Baseline survey report on the structure, conduct and performance of pearl millet and sorghum markets in Mali

Mensah, RE, Ndjeunga, J., A Mossi, and MA Zarafi

June 2011

Table of contents

List of tables

List of figures

Summary

Providing improved technologies for increased marketable produce surpluses and proposing market strategies to farmers is viewed as a valuable development intervention. The HOPE project adheres to this framework, and the objective of the present baseline market study is to characterize the existing marketing channels of pearl millet and sorghum grains in Mali and identify the channels which can be arranged innovatively for producers to get better grain prices. The study employs the structure, conduct and performance paradigm for the purposes of describing market actors and marketing channels, and analyzing prices and marketing margins. During the first week of January 2011, 43 market actors were surveyed in 9 major grain markets located in the intervention zone of the HOPE project in Mali.

The results indicated that the major supply sources of pearl millet grains are the individual producers and producer groups, for assemblers and retailers; and assemblers in general and rural assemblers in particular, for wholesalers. Ten channels co-existed for the pearl millet grain marketing: (1) Individual producers and rural assemblers-Assemblers-Exporters; (2) Individual producers and rural assemblers-Assemblers-Wholesalers-Exporters; (3) Individual producers and rural assemblers-Assemblers-Wholesalers-Retailers-Consumers; (4) Individual producers and rural assemblers-Wholesalers-Exporters; (5) Individual producers and rural assemblers-Wholesalers-Retailers-Consumers; (6) Individual producers and rural assemblers-Retailers-Consumers; (7) Producers groups and cooperatives-Assemblers-Exporters; (8) Producers groups and cooperatives-Assemblers-Wholesalers-Exporters; (9) Producers groups and cooperatives-Assemblers-Wholesalers-Retailers-Consumers; and (10) Producers groups and cooperatives-Retailers-Consumers. The highest producer price levels were achieved when large individual suppliers sold to wholesalers (113 F/Kg) or when producers organized collective sales (109-140 F/Kg). The commonly used marketing channels which better paid producers, and in which the trading partners of the producers performed their lowest marketing margins, were the channels 8 and 9. The results on sorghum market were quite similar to those on pearl millet market.

Since collective marketing has been revealed ensuring a good payment to producers and a fair transaction with producers' trading partners, and that processors are interested in improved grain varieties for better quality and price for their processed products, it is hypothesized that arranging for the marketing of improved grain varieties between producer organizations and processors will be efficient. The marketing linkage between producer organizations and processors through contractual arrangements has the advantage to guarantee the flow of products with special requirements, coordinate product delivery, reduce uncertainty about product quality for processors, and to lower income risks for producers. Thus, it is suggested to the HOPE project to investigate this line of development research.

Key words: HOPE project, market access, marketing channel, structure conduct and performance.

1- Introduction

Understanding the functioning of agricultural markets has long been crucial for research practitioners and policy makers to determine niche markets and identify specific market requirements which specific sellers should meet to stay in business and make sustainable profits. This gains significance for developing countries, especially for Sub-Saharan African countries, where markets are considered not working well for farmers (Kherallah et al., 2002). As pointed out by Gabre-Madhin (2006), "the fundamental market problem in the twenty-first century is to understand how markets function, what roles different institutions play in supporting market exchange, and how to design, transfer, and maintain these institutions". This call is to work toward getting the right institutions for getting markets right. In this line, Barrett (2008) demonstrates that the access to improved technologies and productive assets stimulates smallholder market participation and escape them from semi-subsistence poverty traps. Thus, providing improved technologies for increased marketable produce surpluses and proposing market strategies to farmers become a valuable development intervention.

The HOPE project aims to contribute to the increase in the productivity of pearl millet and sorghum in Sub-Saharan African cereal-based production systems in order to improve household incomes and food security. The project intends to promote high-productivity technologies such as improved varieties through innovative delivery systems. The implementation of this five-year project starts in Mali in 2009. A survey has been done to assess the baseline market situation of pearl millet and sorghum grains in order to target some market interventions and measure their effects at the end of the project. The baseline market situation will help to characterize the existing marketing channels of pearl millet and sorghum grains and identify the channels which can be arranged innovatively for producers to get better grain prices which will ensure better revenues since grain quantities will increase with the adoption of the improved varieties.

The rest of this report proceeds as follows. Section 2 provides an overview of the HOPE project and the grain market in Mali. Section 3 briefly reviews the traditional Structure-Conduct-Performance paradigm for market study and describes the procedure for data collection and the data sources. Section 4 regards the results on the pearl millet and sorghum markets.

Section 5 contains a discussion of strategic market-oriented actions for the implementation of HOPE. Section 6 concludes.

2. Background

Mali is a landlocked country in the West African Sahel. Apart from the mining industry (gold and uranium resources), Mali's key industry is agriculture. Cereals account for approximately 70% of the total calories in an average Malian diet. Pearl millet, maize, sorghum and rice represent the major staple crops providing the cereal calories. Subsistence farming leads to only about 15-20% of the total grain production which is marketed (Dembélé and Staatz, 1999; Egg and Wade, 2006). In this context, improving the linking farmers to markets is an important issue.

The "Harnessing Opportunities for Productivity Enhancement of Sorghum and Millets in Sub-Saharan Africa and South Asia" (HOPE) Project envisions an integrated value chain analysis to increase the productivity of sorghum and millet production systems in Mali during the period 2009-2013. It aims to enhance the collaboration of all value chain actors to enhance access to markets, credit, seeds, inputs, and know-how in order to stimulate technology adoption that can increase the marketable produce surpluses and improve incomes, food security and livelihoods for rural households. Key project stakeholders are the farmer organizations (producer groups and cooperatives organized in 2 farmer unions federating in an association of farmer organizations). They are, inter alia, trained in the production of improved seeds that farmers can access to produce more and market more.

The grain market is comprised of various types of traders. Assemblers employ collectors (hereafter referred to as rural assemblers) to assemble the grains from the producers. Wholesalers, which finance the marketing functions, operate in the large assembling centers such as Sikasso, Segou, Mopti and Koutiala; they buy the grains from assemblers and sell to semi-wholesalers and retailers, which in the end sell to consumers (Dème and al., 2005). Grain trade in Mali has undergone a crucial reform since 1981, with the PRMC (Cereals Market Restructuring Project). The objective of the reform was, at the trader level to reduce marketing costs, and at the producer level to increase farm-level demand and hence farmers' incentives to produce cereals for the market (Staatz and al., 1989). Traders expanded their investments in the grain marketing business, particularly in storage and transportation capacity. The response

of traders and farmers depended on their access to productive resources, improved technologies, information and credit. Malian cereals markets became more integrated, both among themselves and with markets in neighboring countries (Dembélé and Staatz, 1999; Egg and Wade, 2006).

3. Methodology

3.1. Theoretical framework

This study employs the industrial organization paradigm which examines the structure, conduct and performance (SCP) of a market. Following the argument of Bain and his school who developed the approach, the way actors are organized in the market (the structure) tells a great deal about how they make decisions (their conduct), which in turn influences the level of efficiency and fairness present in the market (their performance).

