STRENGTHS AND WEAKNESSES OF ALTERNATIVE MODELS OF LINKING SMALLHOLDERS TO DOWNSTREAM VALUE ADDED ACTIVITIES IN MALI: A LITERATURE REVIEW

By

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ABSTRACT

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In Mali, agricultural activities are dominated by a large range of smallholders who devote themselves to semi-subsistence farming. Despite the recent trend of growing demand from urban areas, the linkage between smallholders and downstream segments of agribusiness is not working well. I use concepts from the new institutional economics to examine the governance structures of the value chains of agricultural subsectors in developing and transition countries, and we compared these governance structures in relation to commodity/food, and market destination with vertical coordination arrangements used presently in agribusiness in Mali.

The study reveals: (i) that strengthening farm-firm linkages through new governance can be mutually beneficial for both producers and firms; (ii) vertical coordination in agribusiness in Mali is weak and smallholders in Mali do not benefit fully from their outputs and so remain poor. The study recommends the improvement in general business climate and in aspects specific to agribusiness to improve the food system performance in Mali.
This work is dedicated to my Dad, Jean Paul, who has always supported me in my studies, but could not see that day.

May his soul rest in peace.
I would like to express my deepest gratitude to Dr. John Staatz, my thesis advisor, for his supervision, support and patience throughout my program. I would also like to express my special thanks to my guidance committee members, Dr. Eric Crawford and Dr. Mark Skidmore, for their invaluable comments on my thesis.

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I want to express my sincere gratitude to the Department staffs of AFRE and to the IPR/IFRA, especially my department chief Kardigue Coulibaly.

My sincere thanks to those who helped and supported me in completing my master’s program: Winneman Ayala, and Drs. Jenifer and Howard Banks.

Finally, I am very grateful to my mom Odile, my spouse Agnes, and my daughter Besseyi for their encouragements, patience and unconditional love.
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ACRONYMS

AMEPROC  Association Malienne des Exportateurs des produits de Cueillette

CF  Contract Farming

CFA  Communauté Financière d’Afrique

CAADP  Comprehensive African Agricultural Development Program

CMDT  Compagnie Malienne pour le Développement des Fibres Textiles

COOP  Cooperative

FAO  Food and Agriculture Organization

FFV  Fresh Fruit and Vegetables

GDCM  Grand Distributeur Céréalier du Mali

GDP  Gros Domestic Product

GIE  Groupement d’intérêt Economique

HUICOMA  Huilerie Cotonnière du Mali

ICT  Information and Communications Technology

IFAD  International Fond for Agriculture Development

IFPRI  International Food Policy Research Institute

IS  Individual smallholder
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
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<tbody>
<tr>
<td>LOA</td>
<td>Loi d’Orientation Agricole</td>
</tr>
<tr>
<td>MDFVL</td>
<td>Mother Dairy Fruit and Vegetable Limited</td>
</tr>
<tr>
<td>NDDB</td>
<td>National Dairy Development Board</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-Governmental Organization</td>
</tr>
<tr>
<td>NIE</td>
<td>New Institutional Economics</td>
</tr>
<tr>
<td>ON</td>
<td>Office du Niger</td>
</tr>
<tr>
<td>OPI</td>
<td>Organisation Patronale des Industries</td>
</tr>
<tr>
<td>PCDA</td>
<td>Programme de Compétitivité et Diversification Agricole</td>
</tr>
<tr>
<td>PIM</td>
<td>Programme Intégré du Mali</td>
</tr>
<tr>
<td>RS</td>
<td>Rupees</td>
</tr>
<tr>
<td>SODECOTON</td>
<td>Société de Développement du Coton</td>
</tr>
<tr>
<td>SSA</td>
<td>Sub-Saharan Africa</td>
</tr>
<tr>
<td>TAF</td>
<td>Taxe sur les Affaires Financières</td>
</tr>
<tr>
<td>TC</td>
<td>Transaction Cost</td>
</tr>
<tr>
<td>UNIDO</td>
<td>United Nation Industrial Development Organization</td>
</tr>
<tr>
<td>VC</td>
<td>Vertical Coordination</td>
</tr>
<tr>
<td>VI</td>
<td>Vertical Integration</td>
</tr>
</tbody>
</table>
Chapter I: Introduction

1. Problem statement

What are the strengths and weaknesses of alternative models of linking smallholders to downstream value added activities in Mali? This is a topical question for Mali. Indeed seventy-six percent of Malians live in rural areas, and agriculture and related activities remain the largest source of employment and income. Agriculture in the broad meaning (farming, animal husbandry, fishing), the backbone of Mali’s economic development strategy, is viewed as the engine of economic growth and the vehicle for poverty reduction, given its importance as a source of employment and income generation. Agriculture contributes to 33 percent of GDP and accounts for more than 80 per cent of the economically active population (ECOWAS-National Unit- Republic of Mali, 2010).

Agricultural activities in Mali are dominated by a large range of smallholders, peasants for whom the first goal is usually to feed themselves, via semi-subsistence farming, and to sell the surplus in the market place with a minimum processing (threshing and sacking of cereals, for example). Yields of the different food and non-food crops are low due mostly to the low use of inputs (e.g., improved seeds and fertilizer) and unstable rainfall. According to UNIDO,” In sub-Saharan Africa, despite strong growth in recent years, the number of people living on less than $1.25 a day increased by 93 million
during the period 1990 and 2005 (Montalvo & Ravallion 2010) cited by Roepstorff and Wiggins (2011). Thus, economic development for these countries should necessarily put strong emphasis on poverty reduction among peasants, especially smallholders in rural areas. “Governments and development agencies increasingly use value chain development as a key element in their development strategies. Frequently such strategies aim at improving the income of poor groups of the society through value addition” (Henriksen, et al., 2011).

Small farmers in sub-Saharan Africa (SSA), just like those in other developing regions, face numerous constraints that limit their productivity. First, they lack information about production methods and market opportunities, particularly for new crops and varieties. Second, even with sufficient information about profitable investments, small farmers often lack the necessary financial reserves to invest in new crops, and their access to credit is limited by the lack of collateral. Third, small farmers operating near subsistence are more risk-averse than larger farmers. They often prefer to assure themselves a minimum supply of food before expanding production of cash crops for an uncertain market.

