees	150		100		150	
4b	Market herders' fees	200		0		200	
4c	Agent fees	500		500		0	
4d	Communal tax	0		100		0	
5	Trader's cost of living	500	0.3	500	0.4	500	0.4
6	Cost of capital	1250	0.9	835	0.6	1250	1.0
7	Marketing margin	7900	5.5	3765	2.7	4500	3.6
8	Price of cattle at frontier market	107300	74.3	102700	74.9	90200	72.3
9	Price of cattle at the terminal market	144472	100.0	137163	100.0	124709	100.0

The marketing margins for domestic livestock traders ranged from 2.7% of the final price of the animal for the Tenkodogo-Bittou –Accra case to 5.5% for Niena-Sikasso-Port Bouet case (Table 6.1). This range of profit is not considered excessive for the services rendered by the traders. From this, it can be deduced that the domestic markets function reasonably well, although efforts to improve market structure and performance should focus on reducing transactions costs and improving the flow of livestock market information to all market participants, particularly livestock producers.

6.3 Costs and benefits of livestock trade: the cross-border component

The cross-border component of the livestock marketing channel is taken to start from the time the purchase of animals takes place at the frontier markets to the time of resale at the terminal markets. For the analysis of cross-border trade, costs and benefits have been broken down into 10 constituent parts namely: price of cattle at frontier market; transportation and handling cost; transactions cost at frontier market; official duties, fees and taxes; transactions cost at the terminal market, bribes and extortion along the trade

routes, trader's living expenses, cost of capital, export trader's margin and price of cattle at terminal market (Table 6.2).

Table 6.2: Costs and returns to cross-border trade in cattle: partial budgets based on trade originating from Niena to Sikasso to Port Bouet; Tenkodogo to Bittou to Accra; and Djefoula to Niangoloko to Port Bouet, Abidjan, January – March 2001.

COST ITEM	DESCRIPTION	SIKASSO		BITTOU		NIANGOLOKO	
		Sikasso to Port Bouet,	% of final price	Bittou to Accra, Ghana	% of final price	Niangoloko to Port Bouet,	% of final price
1	**Price of cattle at frontier market**	**107300**	**74.3**	**102700**	**74.9**	**90200**	**72.3**
2	Transportation and handling	8412	5.8	9428	6.9	8428	6.8
3	Transaction costs at frontier market	1350	0.9	1600	1.2	1900	1.5
4	Official costs, duties and taxes	3686	2.6	5643	4.1	8221	6.6
5	Transaction costs at terminal market	1271	0.9	486	0.4	1257	1.0
6	Bribes and extortion	2029	1.4	343	0.3	1586	1.3
7	Trader's living expenses	170	0.1	200	0.1	172	0.1
8	Cost of capital	2357	1.6	2006	1.5	1862	1.5
9	Export trader's margin	17897	12.4	14757	10.8	11083	8.9
10	**Price of cattle at terminal market**	**144472**	**100.0**	**137163**	**100.0**	**124709**	**100.0**

Transportation and handling charges account for between 5.8% and 6.9% of the final price of cattle sold at the various terminal markets. Moving cattle from the frontier market to the terminal market has associated transactions costs, including official duties and taxes as well as illicit taxes. When transportation and handling cost is added to these en route transactions costs, these cost items constitute 11.6%, 17.2% and 12.9% of the final cost of an animal along the Sikasso-Port Bouet, Niangoloko-Port Bouet and Bittou-Accra corridors, respectively. These values are high and it would appear that a reduction in transportation and handling and associated transactions costs would lower the final market price of an animal, with benefits to both consumers and producers.

Export traders' margins ranged from 8.9% in the Niangoloko-Port Bouet corridor to 12.4% in the Sikasso-Port Bouet corridor, which is more than double the margins made by traders operating in the domestic segment. This increase partly reflects the returns to the higher risk borne by export traders.

6.4 Decomposition of cross-border trade costs

The total costs of cross-border trade along each of the 3 trade channels were decomposed into 5 constituent parts as shown in Figure 6.1. Transportation and handling turned out to be the single highest cost item accounting for 44%, 48% and 36% of the total cost along the Sikasso, Bittou and Niangoloko corridors, respectively, followed by official taxes and duties. In Box 6.1 a detailed and verified account of the official duties and taxes for a typical trip between Sikasso and Port Bouet is summarised.

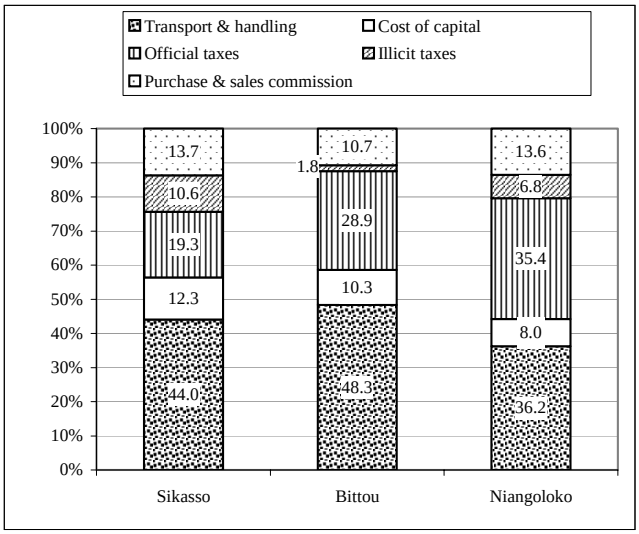

Figure 6.1: Decomposition of costs of cross border cattle trade from Sikasso (Mali) to Abidjan (Côte d'Ivoire), Niangoloko (Burkina Faso) to Abidjan (Côte d'Ivoire) and Bittou (Burkina Faso) to Accra (Ghana).