The method elaborates on three parts (Clodius et Mueller, 1961; Scherer, 1980). Structure regards the characteristics of the organization of the market, which can influence strategically the formation of market price; the existing marketing channels and institutions defining the rules of the game relate to the market structure. Conduct relates to how the market actors operate (i.e. their price strategies). Performance is about the economic results of the functioning of the market; this is studied through market integration (following dynamic/temporal considerations) or margins analysis (following static/spatial considerations); while market integration focuses on the extent to which demand and supply shocks arising in one location are transmitted to other locations (Fackler and Goodwin, 2001), margins analysis—standing for market efficiency—rather focuses on the extent to which prices of homogeneous goods sold at different locations are equal, net of transaction costs (Barrett and Li, 2002).

A number of applications of the SCP framework exist in the literature, but they mix the evidence to predict the real performance from real structures, and vice-versa, as well as the determination of behavior (conduct) from the structures (Harris and al., 1995). This gives rise to a holistic approach based on the interrelations between the market actors. Although such an institutional method for analyzing markets is promising, this study adopts the SCP model for the

purposes of describing market actors and marketing channels, and analyzing prices and marketing margins.

3.2. Empirical process

During the first week of January 2011, a short survey of 9 markets was done in Mali. These markets were selected by the National Agricultural Research Institute INERA on the basis that they represent the major grain markets in the intervention zone of the HOPE project in Mali. In each market, about 4 to 5 actors commercializing pearl millet and sorghum were randomly interviewed to collect data mainly on quantities traded, prices, transportation costs and storage costs. In total, there were 43 market actors of different types: producers, assemblers, wholesalers, retailers and consumers (Table 1).

Table 1: Actors and markets surveyed in Mali

Actors	Count	%	Markets
Producers	5	12	Koutiala and Youdiou
Assemblers	9	21	Madiama, Siby, Sikasso, Sougouba and Youdiou
Wholesalers	11	26	Bamako, Dioila, Koutiala, Segoussougou, Siby and Sougouba
Retailers	17	39	Bamako, Dioila, Koutiala, Segoussougou, Siby and Sougouba
Consumers	1	2	Bamako
Total	43	100	

Producers and consumers were lowly represented in the sample. Assemblers, representing 21% of the sample, were present in about half of the markets surveyed. Wholesalers and retailers, representing 26% and 39% of the sample, respectively, were encountered in the same markets, two-thirds of the markets surveyed.

Very few traders were surveyed, and processors were not even surveyed. Though, combining the data collected with qualitative information from a consultative meeting between value chain actors, permitted to capture below some baseline picture of the pearl millet and sorghum markets in Mali. For each product, the market structure is analyzed through the buying partners and the selling partners of the actors surveyed, followed by the marketing map. Then, the conduct of the market actors is analyzed through the assessment of quantities traded and price distribution along the marketing channels identified. Finally, to match with the HOPE project's goal, performance of the grain market is assessed by the marketing margins net of

transportation and storage costs at the linkage between the producers and their trading partners along the marketing channels. Ideally, these margins are closer to the null value.

4. Structure, conduct and performance of the pearl millet and sorghum markets

4.1. The case of pearl millet market

The volume of pearl millet grains bought by an average assembler was 87.6 tons/year; the important sources of supply for assemblers were producer groups, individual producers, rural assemblers and cooperatives; assemblers sold on average 86.5 tons/year, mainly to wholesalers and exporters (Figure 1). The volume bought by an average wholesaler was 6790.2 tons/year, originating mainly from rural assemblers; wholesalers sold on average 6789.9 tons/year, their main clients being urban wholesalers, exporters and rural retailers (Figure 2). An average retailer bought 231.3 tons/year, mainly from individual producers and producer groups; retailers sold on average 231.2 tons/year, mainly to rural wholesalers and retailers (Figure 3). Wholesalers could trade among themselves, and so could retailers; some wholesalers were also present in the retail market.

Hence, individual producers and producer groups represent the major sources of supplying assemblers and retailers with pearl millet grains. Assemblers in general and rural assemblers in particular are the major sources of supplying wholesalers with pearl millet grains.