According to FAO, smallholders in SSA do not get the type of reliable inputs that allow them to face the standards desired by downstream segments among others agro processors (Roepstorff and Wiggins, 2011). Mali, as many other African countries, is facing the same problems for development
in a context made more complex by a challenge of regional integration and globalization. There are many opportunities for agro-processing to enhance domestic value addition and to better link the agricultural sector to domestic, regional and international demand such as:

- Rice milling, maize and cassava processing into flours;
- Vegetable oil production;
- Fruit juices and beer;
- Animal feed based on maize, soybeans, oilseed cakes, and cassava pellets;
- Cotton textiles.

However, there are constraints that need to be overcome. These include, among others, limited physical infrastructure; weak access to energy, especially electricity; limited access to and high cost of finance (particularly TAF- tax on financial affairs); limited skills and human resources; insecure access to land; high cost of doing business due to regulatory constraints; and finally poor vertical coordination (Michigan State University Food Security Team, 2011).

A recent trend in developing countries is the increasing demand for processed products due to rising incomes, urbanization, and lifestyle changes that reduce the time that urban consumers are willing and able to spend on food purchase and preparation; this trend is driving the
transformation of agrifood system, especially in the agro processing segment (Reardon 2012, Joshi 2013, Thapa 2009). Despite this recent trend in Mali, the linkage of smallholders to downstream segments of agribusiness is not working well. In rural development efforts in Mali, the main strategy has been focused on increasing farm-level production, and therefore improving post-harvest operations has been relatively neglected. Thus, after the harvest, which usually occurs in the same period for most farmers, smallholders are left to themselves, often at the mercy of brokers or intermediates for cereals and bulk products.

Linking smallholders to value-added segments is important for those directly involved and for society as a whole. One reason is that at the harvest time, farmers with highly perishable products such as tomatoes in Office du Niger zone (ON) and mangoes in Sikasso suffer huge losses due to lack of coordination with buyers, especially with processors and exporters. Another reason is the lack of producers’ information about high value-added products or their production techniques. An example is that Koumalim-Nestle factory in Mali buys from Germany a variety of garlic as raw material for the production of its bouillon cubes known as “Maggy cubes”. Why is it that no one works with the small producers in the Dogon plateau and producers ON area specialized in the production of local garlic and shallots to supply this market?
My primary thesis is that policy makers should give preferential treatment to inserting farmers, in particular small ones, into off-farm segments of the value chain and providing better linkages with downstream segments, especially agro processing. Such an approach would be in the mutual interest for both agro processors and smallholders and increase employment in rural areas for the reduction of poverty. This approach of greater integration of small farmers into the downstream segments of the value chain offers a route to economic growth and poverty reduction, as well as the structural transformation of economies and the improvement of technical skills and capacity (Wilkinson & Rocha (2009) cited by Wiggins (2011)). Indeed, the Malian development strategy for the private sector after 2000 is based on the sustainability of economic growth with priority given to the fight against poverty and unemployment, especially among youth and disadvantaged groups. The LOA, the Loi d’Orientation Agricole—a law which lays out Mali’s long-term vision of agricultural development—provides broad guidelines on operational tools and funding mechanisms to implement and accelerate agricultural growth, and opens a path to modernization of agriculture in Mali based on competitive market-oriented family farms, while seeking to promote agro-industries and private investment in agriculture. Moreover, the Malian government has planned to make the private sector the engine of economic and social development (Programme de Compétitivité et de Diversification Agricole: PCDA, 2004). It therefore
adopted a Comprehensive Africa Agricultural Development Program (CAADP) compact, which calls for Mali to accelerate its GDP growth to a sustained rate of over 6% per year and its agricultural growth to over 9% per year. The compact is aimed at achieving the Malian government’s political goals of making the country a regional agricultural powerhouse, and ensuring the food security of all Malians (Michigan State University Food Security Team, 2011). The strategy aims to promote the sector to enable the emergence of successful businesses and professional groups whose dynamic actions will have a positive impact on domestic, regional and international trade. It is why with the help of UNIDO, the Malian government, in planning activities of Phase II of the project “Programme Intégré du Mali” (PIM), sought to strengthen industrial processing units based on the development of local agro-production into a strong market for domestic production. In addition, the strategy calls for the creation and strengthening a network of micro and small enterprises in rural areas, focusing on post-harvest-oriented market opportunities that provide products in sufficient quantities to meet the quality requirements of larger agro-processors and buyers (Coordinateur Regional, 2009)

This integration of farm-level production and the processing level in the agrifood system is aimed at gradually changing Mali’s agro-pastoral industry to be more competitive by facilitating access to the most profitable markets, thereby creating jobs and generating income especially for the poorest.
2. **Objectives**

How do agro-processing firms develop new institutional arrangements that benefit both themselves and farmers?

The purpose of this paper is to provide a literature review about effectively linking smallholders to downstream value-added segments of the food system, especially to agro-processing, a way that it mutually beneficial in the context of Mali. More specially, the paper intends to investigate such issues as (i) the processes adopted by different corporations in linking production and marketing of food commodities, (ii) the effect of such linkages on transaction costs and smallholder’s profitability, and (iii) the various policy options for strengthening vertical linkages between smallholders and the agribusinesses.

This study is important because it will enable decision-makers to have a global view of successful experiences in the world, especially in emerging countries, and bring the necessary corrections for better integration of small producers to the market.

**Organization of the paper**

This paper is organized into six chapters. The first chapter presents the problem statement, the study objectives, and the definition of some key terms used throughout the study. The second chapter discusses the conceptual framework—the New Institutional Economics—and background
on vertical coordination. The third chapter presents the research hypotheses. The fourth chapter presents an analytic review of selected experiences in vertical coordination around the world, particularly in emerging regions. The fifth chapter presents an overview of the situation of linking smallholders to downstream segments in Mali. Finally, the sixth chapter summarizes the major findings of the study and makes some policy recommendations.

3. Definition of key terms

According to FAO cited by Wiggins (2011),

**Agribusiness** is a broad concept that covers input suppliers, agro-processors, traders, exporters and retailers. Agribusiness provides inputs to farmers and connects them to consumers through the financing, handling, processing, storage, transportation, marketing and distribution of agro-industry products. It can be broken down further into four main groups:

a. Agricultural input industry,

b. Agro-industry,

c. Equipment for processing agricultural raw materials, including machinery, tools, storage facilities, cooling technology and spare parts, and
d. Various services, financing, marketing and distribution firms, including storage, transport, ICTs, packaging materials and design.