In addition, illicit taxes varied from about 2% of the total cost of cross-border trade along the Bittou-Accra corridor to about 11% along the Sikasso-Port Bouet corridor. The Ghanaian government has made a great effort to reduce extortion along the trade routes in that country. Purchase and sales commissions ranged from 11% for Bittou-Accra corridor to 14% for the two other cases.

6.5 Summary

These results demonstrate the constraints that high transportation and transactions costs pose to intra-regional trade and corroborates the findings of Yade et al. (1998) which showed that it costs about US$ 230 per tonne of beef equivalent to move cattle from the Sahel to the coast of West Africa compared with only US$ 80 per tonne of beef shipped in from Europe. These findings also give an indication of the opportunities that exist for policy intervention to reduce transportation and transactions costs in order to improve the volume and value of intra-regional livestock trade in West Africa.

Box 6.1: A verified traders' account of formalities involved in cross-border cattle trade between Sikasso, Mali and Port Bouet, Abidjan, Côte d'Ivoire

Trading licence

No longer required

Other personal documents

- **Carte Consulaire**: Obtainable from the Malian embassy in CI @ 10,000 CFA. Valid for 3 years.
- **Carte de Séjour**: Obtainable from the Ivorian police @ 17,500 CFA. Valid for 1 year.
- **Carte de vaccination**

Border formalities (in Mali)

- **Certificat provisoire d'exportation de bétail**. This is obtained from the office of SLACAER (Service Local de l'Appui Counseil de l'Amenagement et de l'Equipement Rural) in Sikasso at a cost of 500-1,500 CFA and is required at the customs post. To obtain this, the following 2 certificates costing 1,000 CFA are required:
  - **Certificat de vaccination** to certify that the animals have been vaccinated
  - **Certificat sanitaire d'exportation**. This is handed out by agents of SLACAER to certify that visual inspection of animals by the veterinary service has been done.

- **Lettre de Voiture Inter-Etats** (Inter-States Waybill). Obtained at DNT (Direction Nationale des Transports) in Sikasso at the cost of 2,500 CFA.

- **EMACI.** Certain traders mentioned this formality for which they pay 1,500 CFA at Zegoua – a control post in Mali but none was able to specify what it was for.

- **Douane.** Although official duties have been abolished in Mali, traders systematically pay 5,000 CFA per truck at 'douane' stops in both Sikasso and Zegoua.

Formalities in Côte d'Ivoire

Douanes. Official Ivorian customs duties are paid in Pogo (with receipt) and depend on the number of animals in a truck but range from 27,500-35,000 CFA per truck.

Convoyage. This fee has more than doubled from 35,000 CFA in 2000 to 80,000 CFA in Jaunary 2001. Sikasso traders pay this fee in Pogo.

Laisser Passer Veterinaire. 250 CFA/cattle or 15,000 CFA/truck of cattle paid to Ministere de l'Agriculture et des Ressources Animales, Direction Regionales du Nord, Poste d'entrée de Nielle.

7 HARMONIZATION OF LIVESTOCK TRADE POLICIES AMONG PARTICIPATING COUNTRIES

Although there are similarities in the livestock sector policies of the countries included in this project, there are also important variations. Such variations arise partly because livestock sector objectives differ across countries and partly because some of the countries are livestock exporters, while others are importers. Nonetheless, to promote expansion of intra-regional trade in livestock, trade-related policies need to be streamlined and co-ordinated to cut down on administrative impediments and to ensure that policies are mutually reinforcing, rather than antagonistic.

In this chapter, a synopsis of policy reforms that have been undertaken in the study countries to improve livestock production, marketing and cross-border trade are presented and discussed in terms of what remains to be done in streamlining and aligning national policies to promote growth in the livestock sector and regional trade. But before presenting the synopsis, a conceptual framework for policy harmonization is first developed and described.

7.1 Conceptual framework for policy harmonization

It is well known that policy making is by no means the rational activity that it is often held up to be in everyday discussion. Indeed, policy making is "actually rather messy, with outcomes occurring as a result of complicated political, social and institutional processes which are at best described as evolutionary" (Juma and Clarke, 1995). As a result, changes in policy rarely result from a linear progression from research findings to successful policy implementation but rather changes come about through a process of iterative, long-term, flexible and multifaceted interactions, with information sharing and stakeholders' consultation to build a political consensus to sustain the change. This complexity suggests that developing a conceptual framework to highlight the various intermediate steps involved in policy making can assist in identifying ways through which research findings can be shared with relevant stakeholders (policy makers, professional groups in livestock trade etc) for use in policy formulation. With specific reference to this study, the aim is to find ways to channel our research findings on emerging opportunities and policy constraints to livestock marketing and cross-border trade to policy makers so that they can use this information in developing 'new' mutually reinforcing policies that would eliminate or reduce barriers and promote intra-regional livestock trade.

Figure 7.1 shows a conceptual interactive framework for livestock trade policy harmonization in the study countries. It starts from the premise that barriers to intra-regional trade could be policy or non-policy induced and these barriers may affect trade directly or indirectly. Policy research is central in this framework as research is needed to identify the sources and nature of trade barriers and determine appropriate corrective measures. As expected, new policies will affect different stakeholders in different ways and there will be beneficiaries as well as losers. For example, a reduction of trade taxes in a given country may initially reduce government revenue but will benefit livestock traders, and in a well functioning market with good price transmission, producers and

consumers as well. In a wider context where there are livestock exporting and importing countries, changes in policy in one country could very well result in positive impacts in