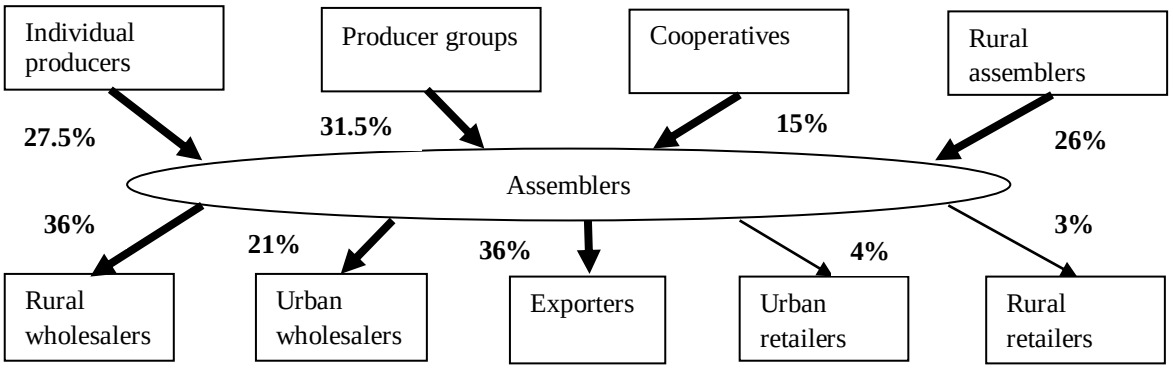

Figure 1: Buying and selling partners of pearl millet grain assemblers in Mali

Source: Baseline market survey in Mali

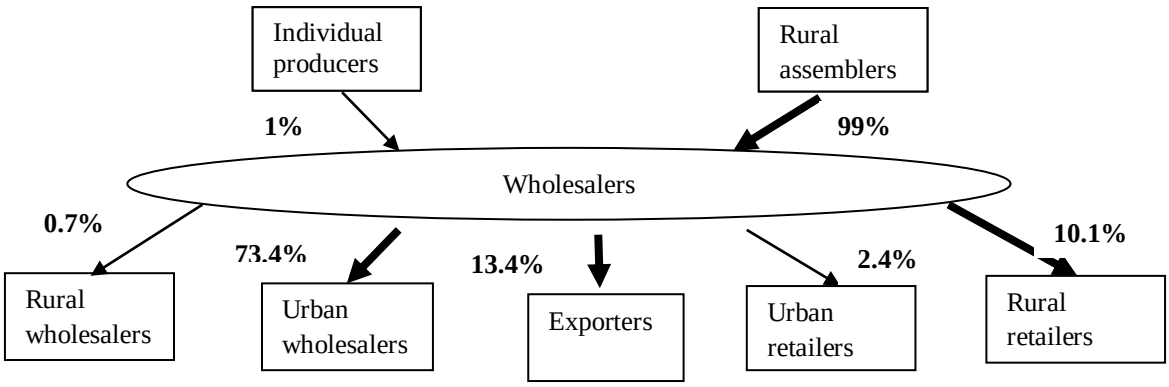

Figure 2: Buying and selling partners of pearl millet grain wholesalers in Mali

Source: Baseline market survey in Mali

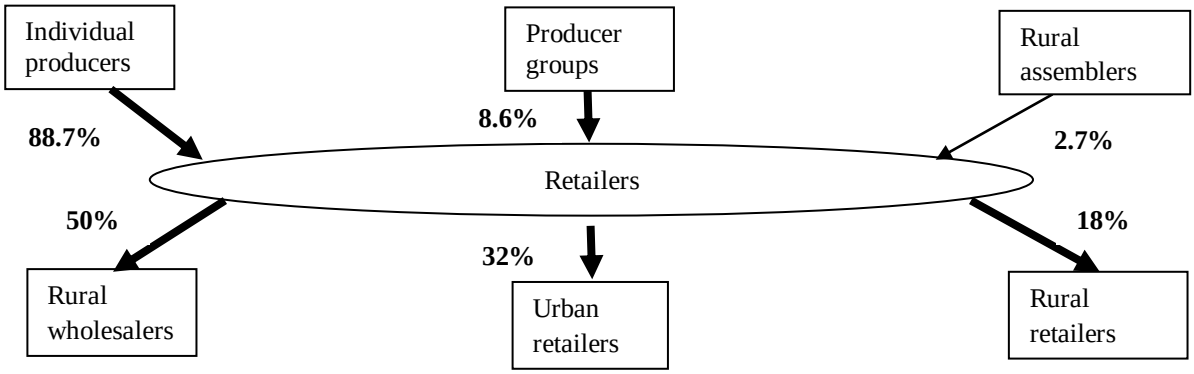

Figure 3: Buying and selling partners of pearl millet grain retailers in Mali

Source: Baseline market survey in Mali

The above description of the product flows between the diverse actors can be summarized in Figure 4. Only were the main buying and selling partners considered. For purposes of simplicity of the chain[1], individual producers and rural assemblers were put together while producer groups and cooperatives were put together.

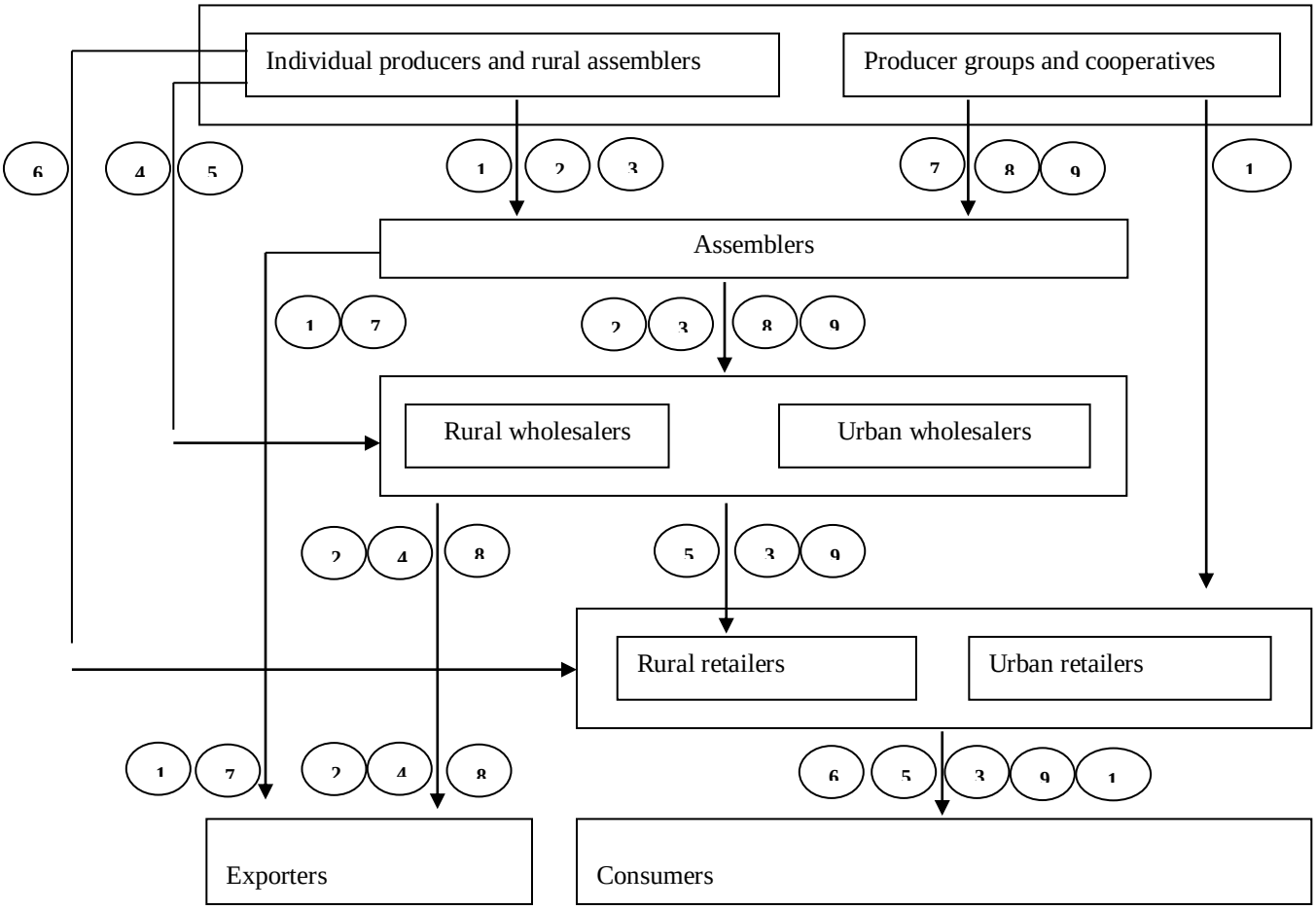

Figure 4: Pearl millet grain marketing chain in Mali.

Source: Baseline market survey in Mali

Ten channels co-existed for the pearl millet grain marketing:

1) Individual producers and rural assemblers-Assemblers-Exporters
2) Individual producers and rural assemblers-Assemblers-Wholesalers-Exporters
3) Individual producers and rural assemblers-Assemblers-Wholesalers-Retailers-Consumers

[1] This was also supported by the similar price levels practiced by individual producers and rural assemblers on one hand and by the producer groups and the cooperatives on the other hand.

4) Individual producers and rural assemblers-Wholesalers-Exporters
5) Individual producers and rural assemblers-Wholesalers-Retailers-Consumers
6) Individual producers and rural assemblers-Retailers-Consumers
7) Producers groups and cooperatives-Assemblers-Exporters
8) Producers groups and cooperatives-Assemblers-Wholesalers-Exporters
9) Producers groups and cooperatives-Assemblers-Wholesalers-Retailers-Consumers
10) Producers groups and cooperatives-Retailers-Consumers

Marketing channels 3, 5, 6, 9 and 10, where the end-users of grains are consumers, are more common than marketing channels 1, 2, 4, 7 and 8, where the end-users of grains are exporters. Within the first set, the most common marketing channels are the channels 3 and 9, in which assemblers, wholesalers and retailers participate in the marketing. Within the second set, the most common marketing channels are the channels 2 and 8, in which assemblers and wholesalers participate in the marketing.