**Agro-industry** comprises all the post-harvest activities that are involved in the transformation, preservation and preparation of agricultural production for intermediary or final consumption of food and non-food products (Wilkinson, 2009).

**The agrifood system** encompasses the interlinked set of activities that run from “seed to table”, including agricultural input production and distribution, farm-level production, raw product assembly, processing and marketing.

**Agro-processing** is the “subset of manufacturing that processes raw materials and intermediate products derived from the agricultural sector. Agro-processing industry thus means transforming products originating from agriculture, forestry and fisheries.” (FAO (1997) cited by (Roepstorff and Wiggins, 2011)).
Chapter II: Conceptual framework

1. The new institutional economics, transaction costs and vertical integration

The new institutional economics (NIE) is the most useful way to analyze vertical coordination. Traditional neoclassical economics generally assumes that there is a set of market institutions, such as the laws, codes, and social norms, which define acceptable behavior. In addition, in its simpler forms, it sometimes assumes that economic agents have complete information and that transactions are costless. In contrast, NIE looks specifically at the factors that shape the design of economic institutions. It is based on the view that market institutions evolve to reduce costs and adapt to the specific problems associated with each sector (Grosh 1994, cited by Minot (Minot, 2011)) .

The analysis of different ways of linking of smallholders to downstream segments draws upon economic theories of welfare and utility for smallholders on the one hand, and on transaction costs and vertical coordination for enterprises on the other hand. The basic assumption in this section is that any arrangement must ensure sufficient level of profits for them to willing to engage.

How does one define the welfare of an agricultural household? One can define it as the utility derived by the household given its income and the prices it
Because it is impossible to measure utility directly, a common proxy is the total income from on-farm and off-farm activities or profit since these increase the household’s well-being, all else held constant. However, the measurement of farm profits can be complex because of market imperfections and unobserved transactions costs. “Intuition suggests that contract farming should, at a minimum, increase the expected welfare of the households involved. If this were not the case, the assumption of individual rationality—the cornerstone of modern social science—dictates that they should refuse to participate in contract farming, just as it dictates that they should stop participating when these arrangements fail to increase their welfare” (Bellemare, 2012).

The transaction cost approach to the theory of the firm was first explained by Ronald Coase in his article "The Problem of Social Cost". It was used to explain the nature and limits of firms. Transaction cost theory was reintroduced and developed by Williamson who pointed out that “all cost differences between internal and market procurement ultimately rest on transaction cost considerations” (Williamson, 1981).

The transaction costs are costs of searching out one or more possible trade partners, informing them of the opportunity, and negotiating the terms of the exchange. All of these activities involve opportunity costs in terms of time, energy and money. Common transaction costs include the costs of search, screening, and transfer of goods, bargaining and enforcement.
According to Williamson cited by Dietrich (Dietrich, 1994) the determinants of transaction costs are information asymmetry, asset specificity, uncertainty, limited rationality, and opportunistic behavior. Each of these ideas is explain below.

- Information asymmetry and imperfect information prevent markets from operating efficiently. Because of imperfect information, sellers have to spend time finding potential buyers and negotiating over the price. Often the seller has more information about the quality of the product.

- Bounded rationality or limited ability to process information: Even if the buyer and seller had all the relevant information, they would not have the time or capacity to analyze it thoroughly.

- Opportunistic behavior or dishonesty: The buyer and seller can never fully trust each other, since each has some short-run incentive to misrepresent the truth and violate the terms of their agreement.

- Asset specificity or transaction-specific investments: The risks of opportunistic behavior are even greater when the buyer or seller must make investments that are only useful for carrying out a transaction with the other party. The greater the degree of asset specificity, the less likely it is that spot markets will be relied upon. Contractors will seek to negotiate contracts that protect their investment in face of external change.
According to Chen Ji (Chen, et al., 2012) “important empirical evidence provided by Shelanski and Klein (1995) supports the relationship between vertical integration and transaction cost, which involve the explanations of asset specificity and uncertainty”. Several other studies causally linked transaction costs to various forms of tight vertical coordination. All markets require some form of vertical coordination—that is, matching of supply and demand between different participants in the marketing channel, such as farmers, processors, wholesalers, and retailers (see Table 1). Minot and Poulton et al. (2004) cited by Tschirley (Tschirley, et al., 2009) suggest that in the real world, where the perfectly competitive ideal never fully holds, it
“becomes more likely that there will be some form of trade-off between competition and coordination.”

Table 1: Types of vertical coordination arrangements

<table>
<thead>
<tr>
<th>Types of vertical coordination arrangement</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spot markets</td>
<td>Sale transaction without relationship or prior agreement. Price is only “signal” for coordination.</td>
</tr>
<tr>
<td>Contract farming</td>
<td>Sale transaction based on prior agreement which may include technical assistance, inputs on credit, and/or guaranteed price.</td>
</tr>
<tr>
<td>Cooperative or joint venture</td>
<td>Sale transaction based on mutually owned enterprise.</td>
</tr>
<tr>
<td>Vertical integration</td>
<td>Two stages of market channel are merged into one company, e.g. sugar mill &amp; cane plantation.</td>
</tr>
</tbody>
</table>

2. **Background on vertical coordination**

“Vertical coordination encompasses all means of harmonizing vertically interdependent production and distribution activities, ranging from spot market through various types of contract to complete integration” (Stuart and Henderson). (See Figure 2.) The fundamental choice is between these two “ends” of the vertical coordination continuum: make versus buy. Vertical coordination is a concept that captures market, contacts, and ownership coordination. It recognizes that the profitability of activities at one level of a value chain (for example, milling) depends critically on decisions taken at other levels, such as the choice of variety of grain.
Figure 2: A Vertical Coordination Continuum

<table>
<thead>
<tr>
<th>Spot market</th>
<th>Relation only</th>
<th>Vertical integration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Specification</th>
<th>Equity-Based</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract</td>
<td>Alliance</td>
</tr>
</tbody>
</table>

**Source:** MSU-AEC-857. *Class material – East Lansing (2012)*

Table 2: Advantages and disadvantages of different arrangements for vertical coordination