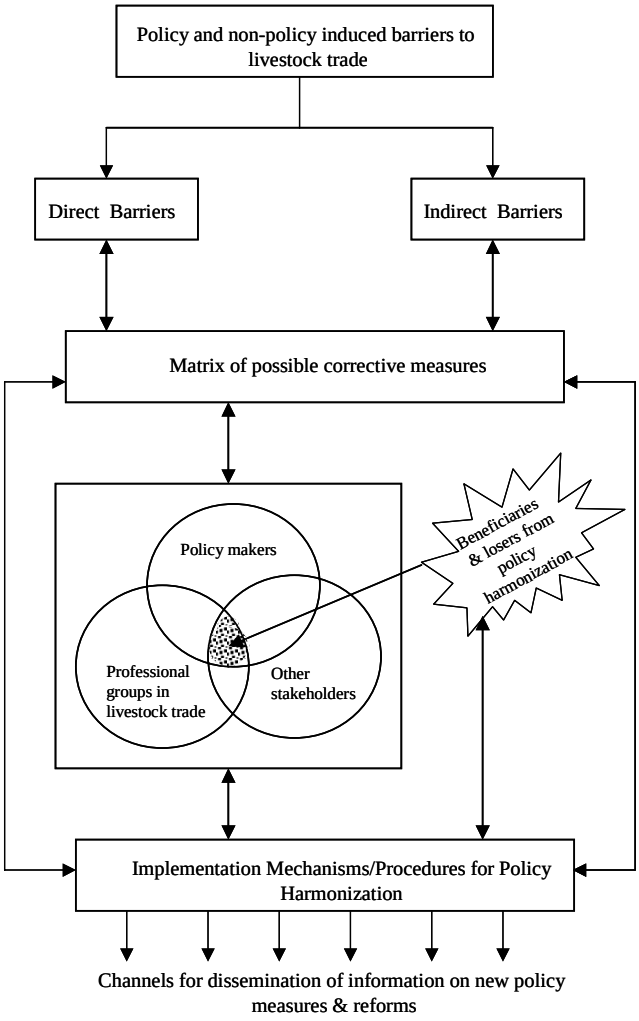

Figure 7.1: An interactive framework for policy harmonization to reduce trade barriers and promote intra-regional livestock trade.

the policy-initiating country and negative impacts in the other country. While stakeholders that expect to benefit from a new policy will support its implementation, losers will resist it. A consensus can be reached to allow the change to go ahead when winners agree to compensate losers for some of their losses. In this situation, there is an iterative and dynamic process of revising the matrix of corrective measures and policy instruments to take cognizance of the impact of policy changes on different interest groups and to cater for their viewpoints in the process of policy formulation. Once a policy is adopted, a critical step in its implementation lies in the dissemination of information about it to the public. Many good policies have faltered due to lack of awareness of the provisions of the policy by the general public. This is particularly true of livestock trade policies in the study countries as evidence gathered in the course of undertaking this study showed that partly due to lack of public awareness programmes and partly as a result of the high degree of illiteracy of livestock traders, many of them

were unaware of the abolition of certain taxes and administrative laws affecting livestock marketing and trade in their own and neighbouring countries. Figure 7.2 shows a flow diagram that was developed early in the life of this project as a means of utilizing channels of communication already established by CILSS to share information on new policies and research findings with different stakeholders in the livestock trade.

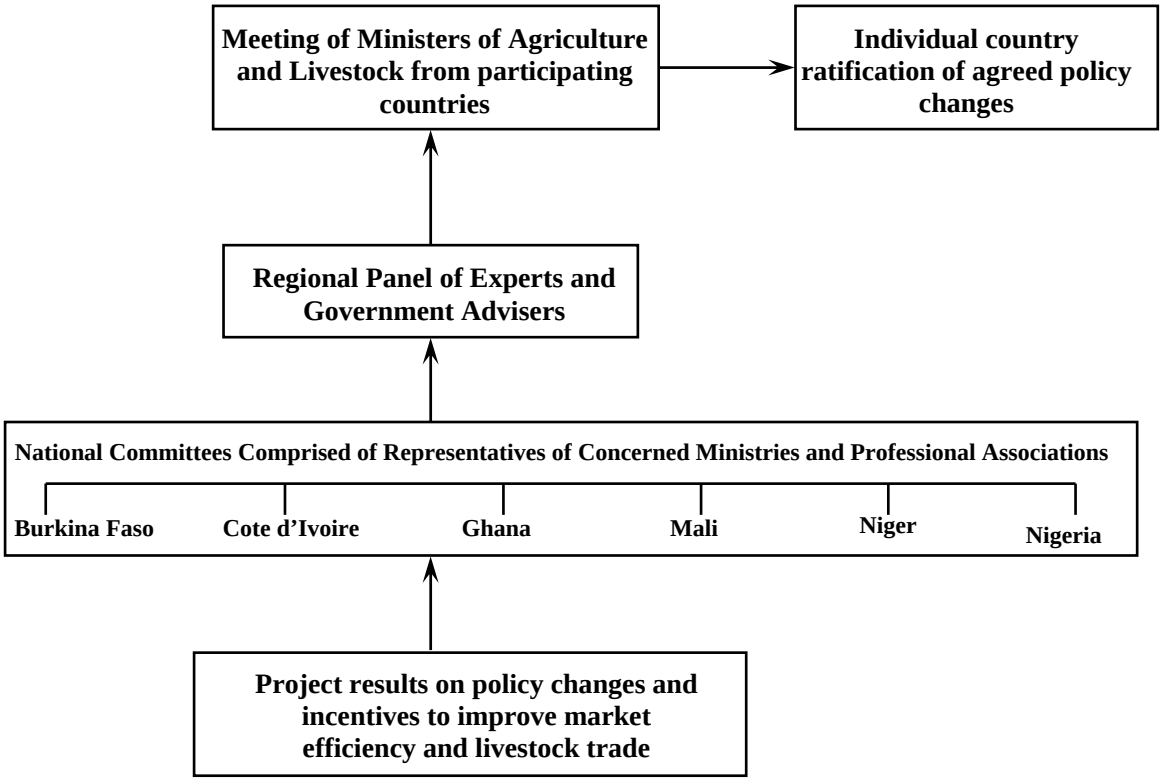

Figure 7.2: Policy information dissemination channels

Having presented the conceptual frameworks for policy harmonization and information dissemination, we now examine the list of barriers to cross-border livestock trade derived from interviews of representatives of livestock traders associations and selected policy advisers from the study countries. For additional information, see also Williams (1999b).