Quantities purchased, quantities lost during transportation and from storage, and quantities sold, are presented in Table 2 for assemblers, wholesalers and retailers. They indicate that wholesalers and retailers mostly traded the local varieties of pearl millet grains rather than the improved varieties, conversely to assemblers. In fact, the consultative meeting between value chain actors supported these findings. The pearl millet marketing rested on the marketing of grains of local varieties since wholesalers and retailers, the largest traders of pearl millet, rarely traded the improved grain varieties. Processors were the main actors using the improved grain varieties and assemblers were the main actors who supplied them with those grains.

Table 2: Average quantities of pearl millet traded by the market actors

Actor	Volume bought (kg/year)			Volume lost (kg/year)	Volume sold (kg/year)
	Local varieties	Improved varieties	Total		
Assemblers	29,970	57,600	87,570	1,050	86,520
	34.22%	**65.88%**	**100%**	**1.20%**	**98.80%**
Wholesalers	6,790,167	0	6,790,167	230	6,789,937
	100%	**0%**	**100%**	**0.00%**	**100.00%**
Retailers	231,225	100	231,325	80	231,245

	99.96%	**0.04%**	**100%**	**0.03%**	**99.97%**

Source: Baseline market survey in Mali

The volume traded by an average wholesaler is huge, confirming that each wholesaler is linked to many assemblers in practice for their supply with pearl millet grains. Wholesalers were active both in the regional market and in the domestic retail market as they were linked to urban wholesalers, exporters and retailers.

During the course of marketing the grains, the market actors incurred some losses due to transportation and storage. As expected from the background session above, those losses were marginal in Mali. Still, losses were relatively higher for the small traders (assemblers) than the large traders (wholesalers and retailers) of pearl millet grains.

Price distribution along the marketing channels identified is presented in Figure 5. Among the marketing channels where the end-users of grains are consumers, the highest producer price levels were achieved when producer groups and cooperatives sold to retailers (140 F/Kg in the channel 10) and when individual producers and rural assemblers sold to wholesalers (113 F/Kg in the channel 5). Among the marketing channels where the end-users of grains are exporters, the highest producer price levels were achieved when individual producers and rural assemblers sold to wholesalers (113 F/Kg in the channel 4) and when producer groups and cooperatives sold to assemblers (109 F/Kg in the channel 8). Thus, the highest producer price levels were achieved when large individual suppliers sold to wholesalers or when producers organized collective sales. Marketing channels with producer organizations as suppliers of pearl millet were the only channels commonly used, which offered good price to producers.

Note that the price levels on which this analysis is made, apply only to January (the survey period). However, the consultative meeting indicated that producer organizations in Mali participated actively in the marketing of pearl millet. Since the marketing channels where producer organizations played, have been revealed ensuring better payment to producers (Figure 5), they can be promoted and enhanced, provided that they also ensure reduced transaction costs and reduced marketing margins.

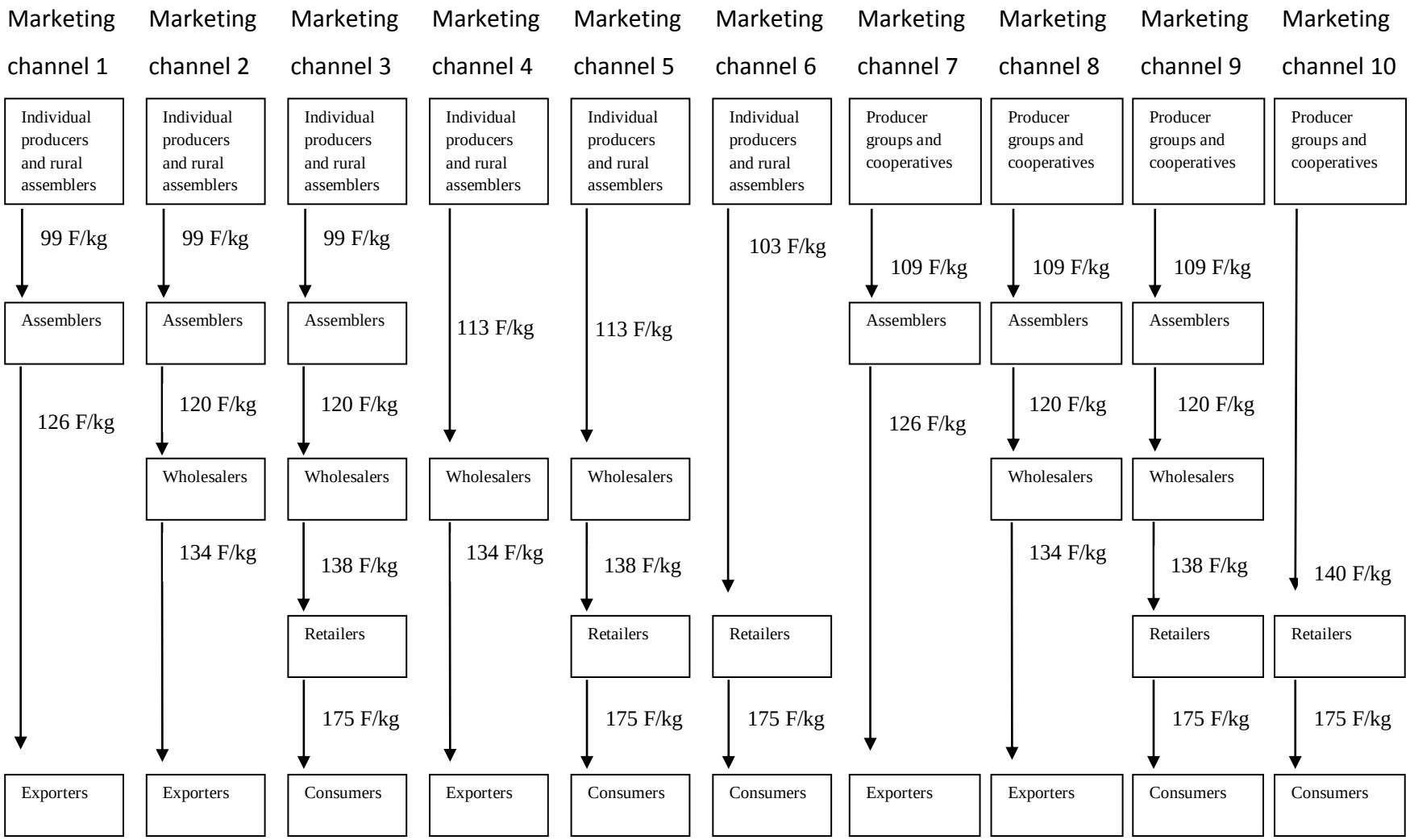

Figure 5. **Price transmission along the pearl millet grain marketing channels in Mali**

Beyond producer prices, marketing margins net of transaction costs were analyzed. Table 3 indicates that assemblers realized higher marketing margins when buying the pearl millet grains from individual producers and rural assemblers (marketing channels 1, 2 and 3) than when buying from producer groups and cooperatives (marketing channels 7, 8 and 9). This again showed that the increase in bargaining power for producer organizations translated into lower marketing margins for their trading partners. Wholesalers realized higher marketing margins in the domestic market (marketing channel 5) than in the regional market (marketing channel 4). This suggested that the export market is better regulated than the domestic market. Like in the case of assemblers, retailers realized higher marketing margins when buying the pearl millet grains from individual producers and rural assemblers (marketing channel 6) than when buying from producer groups and cooperatives (marketing channel 10).