<table>
<thead>
<tr>
<th>Types of vertical coordination</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spot markets</td>
<td>Less coordination cost</td>
<td>Difficult to coordinate quantity, quality, and timing of supply &amp; demand</td>
</tr>
<tr>
<td>Contract farming</td>
<td>Tighter linkage of supply &amp; demand leading to efficiency of small farmers</td>
<td>Higher cost than spot markets, looser coordination than vertical integration</td>
</tr>
<tr>
<td>Vertical integration</td>
<td>Very tight coordination</td>
<td>Wage labor less motivated &amp; more costly than family labor</td>
</tr>
</tbody>
</table>

**Source:** Nicholas Minot, IFPRI-2011 (Minot, 2011)

The agribusiness literature contains a number of studies of supply chain governance structure types in agriculture, and these studies have distinguished between the different kinds of coordination arrangements [Gulati (2005), Benfica (2006), (Gyau and Spiller, 2008), Minot (2011)]:

- **Open or spot market:** a market in which commodities are sold for cash and delivered immediately. It is an efficient market in the case of
perfect competition, providing economies in information. The intensity of 
coordination is low, and it is made ex ante. There are many potential 
advantages of spot market trading. It offers wide scope for flexibility 
and an easier way to negotiate an adjustment in price level.

- **Specification contracts**: a legally enforceable establishment of specific 
  and or detailed condition of exchange. The intensity of control increases 
  more than in the open market and may be ex ante and ex post through 
  monitoring contract execution. There are numerous ways to classify 
  contract farming schemes.

For Minot (2011) and Josh Bijman (2008), the most common dimensions of 
coordination arrangements made in contract farming schemes are:

- *the degree of formality* in the contract itself; contracts may be formal 
  (written) or informal (unwritten);

- *the types of commitments* made in the contract between buyer and 
  seller.

Mighell and Jones, cited by Minot (2011), classify contract farming 
schemes into three categories:

- A market-specifying contract, *which* describes the terms of the sales 
  transaction with regard to price, quantity, timing, and product attributes. 
  This type of contract makes sense when tight market coordination is 
  needed;
In a resource-providing contract, the buyer also provides agricultural inputs and technical assistance on credit. This type of contract is appropriate when the buyer has better access to credit and specialized inputs that are needed for production than farmers do.

The third type is the production-management contract, which specifies the manner in which the commodity is to be grown, such as the planting density, use of pesticides, and the timing of harvest. This type of contract makes sense when the buyer has more information about production methods or wants to ensure a level of quality or food safety. For example, the buyer may specify the types of pesticides that can be used and the timing of their application to ensure that pesticide residue standards are met.

A third dimension in contract farming is the way the price is determined and paid. There are three main methods, with some variation within each.

Fixed-price contracts - In some case, the price is fixed at planting time by the buyer. This has the advantage of reducing the risk to farmers, but it also leads to problems if the market price at harvest time diverges too much from the fixed price. It may lead to side-selling by the farmer, or the buyer may be tempted to purchase its supplies from the market rather than from the contracted farmers.
• Formula-price contracts - To avoid problems of side-selling, contract farming schemes sometimes rely on formula pricing, in which the buyer agrees to pay a price which is based on a market price, usually the market price plus a percentage premium.

• Split-payment contracts – In this system, the buyer makes two or more payments to the farmer. The first payment is usually a fixed price determined before planting, while the amount of the second payment varies depending on the sales price realized by the buyer. This system is often used by processor-exporters in the case of cotton and other export crops.

In addition to these types of contracts, the literature identifies other types of business agreements between farmers and processors, often termed “alliances.”

• Relation-only alliances: a kind of contract, a gentleman’s agreement, arising after a long a trustful exchange. It is an exchange relationship in which entities share risks and benefits emanating from mutually identified objectives. It is based on mutual control of the products ex ante and ex post.

• Equity-based alliances: These can be joint ventures, consortia, and cooperatives. The center of control is provided by a formal organizational structure that establishes policies and procedures to
conduct exchange between the parties. In Mali, equity-based alliances are most often cooperative enterprises, associations that can be formed by farmers, processors, wholesalers, retailers or exporters. For Staatz (1984), Zusman (1989), and Jaffee (1995), these members enter into implicit or explicit contracts with another.

Vertical integration (VI) is an alternative to two firms contracting with one another. VI is the creation of one organization that has control over the adjacent stages of production in a value chain and thus coordinates these stages internally within the firm. Often, VI is a result of merger or acquisition. Four major rationales underlie vertical integration:

- Production/logistical economies: VI may reduce logistical costs associated with the procurement of raw material and the sale of finished product;
- Transaction cost economies: VI can potentially save information costs and bargaining costs, if the costs of sharing information and reaching agreements within the firm are lower than those across firms (as the firm is the sole supplier to itself);
- Risk-bearing advantages: VI may be able to eliminate certain risks such as variability of supplies, outlets and quality and unauthorized use of technical information.
- Advantages in the presence of market imperfections: VI may minimize the effects of taxes and market controls.
However, large sunk costs in production facilities may bias the firm toward internal supply (Jaffee, 1995).

**Horizontal coordination or vertical integration:** To enhance profitability, smaller agro-industrial firms need to work together to match the scale advantages enjoyed by large businesses. Such horizontal coordination is frequently achieved through professional associations of millers, food processors or farmers through the provision of services to members—training, research, marketing assistance and political action—to harness market power through bulk purchasing of inputs or marketing economies in the sale of output. At the farm level, horizontal coordination takes the form of collective action by cooperatives, and in the case of agro-industries, by professional associations and sometimes by cartels.
Table 3. *Intensity of Control across the Vertical Coordination Continuum*

<table>
<thead>
<tr>
<th>Control intensity</th>
<th>Spot Market</th>
<th>Specification contract</th>
<th>Relation-only Alliance</th>
<th>Equity based Alliance</th>
<th>Vertical integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Mod. High</td>
<td>High</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Focus of control</th>
<th>Spot Market</th>
<th>Specification contract</th>
<th>Relation-only Alliance</th>
<th>Equity based Alliance</th>
<th>Vertical integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immediate transaction</td>
<td>Contract terms</td>
<td>Relationship</td>
<td>Property rights in joint entity</td>
<td>Property rights in full entity</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ex-ante control process</th>
<th>Spot Market</th>
<th>Specification contract</th>
<th>Relation-only Alliance</th>
<th>Equity based Alliance</th>
<th>Vertical integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price discovery options</td>
<td>Yes/no decision</td>
<td>Negotiating specification incentives</td>
<td>Building relationship informal parameters</td>
<td>Negotiating decentralized ex post governance structure</td>
<td>Negotiating centralized ex post governance structure</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ex-Post control process</th>
<th>Spot Market</th>
<th>Specification contract</th>
<th>Relation-only Alliance</th>
<th>Equity based Alliance</th>
<th>Vertical integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes/no decision to repeat transaction</td>
<td>Renew/renegotiate or seek third-party enforcement</td>
<td>Mutual resolution or dissolution</td>
<td>Execution of governance in the joint entity</td>
<td>Execution of governance in the full entity</td>
<td></td>
</tr>
</tbody>
</table>