7.2 Policy and non-policy barriers to cross-border trade

The main constraints to cross-border livestock trade that were identified by a cross section of representatives of livestock market associations and policy advisers in the study countries are listed below not in any particular order of importance, but the first four bullet points originated from livestock traders while the remaining constraints were voiced by government policy advisers. The constraints included:

- Excessive road blocks and unlawful tax collection at these road blocks;
- High official taxes (e.g. in Niger and Burkina Faso) and arbitrariness in arriving at the taxation level (e.g. in Côte d'Ivoire);
- Poor state of roads and high cost of transporting animals to markets;
- Inadequate flow of market information – on prices, levels of supply and demand – needed to make informed trade decisions;
- High level of illiteracy among market operators which hinders innovation, awareness and understanding of government policies;
- Lack of formal and binding trade contracts between market operators; and
- The dominant practice of trade in live animals with almost total neglect of value-addition through processing and trade in meat products.

Having listed the major impediments to cross-border livestock trade as seen by some of the actors directly involved in the trade, it is equally pertinent to look at the trade policy reforms that have been undertaken in the study countries from a normative perspective and consider what remains to be done in terms of aligning trade policies across the study countries to promote regional livestock sector growth.

7.3 Policy reforms affecting intra-regional livestock trade

Trade policy reforms that have been undertaken in the study countries can be discussed under 4 rubrics viz: trade liberalization, trade facilitation, exchange and payments systems and investment facilitation. Theoretically, the range of measures that can be implemented under each rubric if complete reform is feasible includes:

- **Trade liberalization**
  - tariff structure simplification
  - tariff reduction
  - elimination of tariffs on intra-regional trade
  - removal of non-tariff barriers
  - reduction of other duties and charges (ODC)
- **Trade facilitation**
  - single customs declaration form
  - common road transit document
  - harmonized transit charges
  - bond guarantee scheme
- **Exchange and payments system**
  - domestic payments and settlement schemes
  - development of inter-bank foreign exchange markets

- relaxation of restrictions on capital flows
- insurance schemes for financial and commercial risks
-

- **Investment facilitation**
  - adoption of a single and simple investment code
  - one-stop investment approval authority
  - statute of limitations.

In reality, the extent and pace of reforms in the study countries have differed. Table 7.1 shows what has been achieved in each country in terms of trade liberalization. Much progress has been made in tariff simplification and reduction and this has facilitated the flow of regional trade in livestock, particularly exports from Mali. On the other hand, non-tariff barriers, other duties and charges and illicit taxes continue to pose formidable constraints to regional trade. These constraints reduce incentives and lower the returns to market participants.

Table 7.1: Progress towards trade liberalization in the study countries

Measure	Country					
	Burkina Faso	**Côte d'Ivoire**	**Mali**	**Niger**	**Ghana**	**Nigeria**
Tariff structure simplification	+	+	+	+	+	-
Tariff reduction	+	+	+	-	+	+
Elimination of tariffs on intra-regional trade	-	-	-	-	-	-
Elimination of non-tariff barriers (NTB)	-	-	-	-	-	-
Reduction of other duties and charges (ODC)	-	+	+	+	-	-
Elimination of illicit taxes	-	-	-	-	-	-

Note: + = Plus, implying positive progress
- = Negative, implying not much has been done

In terms of trade facilitation, particularly in the area of single customs declaration form and road transit document, Mali and Ghana have made significant improvements. In Mali, for example, there has been in existence for some years now a one-stop window for the regularisation of customs paper and transport document. In Ghana, there has also been a simplification of the customs declaration procedures.

In the area of exchange and payments systems and investment facilitation formidable obstacles still exist and governments in the study countries individually and collectively still have a lot to do to improve the economic environment for intra-regional livestock trade. Part of the problem here lies in the different currencies used in the different parts of the region and the problem of inter-convertibility of these currencies. The transhumance nature of extensive livestock production and trade in live animals coupled with the problem of moral hazard make formal credit and insurance schemes unavailable to

livestock producers and traders in the region as financial institutions consider the risks involved in livestock production and trade too high to bear. These constraints and the barriers earlier mentioned are the major impediments that policy makers need to eliminate to improve economic benefits and growth of regional livestock trade.

7.4 Options for harmonization of trade policies to enhance intra-regional livestock trade

In terms of harmonizing national policies across study countries to promote intra-regional trade, the foregoing discussion has shown that there are opportunities for realignment of policies in the areas of trade liberalization, facilitation and exchange and payment systems. In theory, there are established institutions and mechanisms for operationalizing action on these issues. Once such institution is UEMOA to which four (Burkina Faso, Côte d'Ivoire, Mali and Niger) out of the six countries covered in this study belong. UEMOA established on August 1, 1994, partly as reaction to the devaluation of the FCFA, has amongst its objectives:

- to create a common market for the member states based on the free flow of people, goods, services and capital, the right of individuals to set up businesses within the area, a common external customs tariff and a common trade policy;

- to promote the coordination of national sectoral policy and implementation in the areas of agriculture, environment, transport, infrastructure, telecommunications, human resources, energy, industry, mining and crafts; and

- where necessary for the smooth operation of the common market, to harmonize legislation across member states, particularly the fiscal system.

In reality, progress in implementation has lagged behind stated objectives. Nonetheless, UEMOA members in early 2000 adopted a customs union and common external tariff and have harmonized indirect taxation regulations (e.g. value added tax, VAT). This process which has focussed so far on macroeconomic convergence needs to be extended to sectoral and trade policies influencing intra-regional, including livestock trade. In this context, elimination of tariffs on cross-border livestock trade is feasible and should be pursued urgently given the importance of livestock in intra-regional trade. In the same vein, legislation should be tightened to eliminate illicit taxation.