In definitive, marketing channels 8 and 9, where producer organizations were the suppliers of pearl millet to assemblers who sold to wholesalers participating either in the regional market or in the domestic market, performed the lowest marketing margins. As these two marketing channels already represent some channels commonly used, the suggestion goes toward maintaining them. Since collective marketing has appeared as a good marketing strategy for farmers to get less exploited by their selling partners, the suggestion goes toward testing if this also applies when producer organizations sell to processors.

Table 3: Pearl millet grain marketing margins in Mali

Marketing channels	Partner buying from the producers	Purchasing price (F/kg)	Transportation costs (F/kg)	Storage Costs (F/kg)	Total transportation and storage costs (F/kg)	Selling price (F/kg)	Gross revenue* (F/kg)	Marketing margins net of transaction costs (F/kg)
1	Assembler	99	7.17	0.19	7.36	126	124.49	18.13
2 and 3	Assembler	99	7.17	0.19	7.36	120	118.56	12.20
4	Wholesaler	113	18.17	0.20	18.37	134	134.00	2.63
5	Wholesaler	113	18.17	0.20	18.37	138	138.00	6.63
6	Retailer	103	19.42	0.24	19.66	175	174.95	52.29
7	Assembler	109	7.17	0.19	7.36	126	124.49	8.13
8 and 9	Assembler	109	7.17	0.19	7.36	120	118.56	2.20
10	Retailer	140	19.42	0.24	19.66	175	174.95	15.29

*Gross revenue=Selling price*Percentage of volume not lost during the transaction

4.2. The case of sorghum market

The volume of sorghum grains bought by an average assembler was 122.08 tons/year; this quantity was mainly provided by producer groups, cooperatives and individual producers; assemblers sold on average 121.08 tons/year, mainly to rural wholesalers and rural retailers (Figure 6). The volume bought by an average wholesaler was 5017.16 tons/year quasi-sourced from rural assemblers; wholesalers sold a volume of about 5016.98 tons/year, mainly to urban wholesalers, exporters and rural retailers (Figure 7). An average retailer bought 2 tons/year, mainly from individual producers; retailers sold on average 1.93 tons/year, mainly to rural retailers (Figure 8). Similarly to the pearl millet marketing, wholesalers could trade among themselves, and so could retailers; some wholesalers were also present in the retail market. Figures 6-8 show that producer organizations were directly supplying sorghum to assemblers, but were not to wholesalers and retailers.

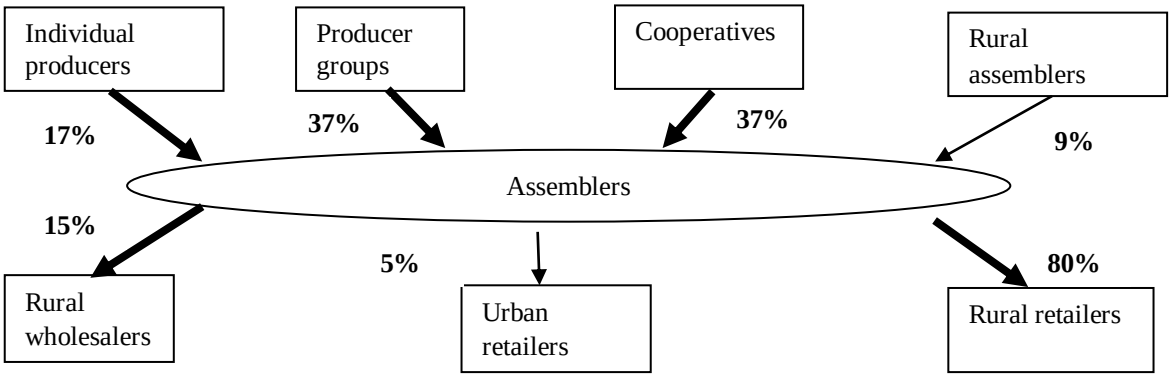

Figure 6: Buying and selling partners of sorghum grain assemblers in Mali

Source: Baseline market survey in Mali

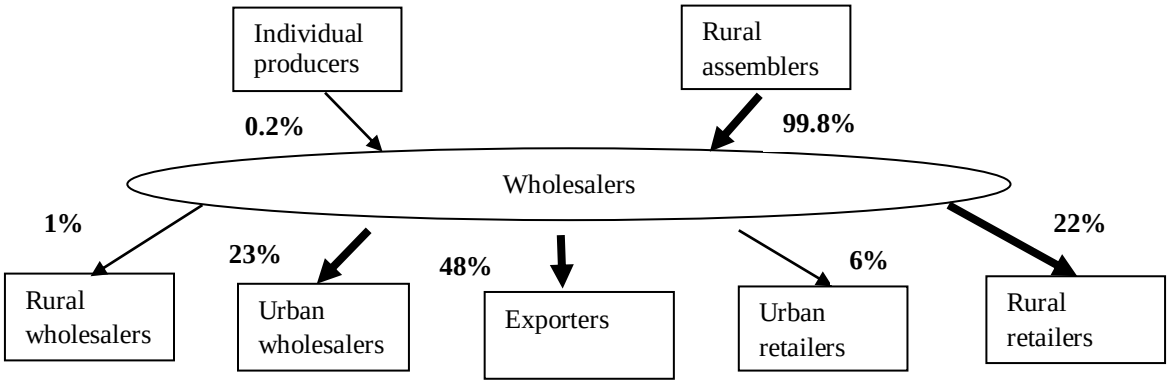

Figure 7: Buying and selling partners of sorghum grain wholesalers in Mali.