Table 3 summarizes the intensity of controls (ex-ante and ex-post) across the vertical continuum. The control evolves from low in spot markets and reaches a higher level in vertical integration where at minimum two stages of the value chains are centralized by the same owner.
Figure 3 shows that: (i) it is economically justified to change vertical coordination arrangements only when the benefits of the new vertical coordination arrangement surpass the costs of establishing the new scheme; and (ii) the alternative vertical coordination arrangement is programmable and finally implementable. Otherwise the manager should abstain from changing the current coordination scheme.
3. **Economic and political environment factors**

Political and economic systems of different countries have a direct impact on the transactions costs, which in turn influence factors such as commodity characteristics in production and in processing/marketing that affect the vertical coordination arrangements that are chosen (as illustrated in the example of grain marketing arrangements in Kazakhstan discussed below in Chapter 4). Macroeconomic stability plays a fundamental role in the creation of an enabling business environment. Limited access to financing, high taxation, the corrupt judiciary system are the factors that continue to constitute the most significant obstacles to the operation and growth of firms in general (Benfica, et al., 2002). In spite of the progress achieved in reforms and legislation, lack of enforcement in the judiciary particularly affects land tenure, access to credit, the creation of producers’ groups, and foreign investment (Dideron, 2007).

Weak local governance may make vertical coordination more difficult, favoring individual smallholder arrangements (IS). It may also make it easier to accumulate large amounts of land for direct production VI arrangements. Contract farming (CF) arrangements, to be effective such that smallholders achieve economies of scale, are better fitted to an environment where communities are capable of getting organized in groups (coops, associations, etc.), which is not likely under an environment of
weak local governance, as it makes coordination more difficult—for example because of the weak ability to enforce contracts.

Our present study will assess, in the context of West Africa, what factors affect which of the vertical coordination arrangements by actors in different specific value chains, and why. Thus we will focus in the present paper on transaction costs and vertical coordination rather than welfare economics.

4. **Conditions under which contract farming makes sense**

Under what conditions will contract farming be profitable for both growers and buyers? Three factors appear to be most important: the type of buyer, the type of commodity, and the type of destination market (Minot, 2011).

- **Type of buyer:** The buyers in a contract farming scheme are more likely to be large-scale processors, exporters, or supermarket chains that are reaching for economies of scale. An advantage of larger-scale buyers is that they have access to capital, knowledge about production methods, and market information that farmers do not have. In addition, buyers with large capital-intensive processing plants have more incentive to contract with farmers because they need a steady and reliable flow of raw materials to maintain a high capacity-utilization rate.

- **Type of agricultural commodity:** Tighter vertical coordination is required for commodities with the following characteristics:
- Economically important quality variation—consumers are willing to pay a premium for a variety or attribute that will cover the additional cost of producing it and the cost of tighter vertical coordination. Farm-level investment in human capital (skills), physical capital (assets), or specialized inputs are required to raise quality.

- High value-bulk ratio—A given percentage premium for higher quality is more likely to cover the incremental cost of contracting if it is a high-value commodity.

- High perishability—Not all perishable goods are produced under contract, but perishability means that farmers and buyers need to coordinate the timing of harvest and delivery, thus increasing the incentive for some form of vertical coordination. In addition, a farmer’s bargaining power is seriously weakened once the product is harvested unless there is a contract relationship that ensures a fixed price or at least a personal relationship that ensures a fair price and an assured market outlet.

- Technically difficult production—If buyers can reduce the cost of production with technical expertise, specialized inputs, or credit, then contract farming is useful in transferring these resources to farmers. Farmers in developing countries may not have the liquidity to purchase inputs at planting time, so the contract allows
the buyer to provide inputs on credit and to recover the cost by deducting it from the payment to farmers at harvest.

- **Type of destination market:** The third factor is the destination market. The more quality-sensitive the final market and the more demand there is for food safety, the more incentive there is for tighter vertical coordination to increase control over the production process. The same commodity may be sold on the spot market for local rural consumers and grown under contract-farming schemes for upscale urban supermarkets and exporters.

### 5. Importance of vertical coordination in developing countries

Tighter vertical coordination (CF, VI) was widespread in state-controlled food supply chains although there were notoriously weak coordination in some cases, such as in the former Soviet Union. This reliance on non-market means of vertical coordination was most extreme in the communist and socialist systems where production at various stages and the exchange of inputs and outputs along the chain was coordinated and determined by the central command system. In other regions, as for example in Africa, the state played an important role in food chain vertical coordination. For example, many of the African parastatal organizations provided both inputs to farmers and purchased their outputs. In fact, state-controlled VC was often the only source of input and credit provision for peasant farmers.
parastatal cotton companies such as CMDT in Mali, SODECOTON in Cameroon and the Ghana Cotton Development Board in Ghana provided credit and inputs to cotton farmers (Poulton, 1998). In many SSA countries, state-controlled VC has been particularly important – and still remains important in some countries. The liberalization of exchange and prices and the privatization of farms and enterprises caused the collapse of parastatal vertical coordination and caused major disruptions in the value chain. Following privatization and liberalization, new forms of vertical coordination have emerged and are growing (IFAD, 2003; Swinnen, 2006; World Bank, 2005). New forms of vertical coordination are now provided by private institutions such as private traders, retailers, agribusinesses and food processing companies. These new forms of vertical coordination are in fact a private institutional response to market constraints in realizing high-quality, consistent supplies—for example financial constraints as well as difficulties in input markets and lack of technical and managerial capacity of smallholders. In developing countries, private sector-driven VC is emerging and growing in many sectors:

- The main crops that are grown under contractual arrangements in SSA include cotton, tobacco and horticultural crops.
- In South and Southeast Asia, there has been a sharp increase in tighter forms of VC of primary production with input suppliers and
processing/exporting firms during the past 20 years (Gulati and al., 2005). Especially in animal production and dairy farming, fruits and vegetables, tighter forms of VC are widespread.