Given that there are six additional countries (apart from the 8 member states in UEMOA) in the larger ECOWAS grouping, two of which are covered in this study, i.e. Ghana and Nigeria, where the UEMOA harmonization guidelines do not extend, efforts need to be made using the communication channels already established by CILSS to extend the progress that has been achieved in UEMOA to these other countries in order to promote regional livestock trade. Mobilizing the political will to move forward the policy harmonization agenda in the region is a challenge which governments in the region will have to address.

7.5 Summary

This chapter has sketched out a framework that can provide guidance in the process of implementing policy changes to promote intra-regional livestock trade. A review of policy reforms undertaken in the study countries and options for policy harmonization showed that:

i. Tariffs have been reduced in most of the study countries and similar progress has been made towards tariff structure simplification;

ii. The elimination of non-tariff barriers (NTB) and illicit taxation have been particularly problematic with no country achieving any significant measure of success with the probable exception of Ghana;

iii. The pace of progress towards trade liberalisation has been particularly uneven in the case of the reduction of other duties and charges (ODC). While Côte d'Ivoire, Ghana, Mali and Niger have implemented reduction measures, not much has been achieved in the cases of Burkina Faso and Nigeria; and

iv. Harmonisation of livestock trade policies within the study countries will need to build on the progress that has been made in UEMOA member states on macroeconomic convergence, adoption of a customs union and streamlined indirect taxation procedures. At a regional level, this call for strong political will on the part of governments in the larger ECOWAS grouping to extend what has been achieved in the UEMOA group to the entire 14 member countries in the regional economic community.

8 SUMMARY, CONCLUSIONS AND IMPLICATIONS FOR POLICY AND FURTHER RESEARCH

8.1 Summary

This study has analysed the economic, institutional and policy constraints to domestic livestock marketing and cross-border trade in six West African countries in order to provide a context within which policy reforms can be instituted to improve market efficiency and the welfare of those who depend on the livestock sector for their livelihoods. The main findings of the study can be summarized under four main headings viz: i) livestock market operations, ii) livestock pricing, iii) costs and returns to livestock marketing and trade, and iv) livestock trade policy reforms in participating countries.

8.1.1 Market operations

i. Livestock marketing channels in the study countries can be partitioned into domestic and cross-border segments. Private entrepreneurs operating through a marketing chain involving collection, regrouping and terminal markets carry out the trade in live animals. While all traders (small-, medium- and large-scale) participated in the domestic segment of the marketing chain, only large-scale traders were involved in the export segment reflecting the huge initial capital investment involved in the export trade. Inadequate own-capital and limited access to credit effectively serve as market entry barriers to small traders who would like to get involved in cross-border livestock trade.

ii. Although the marketing channels were found to be relatively unsophisticated there were a number of constraints to efficient functioning of markets arising from cumbersome formalities, exorbitant fees and taxes (both legal and illegal) collected along the trade routes, lack of well-marked out cattle corridors for trekking animals to frontier markets, occasional shortage of trucks for moving animals to terminal markets, a system of selling on credit, particularly to butchers, lack of market information and limited own-capital and access to formal credit sources. These constraints increase actual market and transactions costs and sometimes prevent market exchange from taking place.

iii. Local-level market associations (e.g. COBAS in Mali) and other institutions at the national level (e.g. UNACEB in Burkina Faso) have emerged in recent years to facilitate livestock trade and lower marketing costs.

8.1.2 Livestock pricing

iv. Buyers were wiling to pay a premium for heavily built, castrated zebu cattle in excellent body condition. However, smallholder producers are not yet taking advantage of this opportunity as only about 10% of the cattle traded were rated as being in excellent body condition even though the results showed that efforts to finish animals properly and present them in good condition would be adequately compensated.

v. Analysis showed that export traders offered a higher price for the same type of animal than itinerant traders and collectors indicating that their animals, producers would benefit more if they deal directly with export traders.

vi. Two distinctly marked periods of sale of animals were observed: i) October – March, the off-peak period and ii) April to September, the peak period. It was observed that more animals were available for sale and prices offered for them were higher during the peak sales period than in the off-peak period.

vii. The seasonal variation in livestock flows and prices affected traders' profits. It appeared that traders made higher profits in the peak period than in the off-peak season. This is one occasion when both livestock producers and traders benefited by doing business during the peak sales period.

8.1.3 Costs and benefits of livestock trade

vii. Cross-border transportation and handling costs accounted for between 5.8% and 6.9% of the final price of cattle sold in Abidjan and Accra.

ix. Official duties and taxes were high, particularly along the Burkina Faso-Côte d'Ivoire corridor (6.6% of final cost of animal), compared with 2.6% of the final price of animals along the Mali- Côte d'Ivoire corridor and 4.1% of the final price of animal along the Burkina Faso-Ghana corridor.

x. Cross-border traders' margins ranged from 8.9% of the final price of animal along the Djefoula-Niangoloko-Port Bouet corridor to 12.4% of the final price of animal along the Niena-Sikasso-Port Bouet corridor. These margins were more than double the margins made by traders operating in the domestic segment of the marketing chain.

xi. When the overall cost of cross-border trade (including transportation and handling, official duties and illicit taxes etc) was decomposed, it was found that transportation and handling was the single highest cost item accounting for 44%, 48% and 36% of the total cost in Sikasso, Bittou and Niangoloko, respectively, while transactions costs (made up of purchase and sales commission, official duties and taxes and illicit fees) accounted for 44%, 41% and 56% of the total cost in Sikasso, Bittou and Niangoloko, respectively. It is thus clear that transportation and transactions costs constitute major constraints to cross-border livestock trade.