Source: Baseline market survey in Mali

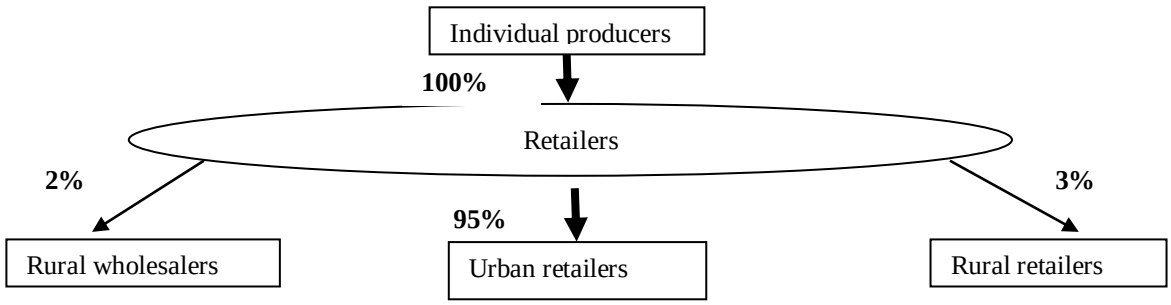

Figure 8: Buying and selling partners of sorghum grain retailers in Mali.

Source: Baseline market survey in Mali

The main flows of sorghum grains between the market actors were tracked in Figure 9. Nine marketing channels co-existed:

1) Individual producers and rural assemblers-Assemblers-Wholesalers-Retailers-Consumers
2) Individual producers and rural assemblers-Assemblers-Wholesalers-Exporters
3) Individual producers and rural assemblers- Assemblers-Retailers-Consumers
4) Individual producers and rural assemblers-Wholesalers-Exporters
5) Individual producers and rural assemblers-Wholesalers-Retailers-Consumers
6) Individual producers and rural assemblers-Retailers-Consumers

7) Producers groups and cooperatives-Assemblers-Wholesalers-Exporters
8) Producers groups and cooperatives-Assemblers-Wholesalers-Retailers-Consumers
9) Producers groups and cooperatives-Assemblers-Retailers-Consumers

Marketing channels 1, 3, 5, 6, 8 and 9, where the end-users of grains are consumers, are more common than marketing channels 2, 4 and 7, where the end-users of grains are exporters. Within the first set, the most common marketing channels are the channels 1 and 8, in which assemblers, wholesalers and retailers participate in the marketing. Within the second set, the most common marketing channels are the channels 2 and 7, in which assemblers and wholesalers participate in the marketing.

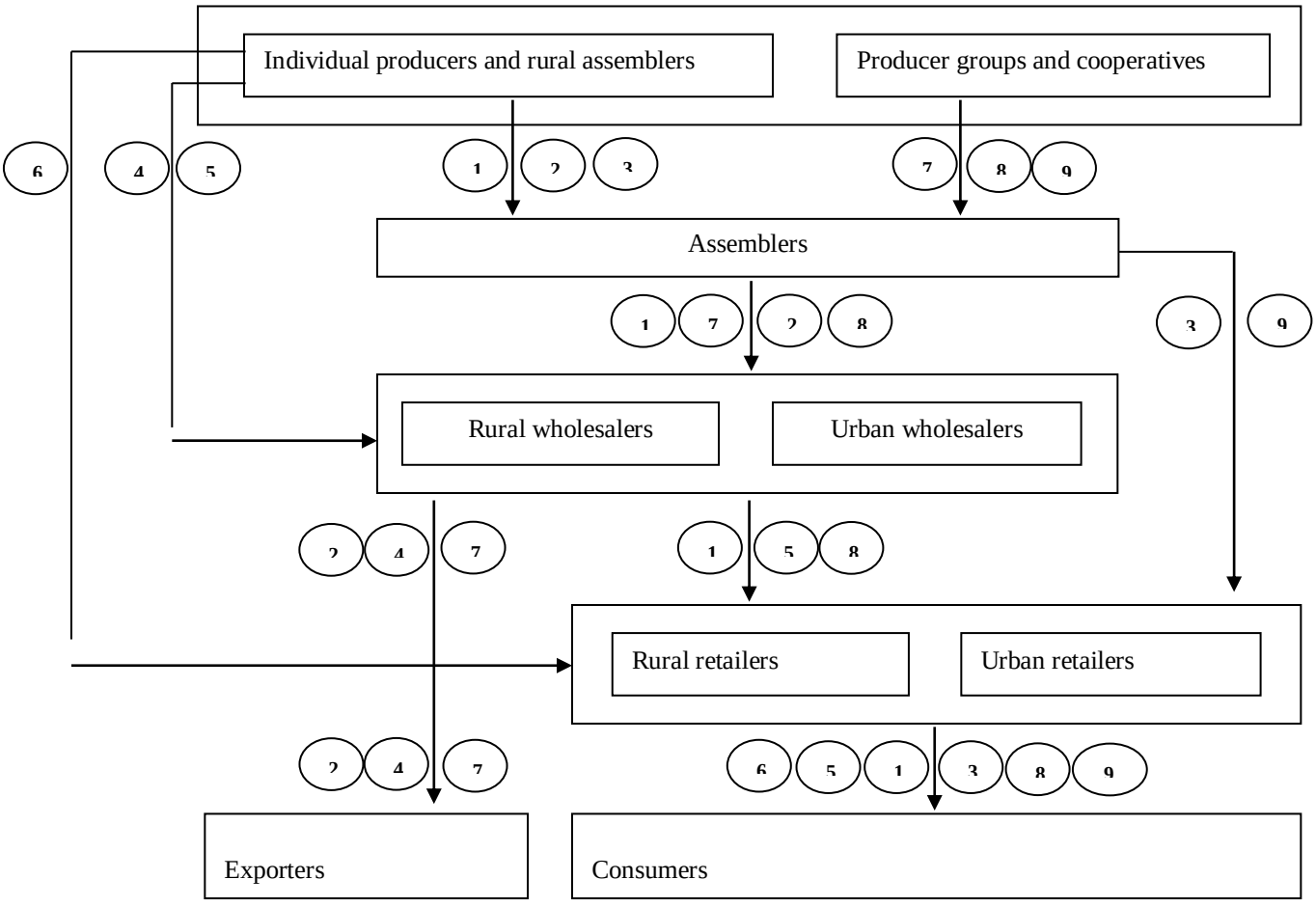

Figure 9: Sorghum grain marketing chain in Mali.

Source: Baseline market survey in Mali

Table 4 gathers quantities purchased, quantities lost during transportation and from storage, and quantities sold, for assemblers, wholesalers and retailers. It indicates that wholesalers and retailers mostly traded the local varieties of sorghum grains rather than the improved varieties, conversely to assemblers. As noticed for pearl millet, processors were the main actors using the improved varieties and assemblers were the main actors who supplied them with those grains.

Table 4 also showed that an average wholesaler traded 41 times the volume of sorghum traded by an average assembler. The volume traded by an average retailer was thin compared with the wholesaler's volume and the assembler's volume. Grain losses due to transportation and storage followed the same pattern: they were negligible for wholesalers and assemblers, but not for retailers, though less than 5%.