- In Latin America, tighter forms of VC are widespread over many different agricultural commodities, including various contractual arrangements ranging from purely marketing contracts to production contracts with provision of inputs, credit, technical assistance and marketing assistance.

6. **The effects of emerging private-sector-driven VC**

The emergence of private-sector-driven VC is often mentioned by many authors as a new engine for economic growth, rural development and poverty reduction. Swinnen and Maertens (2007) have distinguished two effects of these new forms of VC: efficiency effects and equity effects.

The efficiency effect can be subdivided between direct impacts and indirect (spillover) effects.

**Direct effects:** Contracting farmers in developing countries can increase profit opportunities through a greater product range and differentiated products, or by diversifying out of traditional crops in order to grow high-value crops and increase their income (Williams, 1985; Levin, 1988; Korovkin, 1992; Glover, 1994; Von Braun & Immink, 1994; Kennedy, 1994;
Delgado, 1999; Coulter et al, 1999) cited by Johann Kirsten & Kurt Sartorius (2011)).

An IFPRI-FAO study finds that contract broiler farmers are significantly more efficient and produce higher profits than independent farms in the Philippines and Thailand (Gulati et al., 2005). Moreover, farm profits are higher through lower production and marketing costs for contract farms compared to independent smallholders in contract farming schemes for milk, broilers and fresh spinach in India (table 4).

**Table 4: Production and Transaction Cost of Milk, Broiler and Vegetable Production in Contract and Non-contract Farming in India (Rs/ton)**

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Contract Farming</th>
<th>Non-contract Farming</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Production cost</td>
<td>Transaction cost</td>
</tr>
<tr>
<td>Milk</td>
<td>5586</td>
<td>100</td>
</tr>
<tr>
<td>Broilers*</td>
<td>808</td>
<td>38</td>
</tr>
<tr>
<td>Spinach</td>
<td>1585</td>
<td>35</td>
</tr>
</tbody>
</table>

**Note:** *For broilers, the firm provides free chicks, feed and medicines to the contract farmers.*

**Source:** Birthal, Joshi and Gulati, 2005 cited by Miet Martens et al (2006)
Indirect effects: Frequently the literature points out that in addition to raising the incomes of growers, contract farming may also create positive multiplier effects for employment, infrastructure, and market development in the local economy, through cross-company and household and farm spillover effects. An illustrative example given by Swinnen et al. (2006) is the case of the Slovak sugar sector. One company introduced contracts to smallholders, and competition induced other sugar processors to introduce similar contracts. With some delay, this resulted in increases in productivity in the rest of the sugar sector. Other studies confirm the importance of this competition effect.

Household and farm spillovers occur when households’ risk reduces; their access to capital increases and the productivity of non-contracted activities increases. This results from the provision of inputs, working capital and technical assistance to farmers. In addition, credit arrangements and prompt cash payments after harvest in contract farming programs improves farmers’ cash flow and access to capital. As well, contract-farming can lead to productivity spillovers on other crops, resulting from management advice, access to improved technologies, better input use, etc. An illustrative example comes from Minten et al. (2006) on the fresh fruits and vegetable (FFV) sector in Madagascar, where the vast majority of FFV exports from Madagascar goes through one company. The company buys vegetables from more than 9,000 small farmers based on contracts. The firm provides seeds,
fertilizer and pesticides and engages in intensive monitoring and extension advice. The firm teaches farmers better technologies and management practices, such as the use of compost, and these results in productivity spillovers on rice, with yields being 64% higher for farmers under FFV-contract. In addition, smallholders who participate in contract-farming have higher welfare, more stable incomes and shorter lean periods (Maertens and Swinnen, 2006).

Many studies have examined the motivations of farmers to engage in contract production. Table 5 shows how the dominant motivation for farms in Central Europe at the end of the 1990s was guaranteed access to markets (52% of the farms listed this as their primary motive) and to a lesser extent guaranteed prices (21%). The motivation for small cotton farmers in southern Kazakhstan to enter into contracts with gins is mainly the improved access to credit (table 6)
Table 5. *Contract Motivations for Farms in Central Europe*

<table>
<thead>
<tr>
<th>Most important Reason for contracting (%)</th>
<th>Czech 1999</th>
<th>Slovak 1999</th>
<th>Hungary 1997</th>
</tr>
</thead>
<tbody>
<tr>
<td>Higher prices</td>
<td>9</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Stable prices</td>
<td>7</td>
<td>22</td>
<td>33</td>
</tr>
<tr>
<td>Guaranteed sales</td>
<td>64</td>
<td>50</td>
<td>43</td>
</tr>
<tr>
<td>Pre-payment</td>
<td>7</td>
<td>13</td>
<td>3</td>
</tr>
<tr>
<td>Access to credit</td>
<td>0</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>Access to input and assistance</td>
<td>7</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Others</td>
<td>6</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

*Source:* Swinnen, 2005

For FFV farmers in Senegal, guaranteed market access and access to inputs are the most important motivations to sign contracts, while in Madagascar income stability and shortening of the hungry season are most important (table 7).

Table 6. *Contract Motivations for Cotton Farms in Kazakhstan, 2003*

<table>
<thead>
<tr>
<th>Reason for contract (%)</th>
<th>Yes</th>
<th>No</th>
<th>Most important reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guaranteed product sales</td>
<td>9</td>
<td>91</td>
<td>8</td>
</tr>
<tr>
<td>Guaranteed price</td>
<td>4</td>
<td>96</td>
<td>3</td>
</tr>
<tr>
<td>Access to pre-financing</td>
<td>81</td>
<td>19</td>
<td>75</td>
</tr>
<tr>
<td>Access to inputs</td>
<td>11</td>
<td>86</td>
<td>10</td>
</tr>
<tr>
<td>Access to tech. assistance</td>
<td>0</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Others</td>
<td>4</td>
<td>96</td>
<td>3</td>
</tr>
</tbody>
</table>

*Source:* Swinnen, 2005
### Table 7: Contract Motivations for FFV farms in Senegal and Madagascar