8.1.4 Livestock trade policy reforms in participating countries

xi. Tariffs have been reduced in most of the study countries and similar progress has been made towards tariff structure simplification;

xiii. The elimination of non-tariff barriers (NTB) and illicit taxation have been particularly problematic with no country achieving any significant measure of success with the probable exception of Ghana;

xiv. The pace of progress towards trade liberalisation has been particularly uneven in the case of the reduction of other duties and charges (ODC). While Côte d'Ivoire, Ghana, Mali and Niger have implemented reduction measures, not much has been achieved in the cases of Burkina Faso and Nigeria; and

xv. Harmonisation of livestock trade policies within the study countries will need to build on the progress that has been made in UEMOA member states on macroeconomic convergence, adoption of a customs union and streamlined indirect taxation procedures.

8.2 Conclusions

From these findings, the following major conclusions were drawn:

i. The large number of producers, intermediaries, buyers and traders in the domestic segment of the livestock marketing channel create a near 'perfect' market condition that allows this segment to function reasonably well.

ii. Livestock producers in the study countries could increase their earnings by marketing animals that are in good body condition rather than the present practice of selling all grades of animals. Devoting attention to properly finishing the animals before presenting them for sale (e.g. through fattening) could increase the returns to producers.

iii. Cross-border livestock trade is constrained by high transportation and handling costs, high direct, indirect and illicit taxes, and lack of market information. In addition, performance could be improved through the provision of credit facilities to enable aspiring traders overcome market-entry limitations posed by lack of own-capital and thus increase the number of traders and volume of trade.

iv. Progress has been made in policy reforms aimed at liberalising livestock trade in the participating countries but the pace has been uneven and this continues to hamper intra-regional trade.

8.3 Implications for policy and research

The findings and conclusions of this study suggest 3 major policy thrusts namely: i) facilitating access to credit for livestock trade; ii) empowering livestock producers through provision of information on market prices, buyers' preferences, supply and demand of animals in major markets etc; and iii) lowering marketing costs.

8.3.1 Facilitating access to credit

Livestock trade is capital intensive for poor entrepreneurs. This explains why an overwhelming majority of traders interviewed in the various locations listed inadequate own-capital and difficult access to credit as the most limiting constraint to livestock trade and an important reason for joining market associations. The market associations have, in

response to the needs of their members, been involved in obtaining and on-lending credit at interest rates varying between 8% and 12% on top of the banks lending rates but they have been able to meet only a small fraction of the requests. Nonetheless, by running such schemes successfully and still remaining in business, these market associations have demonstrated their competence and efforts should be made to utilize these channels to provide credit assistance to traders and producers in the future. This is particularly important since small-scale traders and producers on their own cannot satisfy the guarantee conditions usually stipulated by formal lending institutions. Innovative and less formal credit schemes that suit the production and trading situations of small-scale entrepreneurs, along the lines of the Grameen Bank in Asia, should also be explored

8.3.2 Empowering livestock producers

Provision of information on consumer preferences, demand and supply of animals, market prices, government policies governing cross-border trade etc can allow producers and traders to improve their earnings from livestock sales. This study has shown the preference of export traders for castrated, heavily built zebu cattle in excellent body condition but this information has apparently not filtered down sufficiently as there was no preponderance of castrated cattle in any of the markets to reflect this preference neither was there evidence of conscientious, extra effort on the part of the producers to ensure that the animals offered for sale were in excellent body condition. Similarly, many traders were unaware of new policies that have abolished certain levies and duties and this created room for unscrupulous border officials to exploit them.

These situations point to the importance of creating the necessary level of awareness, for instance, among livestock producers about buyers' preferences at the same time that market information is being relayed to them. Also improving general public awareness of government policies will be useful to reduce ignorance of new policy provisions. Opportunities for experimentation and creative application of ICTs should be explored to promote improved information exchange among market participants – producers, traders and policy makers. A range of ICTs, including community radios, audio-visuals, Internet, mobile telephones etc., should be used to ensure that even the most marginalized groups can find a way to improve their access to the kind of information that is relevant to their livelihoods and that can empower them. Nonetheless, it goes without saying that the information being disseminated must be of good quality and timely in order to be of any use. Therefore, the network for data collection, collation, analysis and broadcasting that is under Component 1 of this project needs to be made sustainable over the long-term.

8.3.3 Lowering marketing costs

As shown earlier in this study, the system of livestock marketing and trade in the study countries is still highly personalised. A personalised marketing system has high transactions costs. In addition, there are physical marketing costs, e.g. transportation and handling costs and various official and illicit taxes that increase the overall cost of cross-border trade. Lowering these costs through the gradual institution of objective standards of pricing, formalised contracts and policy reforms would go a long way to improve the

volume and value of intra-regional livestock trade and the welfare of those who depend on the livestock sector for their livelihoods.

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APPENDIX I

More Tables and Figures related to the report

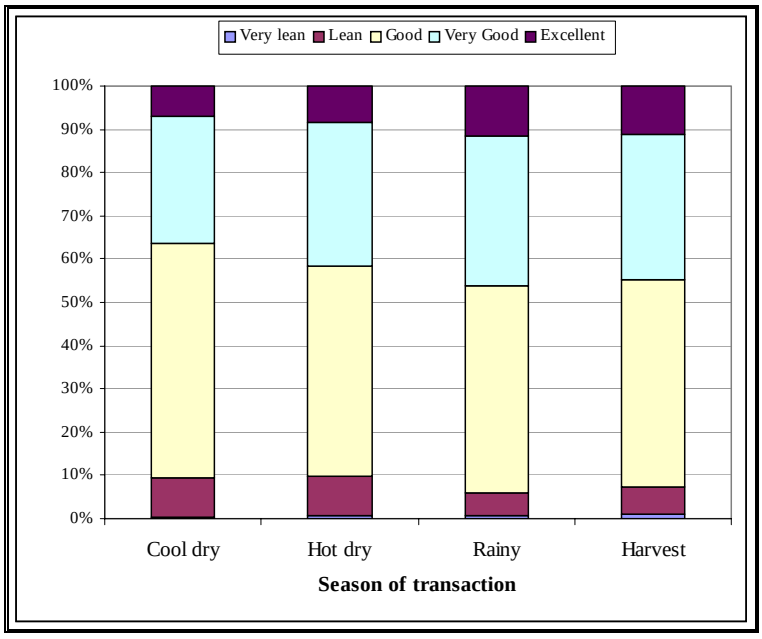

Figure A5.1: **The body condition rating of cattle traded or transiting through the Sikasso (Mali), Bittou and Niangoloko (Burkina Faso) frontier markets during the 4 livestock sales seasons.**