Table 4: Average quantities of sorghum traded by the market actors

Actor	Volume bought (kg/year)			Volume lost (kg/year)	Volume sold (kg/year)
	Local varieties	Improved varieties	Total		
Assemblers	20,480	101,600	122,080	1,000	121,080
	16.8%	**83.2%**	**100.0%**	**0.8%**	**99.2%**
Wholesalers	5,017,167	0	5,017,167	184	5,016,983
	100.0%	**0.0%**	**100.0%**	**0.0%**	**100.0%**
Retailers	2,000	0	2,000	70	1,930
	100.0%	**0.0%**	**100.0%**	**3.5%**	**96.5%**

Source: Baseline market survey in Mali

Price distribution along the nine marketing channels identified (Figure 10) show that, among the marketing channels where the end-users of grains are consumers, the highest producer price levels were achieved when individual producers and rural assemblers sold to retailers (116 F/Kg in the channel 6) and when producer groups and cooperatives sold to assemblers (113 F/Kg in the channels 8 and 9). Among the marketing channels where the end-users of grains are exporters, the highest producer price levels were achieved when producer groups and cooperatives sold to assemblers (113 F/Kg in the channel 7).

Remarkably, the highest producer price level corresponded to sales by individual suppliers to retailers. Since sorghum retailers were small traders, their best buying partners were the individuals that could supply them with their whole quantity in one transaction. An individual producer or a rural assembler selling through this channel rewarded a minimum of 3F/kg more than selling otherwise. But, this channel was less commonly used by farmers.

The most commonly used marketing channels which offered a better price to producers, were the channels 8 and 9 in which producers organized collective sales. This suggests producers to sell in groups rather than individually.

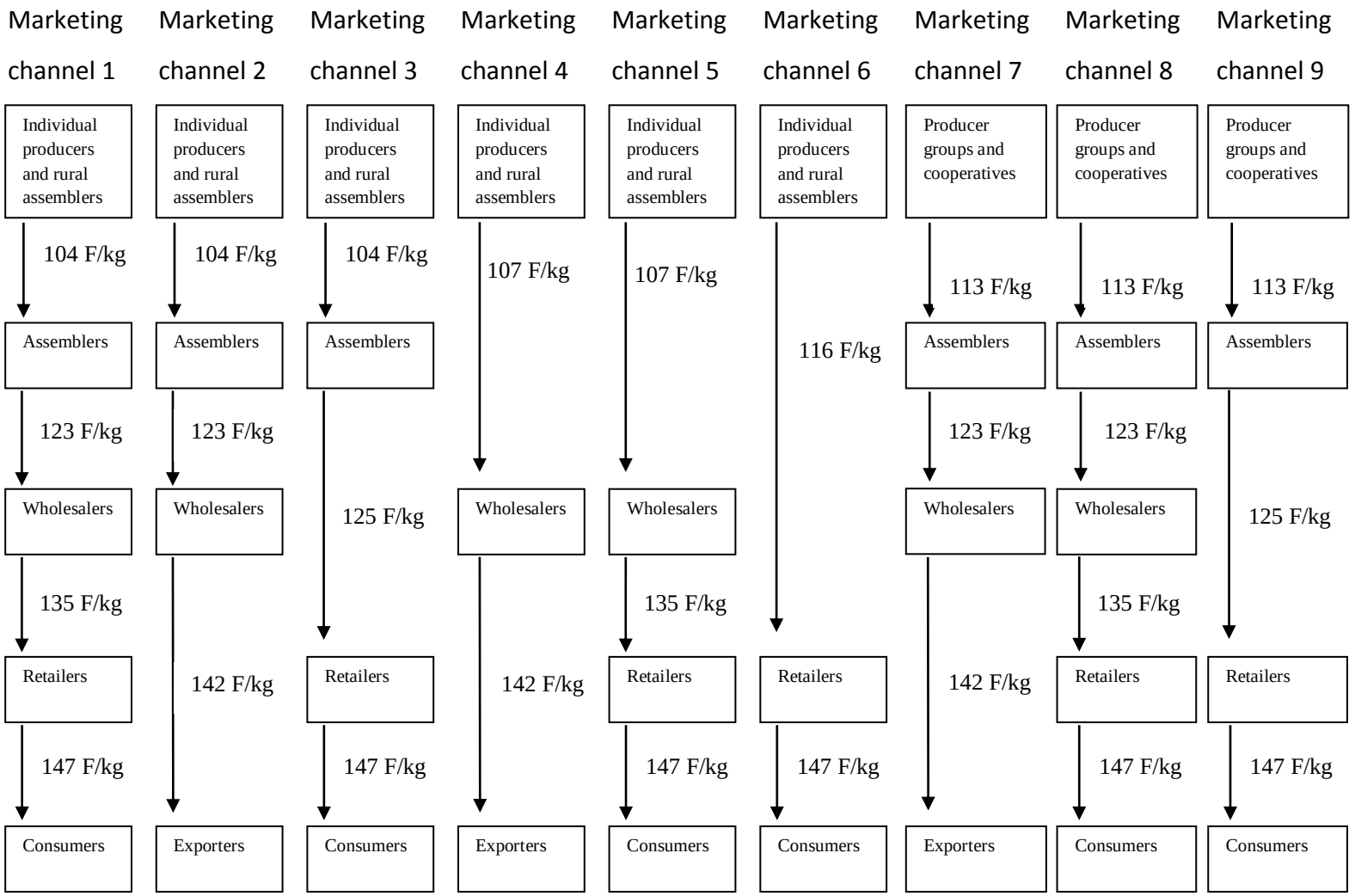

Figure 10. Price transmission along the sorghum grain marketing channels in Mali.

As for the perspective of sorghum market performance, Table 5 highlights that assemblers captured important marketing margins net of transportation and storage costs, when buying the sorghum grains from individual producers and rural assemblers (marketing channels 1, 2 and 3) against buying from producer groups and cooperatives (marketing channels 7, 8 and 9). Thus, collective marketing increased the bargaining power of producers and reduced the marketing margins net of transportation and storage costs for their usual trading partners (assemblers).

Another highlight regarded wholesalers, which were revealed achieving better marketing margins in the regional market (marketing channel 4) than in the domestic market (marketing channel 5). This result was opposite to the finding for pearl millet, and might be due to the differences in the export market and the retail market between the two products.

Moreover, retailers represented the traders profiting the less from sorghum marketing. Buying from individual suppliers to sell to retailers, and buying from producer organizations to sell to assemblers were fairer than otherwise. This suggests farmers to either sell directly to retailers or organize themselves for collective marketing.