<table>
<thead>
<tr>
<th>Reason for contracting (%)</th>
<th>Madagascar 2004</th>
<th>Senegal 2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stable income</td>
<td>66</td>
<td>30</td>
</tr>
<tr>
<td>Stable prices</td>
<td>19</td>
<td>45</td>
</tr>
<tr>
<td>Higher income</td>
<td>17</td>
<td>15</td>
</tr>
<tr>
<td>Higher prices</td>
<td>-</td>
<td>11</td>
</tr>
<tr>
<td>Guaranteed sales</td>
<td>-</td>
<td>66</td>
</tr>
<tr>
<td>Access to inputs &amp; credit</td>
<td>60</td>
<td>63</td>
</tr>
<tr>
<td>Access to technologies</td>
<td>55</td>
<td>17</td>
</tr>
<tr>
<td>Income during the “hungry season”</td>
<td>72</td>
<td>37</td>
</tr>
</tbody>
</table>

*Source: Minten et al., 2006; Maertens et al., 2006*

Equity (fairness) issues: Two potential equity issues can be found in various forms of contracting between farmers and downstream buyers: distribution of rents in vertically coordinated food supply chains and the participation or exclusion of smallholders and poorer farmers in contract-farming. In the case where the supplier (farmers / suppliers) and the coordinating firm (mostly food processors, exporters and retail chains) benefit, both parties share in the gains from the institutional innovation, and everybody is better off. However, if the coordinating firm can set the terms of the contract such that it captures most or all of the rents, the productivity growth may not benefit the farms; and interlinking may even bestow additional monopoly power upon the processing company.
“Contract farming in developing countries has experienced a mixed fortune, yielding some successes and many failures (cf. Little & Watts, 1994; Jaffee, 1994; Glover, 1984; Runsten & Key, 1996). Jaffee (1994), for example, talks of the ‘rocky road of contract farming in Kenya’” (Kirsten and Sartorius, 2002).

Contract-farming has often been criticized as being a tool for agro-industrial firms and food multinationals to exploit unequal power relationships with farmers and extract rents from the chain (Warning and Key, 2002).

“However, our review of empirical evidence on the effects of VC presented above indicates that farmers do share importantly in the benefits of contract-farming and VC” (Swinnen and Maertens, 2007).

A perennial problem with contract farming schemes is the high cost of dealing with large numbers of dispersed contract farmers. Sartorius and Kirsten (2004) argue that this is one of the main reasons that companies often prefer to work with larger-scale farmers. For companies, one solution is to have another organization act as intermediary between the company and the farmers such as a non-governmental organization (NGO) or a producers’ cooperative. According to Swinnen et al. (2007) and (Key and Runsten, 1999), there are three important reasons for why agro-industrial firms prefer to contract with wealthier farmers. First, transaction costs are lower for larger farms in supply chains. Second, when some amount of investment is needed in order to contract with or supply to the company,
small farms are often more constrained in their financial means for making necessary investments. Third, small farms typically require more assistance from the company per unit of output.

However, there are also reasons for why agro-industrial firms do contract with smallholders and poorer farmers. From Swinnen et al. there are three reasons why it is worth dealing with smallholders: i) companies have no choice in some cases; small farmers represent the vast majority of the potential supply base; ii) in some cases small farms may have substantive cost advantages, particularly in labor-intensive, high-maintenance-production activities with relatively small economies of scale; and iii) processors may prefer a mix of suppliers in order not to become too dependent on a few large suppliers. Another reason is to improve the image of the buyer with its customers, particularly higher-income consumers in the North that are interested in issues like “Fair Trade”, a movement which strives for fair treatment for farmers.

As with any form of contractual relationship, there are potential disadvantages and risks associated with contract farming. Common contractual problems include farmer sales to a buyer other than the one to whom the farmer is contracted (side selling) and a company's refusal to buy products at the agreed prices, or the downgrading of produce quality by the buyer. Most of the critiques against contract farming schemes make reference to the disadvantages to the farmers embedded in the contractual
arrangements such as farmers’ loss of autonomy, increased production risk, and increased market power of agribusiness. Another concern about contract farming arrangements is the potential for buyers to take advantage of farmers. They may sometimes use tactics to change pre-agreed standards, downgrading crops on delivery, thereby offering lower prices, or over-pricing for inputs and transport provided. Contracting often increases land-use intensity and can lead to higher levels of pollution (Key and Runsten, 1999). Furthermore, contract farming in developing countries can result in decreased food production and increased food security problems. This can happen when incentives for cash crops lead to the production of non-food, or secondary foods at the expense of main food crops. However this impact on food security is mixed, as farmers’ increased incomes can raise their economic access to food.
Chapter III: Research Hypothesis

The literature on New Institutional Economics and transaction costs suggests several hypotheses that we will examine, using our literature review to shed light on whether they are supported by empirical evidence. We expect the various forms of governance structures to differ in the terms of type of commodity/food, and market destination. We therefore hypothesize that:

**Hypothesis 1:** Economies of scale in processing characterizes the large scale technologies and creates strong incentives for stable supply of raw materials through more coordinated arrangements due to the need for processing plants to operate close to capacity in order to drive down their unit costs of production.

**Hypothesis 2:** Markets for perishable products will be more tightly coordinated than markets for storable commodities. Perishability increases the returns to tight vertical coordination and tends to discourage arrangements with independent small-scale farmers; thus Contract Farming (CF) and processing with Vertical integration (VI) arrangements are most favored.

**Hypothesis 3:** High quality standards increase returns to tighter vertical coordination and thus tend to discourage spot market transactions.

**Hypothesis 4** Export products need more coordination.
**Hypothesis 5**: The presence of many potential buyers implies that the costs and risks of default on cash or in-kind credit are high. Spot market transactions (IP) are most favored in these situations.

Table 18 summarizes how each factor affects transaction costs and its implications for the type of institutional arrangement likely to result.