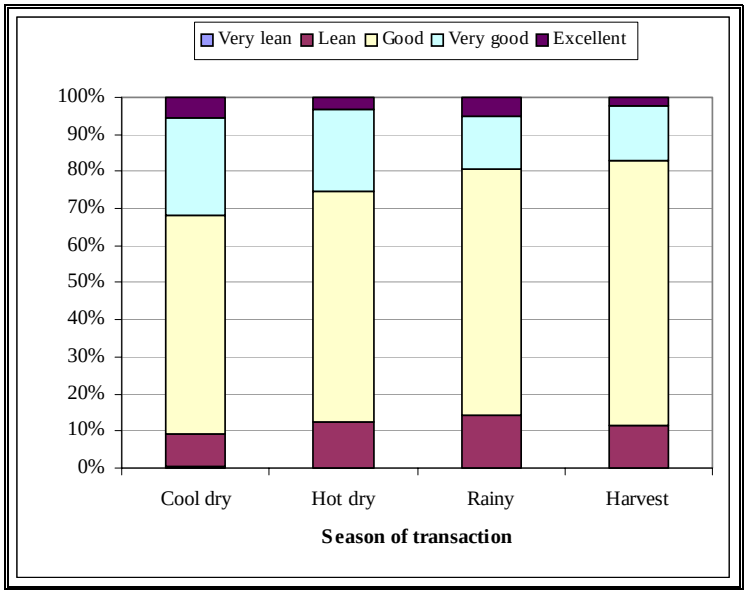

Figure A5.2: **The body condition rating of sheep and goats traded or transiting through the Bittou (Burkina Faso) frontier market during the 4 livestock sales seasons.**

Table A5.1: Estimated coefficients (× 100) and t-ratios of multiple- and single-season analysis of covariance (AnCov) models used to estimate *ln*(frontier market price) of export cattle at Sikasso livestock markets according to season of sale (January 2000 – June 2001).

Parameters	Season of sale				
	All seasons	Cool dry	Hot dry	Rainy	Harvest
Intercept	1124.6****	1167.8****	1144.9****	1149.0****	1135.7****
Biological characteristics					
Age	8.86****	0.69	14.6****	7.42****	10.5*****
Age^2	-0.48****	0.05	-0.86****	-0.34	-0.05****
Sex of animal					
Female	-34.7****	-34.5****	-26.3****	-37.7****	-35.0****
Male	6.75****	5.45****	8.94****	5.66****	7.84****
Castrate	0.00	0.00	0.00	0.00	0.00
Condition score					
Very lean	na				
Lean	-74.2****	-61.3****	-79.6****	-84.9****	-89.7****
Good	-41.0****	-44.9****	-48.5****	-39.1****	-37.4****
Very good	-16.5****	-20.3	-18.1****	-14.5****	-17.4****
Excellent	0.00	0.00	0.00	0.00	0.00
Breed of animal					
Local	8.76****	9.23***	8.9****	10.0****	5.25****
Zebu	0.00	0.00	0.00	0.00	0.00
Dominant colour of animal					
White	-0.49	7.57	-1.58	0.20	-1.52
Brown	-7.67****	0.16	-13.9***	-4.85	-14.6**
Fauve	-2.15**	-0.34	-8.19***	-1.55	0.68
Grey	-0.81	-0.67	-5.766E-02	1.36	-0.03
Black	0.16	1.15	-7.078E-03	1.71	-1.98
Red	0.00	0.00	0.00	0.00	0.00
Marketing factors					
Type of seller					
Farmer	18.0****	18.6****	-9.78****	-0.20	-1.93
Trader	21.2****	27.7****	-8.46****	-0.45	0.08
Breeder	20.3****	17.0****	0.00	0.40	0.00
Others	0.00	0.00	na	0.00	na
Season of sale					
Cool dry	4.59****	na	na	na	na
Hot dry	8.99****	na	na	na	na
Rainy	4.22****	na	na	na	na
Harvest	0.00	na	na	na	na
Sample size	5028	1244	935	1794	1055
R-squared	0.69	0.78	0.59	0.69	0.70

Table A5.2: Estimated coefficients (× 100) and t-ratios of multiple- and single-season analysis of covariance (AnCov) models used to estimate *ln*(frontier market price) of export cattle at Niangoloko (Burkina Faso) livestock markets according to season of sale (January 2000 – June 2001).