Table 5: Sorghum grain marketing margins in Mali

Marketing channels	Partner buying from the producers	Purchasing price (F/kg)	Transportation costs (F/kg)	Storage Costs (F/kg)	Total transportation and storage costs (F/kg)	Selling price (F/kg)	Gross revenue* (F/kg)	Marketing margins net of transaction costs (F/kg)
1 and 2	Assembler	104	7	0.14	7.14	123	122.02	10.876
3	Assembler	104	7	0.14	7.14	125	124.00	12.86
4	Wholesaler	107	19	0.15	19.15	142	142.00	15.85
5	Wholesaler	107	19	0.15	19.15	135	135.00	8.85
6	Retailer	116	20	4.25	24.25	147	141.86	1.605
7 and 8	Assembler	113	7	0.14	7.14	123	122.02	1.876
9	Assembler	113	7	0.14	7.14	125	124.00	3.86

*Gross revenue=Selling price*Percentage of volume not lost during the transaction

Source: Baseline market survey in Mali

5. Conclusions and discussions

5.1. Discussions

From the results above, it was a good marketing strategy if Malian farmers sold individually their pearl millet grains to wholesalers and their sorghum grains to retailers. Commonly however, farmers used to marketing collectively their pearl millet and sorghum grains and this strategy was revealed ensuring a good payment to them and a fair transaction with their trading partners. In addition, there was evidence of the marketing of improved grain varieties along a unique existing channel: farmers-assemblers-processors. Processors have interest in improved grain varieties for better quality and price for their processed products. With the implementation of the HOPE project, improved grain varieties would get promoted and profit assemblers better than farmers. To integrate all these, it emerges for the HOPE project, one strategy targeting market access for pearl millet and sorghum smallholder farmers in Mali, which is to support direct marketing linkage between farmers' organizations and processors.

The question of suggesting producer marketing groups as an efficient mechanism for increasing market access and reducing poverty is not a new idea (Poulton et al., 2006). Economic advantages cooperatives may offer farmers include: creation of competitive yardstick, correction of market failure, market power avoidance, provision of missing services, economies of size, profits from another level of the supply chain, guarantee of supplies or markets, risk reduction, and gain from coordination (Schrader, 1989). There is evidence of the marketing performance of collective action among farmers (Kaganzi et al., 2009; Okello and Swinton, 2007). Collective action helps smallholders to reach larger domestic urban, regional and international markets, and may enable them to deal with transportation and storage issues, acquire technologies and certificates to comply with required quality standards, and reach the necessary scale to supply the desired quantity of their products (Markelova et al., 2009). However, institutional arrangements are crucial to make collective marketing effective.

The marketing linkage between farmers' organizations and processors through contractual arrangements has the advantage to guarantee the flow of products with special requirements, coordinate product delivery, reduce uncertainty about product quality for processors, and to

lower income risks for producers (Glover, 1987; Kirsten and Sartorius, 2002; Key and McBride, 2003). Since HOPE Project is interested in increasing market access and incomes, and already works with farmer organizations to produce improved seed varieties, it then becomes promising to pilot a focus on the production of seed varieties required by processors, which can be used to produce grains by the members of the farmer organizations; subsequently, contracts between the farmer organizations and the processors can be arranged and their effectiveness analyzed.

5.2. Concluding remarks

It turns out from the analysis of the structure, conduct, and performance of pearl millet and sorghum markets in Mali that there is fair trade as farmers sell through their organizations. In the wake of the HOPE project strengthening the pearl millet and sorghum value chains to work better for farmers, it is hypothesized that arranging for the marketing of improved grain varieties between producer organizations and processors will be efficient. Therefore, the HOPE project can consider this line of development research. Besides, there are some limitations in this study which have to be highlighted. This document does not assess any variation of its main results with different localities/markets and across periods. The experiment suggested to the HOPE project is subject to the respective contractual preferences of farmer organizations and processors. In addition, promoting one marketing channel over the others will create some changes in the marketing chain which have not been discussed. It is worth addressing further those issues.

References

BARRETT, C. (2008), Smallholder Market Participation: Concepts and Evidence from Eastern and Southern Africa, *Food Policy* 33(2008): 299-317

BARRETT, C. and Li (2002), Distinguishing between Equilibrium and Integration in Spatial Price Analysis, *American Journal of Agricultural Economics* 84(2), 292-307

CLODIUS, R. L. and W. F. MUELLER (1961), Market Structure Analysis as an Orientation of Research in Agricultural Economics, *Journal of Farm Economics*, 43, 3, 515-553

DEMBELE, N. N. and J. M. STAATZ (1999), The Response of Cereals Traders to Agricultural Market Reform In Mali, MSU Staff Paper 99-27

DEME, S. K., N. N DEMBELE, J. M. STAATZ, and A. TRAORE (2005), Note sur la Problématique d'Approvisionnement des Céréales au Mali, PROMISAM, Document de travail no. 05-01

EGG, J. and I. Wade (2006), Bilan et Perspectives des Cultures Vivrières dans les Pays du Sahel, OCL Vol. 13 N° 4, Juillet-Août 2006

FACKLER, P. and B. Goodwin (2001), Spatial Price Analysis, *In* Handbook of Agricultural Economics, Chapter 17, Volume 1, 2001, eds., B. Gardner and G. Rausser, Elsevier, The Netherlands

GABRE-MADHIN, E. Z. (2006), Building Institutions for Markets: The Challenge in the Age of Globalization, *In* EGDI, ed., Agricultural Development in Sub-Saharan Africa, 65-111, Stockholm, Sweden.

GLOVER, D. (1987), Increasing the Benefits to Smallholders from Contract Farming: Problems for Farmers' organizations and Policy Makers, *World Development* 15 (4), 441–448

HARRISS J., J. HUNTER and C. M. LEWIS (1995), eds., The New Institutional Economics and Third World Development, Routledge

KAGANZI E., S. FERRIS, J. BARHAM, A. ABENAKYO, P. SANGINGA, and J. NJUKI (2009), Sustaining linkages to high value markets through collective action in Uganda, *Food Policy* 34 (2009): 23–30.

KEY, N. and W. McBRIDE (2003), Production contracts and productivity in the U.S. hog sector, *American Journal of Agricultural Economics Association* 85(1), 121-133

KHERALLAH, M., C. L. DELGADO, E. Z. GABRE-MADHIN, N. MINOT and M. JOHNSON (2002), Reforming Agricultural Markets in Africa, Baltimore: The Johns Hopkins University Press, Published for International Food Policy Research Institute (IFPRI)

KIRSTEN, J. and K. SARTORIUS (2002), Linking Agribusiness and Small-Scale Farmers in Developing Countries: is there a New Role for Contract Farming? *Development Southern Africa* Vol. 19, No. 4, October 2002

MARKELOVA H., R. MEINZEN-DICK, J. HELLIN, and S. DOHRN (2009), Collective Action for Smallholder Market Access, *Food Policy* 34 (2009) 1–7.

OKELLO, J. J. and S. M. SWINTON (2007), Compliance with International Food Safety Standards in Kenya's Green Bean Industry: a Paired Case Study of Small and Large Family Farms. *Review of Agricultural Economics* 29(2): 269-285.

POULTON, C., KYDD J., and DOWARD A. (2006) Overcoming market constraints on pro-poor agricultural growth in Sub-Saharan Africa, *Development Policy Review* 24(2006): 243-277.

SCHERER, F. M. (1980), Industrial Market Structure and Economic Performance, 2nd ed. Chicago: Rand McNally

SCHRADER, L. F. (1989) Economic justification of cooperatives, in: Cobia, D.W. (ed.) Cooperatives in agriculture, Englewood Cliffs NJ: Prentice-Hall.

STAATZ, J. M., J. DIONE and N. N. DEMBELE (1989), Cereals Market Liberalization in Mali, *World Development* 17, no. 5: 703-18.