Parameters	Season of sale				
	All seasons	Cool dry	Hot dry	Rainy	Harvest
Intercept	996.2***	916.2****	955.2****	1010.9****	955.6****
Biological characteristics					
Age	0.13	-3.90*	-2.47	2.96	4.71***
Age^2	-0.05	0.15	0.01	-0.22	-0.30***
Weight	0.87****	1.21****	1.0****	0.68****	0.91****
$Weight^2$	-0.00008****	-0.0001***	-0.00008****	-0.00006****	-0.00009****
Sex of animal					
Female	-10.1****	-10.0**	-4.27*	-14.3***	-13.2****
Male	-0.28	-1.32	1.29	-0.95	-2.55
Castrate	0.00	0.00	0.00	0.00	0.00
Condition score					
Very lean	na	na	na	na	na
Lean	-22.0****	-22.7**	-16.3****	-16.1****	na
Good	-10.7****	-9.42	-8.29***	-10.3****	-8.36**
Very good	-7.46****	-5.43	-6.25***	-6.95****	-7.25****
Excellent	0.00	0.00	0.00	0.00	0.00
Breed of animal					
Dgog	0.94	-0.42	7.20***	1.91	0.26
Mery	-3.41***	-9.24**	5.30**	-1.39	-3.80
Meti	0.00	0.00	0.00	0.00	0.00
Dominant colour of animal					
White	0.221	6.51	0.03	0.67	-2.82
Brown	0.25	-0.77	0.004	2.30	-2.94
Fauve	-0.61	4.00	0.08	-1.08	-3.25
Grey	-0.65	4.05	-1.34	0.64	-4.37*
Black	0.28	4.76	1.18	-0.42	-1.83
Red	0.00	0.00	0.00	0.00	0.00
Marketing factors					
Type of seller					
Farmer	-26.2****	-5.66	-0.08	-3.65	1.82
Other	-26.2****	na	19.4****	na	na
Trader	-25.2****	1.71	-3.74	na	na
Breeder	0.00	0.00	0.00	0.00	0.00
Season of sale					
Cool dry	-3.45***	na	na	na	na
Hot dry	14.3****	na	na	na	na
Rainy	14.4****	na	na	na	na
Harvest	0.00	na	na	na	na
Sample size	1136	119	384	348	285
R-squared	0.89	0.92	0.88	0.91	0.90

Table A5.3: Estimated coefficients (× 100) and t-ratios of multiple- and single-season analysis of covariance (AnCov) models used to estimate *ln*(frontier market price) of export cattle at Bittou (Burkina Faso) livestock markets according to season of sale (January 2000 – June 2001).

Parameters	Season of sale				
	All seasons	Cool dry	Hot dry	Rainy	Harvest
Intercept	1125.1****	1143.9****	1089.7****	1040.1****	1110.8****
Biological characteristics					
Age	17.0****	5.45	22.3****	33.3****	25.7****
Age^2	-1.15****	0.13	-2.05****	-1.96***	-2.14****
Sex of animal					
Female	-15.7***	-1.56	-20.9*	28.4	-22.3***
Male	-9.97*	7.69	-11.5	28.5	-20.0***
Castrate	0.00	0.00	0.00	0.00	0.00
Condition score					
Very lean	-84.6****	-96.4****	-31.5****	-111.9***	-79.5****
Lean	-63.5****	-67.6****	-31.9****	-72.7****	-58.3****
Good	-45.0****	-52.2****	-19.3****	-17.6	-42.7****
Very good	-18.1****	-27.7**	0	-8.03	-5.91
Excellent	0.00	0.00	na	0.00	0.00
Breed of animal					
Local	-7.38	na	na	na	-2.034
Zebu	0.00	0.00	0.00	0.00	0.00
Dominant colour of animal					
White	-3.00	-8.14***	3.04	-4.70	0.21
Brown	0.21	-1.46	3.32	-11.1	1.08
Fauve	na	na	na	na	na
Grey	-3.13	-9.94**	2.76	-26.4**	3.33
Black	-0.94	-5.34	1.87	-.129	3.37
Red	0.00	0.00	0.00	0.00	0.00
Marketing factors					
Type of seller					
Farmer	-1.17	6.29	-0.43	1.70	-2.09
Trader	13.5****	17.6****	25.7****	7.80	8.65***
Breeder	0.00	0.00	0.00	0.00	0.00
Others	na	na	na	na	na
Season of sale					
Cool dry	3.27**	na	na	na	na
Hot dry	7.31****	na	na	na	na
Rainy	17.1****	na	na	na	na
Harvest	0.00	na	na	na	na
Sample size	988	347	239	94	318
R-squared	0.66	0.66	0.72	0.72	0.69

Table A5.4: Estimated coefficients (× 100) and t-ratios of multiple- and single-species analysis of covariance (AnCov) models used to estimate *ln*(frontier market price) of export sheep and goats at Bittou (Burkina Faso) livestock markets according to season of sale (January 2000 – June 2001).

Parameters	Livestock Type		
	Sheep and goats	Sheep	Goats
Intercept	772.0****	805.0****	728.3****
Biological characteristics			
Age	11.8****	13.4****	9.52****
Age^2	-2.04****	-2.44****	-1.43****
Weight	8.72****	4.67****	13.3****
$Weight^2$	-0.09****	-0.01	-0.21****
Sex of animal			
Female	-2.37	5.78*	-3.32*
Male	-0.73	10.8****	-4.52**
Castrate	0	0	0
Condition score			
Lean	-13.9****	-17.1****	-13.4****
Good	-11.1****	-14.2****	-11.8****
Very good	-7.20****	-8.52****	-8.07****
Excellent	0	0	0
Species of animal			
Sheep	-0.32****	na	na
Goats	0.00	na	na
Dominant colour of animal			
White	0.68	2.88*	0.76
Brown	-2.81**	4.42*	-3.07**
Fauve	-0.42	na	-0.19
Grey	-0.62	1.00	-0.48
Black	-1.68*	0.06	-1.21
Red	0	0	0
Marketing factors			
Purpose of purchase			
Slaughtering	7.71	11.1*	5.70
Fattening	5.90	4.11	4.74
Breeding	-3.89	-4.20	-1.83
Export	3.39	6.07	2.75
Local resale	0	0	0
Type of seller			
Farmer	-0.78	-2.34	-0.96
Trader	1.65**	5.50	1.71*
Breeder	0	0	0
Type of buyer			
Farmer	15.3	12.1	25.1*
Trader	8.21*	9.22*	7.99
Breeder	0.60	1.47	na
Butcher	-3.37	-8.00***	1.67
Others	0	0	0
Season of sale			
Cool dry	-4.90****	-7.50****	-2.19
Hot dry	-3.07***	-3.91**	-2.23
Rainy	-3.17**	-3.51*	-2.10
Harvest	0	0	0
Tabaski period			
No	-16.8****	-14.7****	-8.66
Yes	0	0	0
Sample size	2443	1143	1300
R-squared	0.81	0.80	0.84