**Table 8: Relationship between Transaction Cost Factors and Types of Institutional Arrangements Most Favored**

<table>
<thead>
<tr>
<th>Factors</th>
<th>Effect on Transactions Costs</th>
<th>IS</th>
<th>CF</th>
<th>VI</th>
</tr>
</thead>
<tbody>
<tr>
<td>High economies of scale in processing</td>
<td>Leads to the need for scale complementarity that creates strong incentives for stable supply of raw materials through more coordinated arrangements</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>High quality standards</td>
<td>Increases returns to close vertical coordination</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>High perishability</td>
<td>Increases the costs of not having a stable market. Increases returns to close vertical coordination</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Principal market is export</td>
<td>Tends to reduce number of buyers and risk of default in CF; quality standards usually higher; greater economies of scale</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Many potential buyers</td>
<td>Increases cost and risk of default in CF</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

NB. IS- individual smallholder; CF-contract farming; VI- vertical integration

Source: A selective synthesis of views from Minot (2011), (Delgado C. L., 1999), (Benfica, et al., 2002).
Chapter IV: Analytic Review of Selected Experiences around the World

The objective of this chapter is to use experiences throughout the world, especially in developing countries, to examine the hypotheses laid out in Chapter III. The chapter is organized in the light of hypotheses mentioned earlier. We will present in each topic the summary of the literature review about the given topic. For each marketing/processing characteristic such as economies of scale, high quality standards, perishability, export orientation, and the presence of many buyers for the product, we have made a literature review on developing countries. The transition countries, especially in Asia (East Asia, South Asia, and Central Asia) and Latin America (plus Caribbean) were taken as a model.

This review can help to identify potential lessons that can be learned and applied to the case of Mali. These disparate analogies point to a variety of mechanisms to improve market coordination by reducing transaction costs in different agricultural value chains.

1. Economies of scale

Economies of scale are more prevalent in processing plants and marketing firms. These entities need a certain quantity and quality of inputs to obtain a return on investment. Economies of scale are present at certain stages in the value chains of some traditional tropical products (sugar cane, coffee, tea, cocoa, rubber and oil palm). Some of them are grown on fully
integrated large-scale plantations or by smallholders. The scale economies do not necessarily occur at the farm-level, but may occur at other stages in the value chain or for specific operations in farming, such as spraying of cocoa trees, that can easily be contracted to others, such as specialized spraying services. Examples include cocoa in Cote d’Ivoire, Ghana and Nigeria; rubber in Malaysia, Nigeria and Sri Lanka, Liberia; coffee on the Ivory Coast, Kenya and Madagascar; oil-palm in West Africa and tea in Kenya and Malawi in Kenya. For example sugarcane mills are typically very large and need to spread deliveries over the season to maximize throughput. According to Nicholas Minot, there are two dominant forms of vertical coordination in sugar production: vertical integration and contract farming. In developing countries, these two forms are often combined in the form of a nucleus-estate with outgrowers. Typically, the processor provides assistance with land preparation, technical assistance, inputs, and harvesting, so that the contribution of the contract farmers is modest (Minot, 1986; Baumann, 2000; Sartorius and Kirsten, 2004) cited by Minot (2011)).

Scale economies involve also nearby several other stages in the vertical chain, such as a cold chain for handling perishable items. Another example is the export of cut flowers and vegetables, which tends to be characterized by economies of scale in marketing, requiring a cold chain for handling. How have developed and emerging developing countries achieved the linking of smallholders to downstream segments characterized by economies of scale?
Contract farming provides farmers with inputs, new technologies, credit and extension services, either private services or priority treatment from the public extension services as part of multipartite VC arrangements ((Bauman, 2000) and Minot, 2011).

2. **Perishable and high-value products:**

In the production of perishable and high-value products, contract farmers have taken advantage of new institutional arrangements that reduced costs (travel, transport of input and produce, access to information and new technology). Because of high transaction costs in the high-value agricultural sector, institutional coordination is a key of better deal for both buyer and seller (Gulati and al., 2005). Gulati gives examples of increased vertical coordination for high-value items in both South and Southeast Asia in the last 20 years. In table 4 (presented earlier), the transaction costs involved in milk and vegetable production were less under contract farming arrangements due to savings in time, transportation, and labor costs for marketing. In the broiler case, according to Swinnen (2007), although hardly any cost was incurred by the contract farmers for extension, communication and transportation for acquiring inputs were 80% of their total transaction costs in broiler production. The principal attraction for the broiler farmer in contracting was the availability of chicks, medicine and feed from the firm (Maertens and Swinnen, 2007). The shortage of quality input supply, which
is typical of transition countries, induces vertical coordination and spillover effects through farm support packages. Experiences with perishable and high-value products around the world show that the most efficient way of linking smallholders to retailers or processors is contract farming in general, and in developing countries, the most efficient approach involves resource-providing or production-management contracts that provide inputs (improved seed varieties, fertilizers and chemicals) and offer extension services or technical assistance on production methods (Maertens et al (2006); Minot (2011). In addition, smallholders engaged in such contracting should be empowered, i.e. organized in associations or cooperatives, for having more bargaining power and for avoiding the full power of downstream segment (Bijman and Wollni, 2008).

Boxes 1 and 2 show some examples of vertical coordination for perishable fresh fruits & vegetables and high quality standards products for dairy products in Asia by (Joshi, et al., 2007).
Box 1. Contract Farming for Fruits and Vegetables in India

Borthal et al. (2005), cited by Gulati (2007), report as follows:

“To meet the growing demand for fresh fruits and vegetables in the Delhi metropolitan area, a firm namely the Mother Dairy Fruit and Vegetables Limited (MDFVL) was established in 1988 as a subsidiary of the National Dairy Development Board (NDDB) that ushered milk revolution in India through the institution of cooperatives. Today, MDFVL with its 300 retail outlets is one of the biggest public sector undertakings in marketing of fresh fruits and vegetables in the world. It sells 250 tons of fresh fruits and vegetables to about 75,000 customers every day. MDFVL has set up a processing unit at Mumbai also and is in the process of establishing an auction market at Bangalore. The procurement operations of the firm are countrywide dictated by the regional production niches in specific commodities. Highly perishable commodities are procured from the areas surrounding Delhi, at present. The firm sources raw materials (fresh fruits and vegetables) from over 150 producers' associations, comprising 18,000 farmers.

These associations are informal cooperatives or self-help groups and are not governed by the State Cooperative Act. The MDFVL also sources its requirement directly from the non-members of these associations. It makes advanced estimates of seasonal demands for different fruits and vegetables and accordingly allocates the quantity to different associations. The MDFVL helps the association in area allocation, procurement of improved seed varieties, fertilizers and chemicals and offers extension services. It ties up with some reputed dealers for the supply of quality inputs to the producers at wholesale rates. The firm also arranges training programs for the farmers on good agronomic practices to increase production and minimize use of chemicals.

MDFVL has set quality standards for each fruit and vegetable. These are graded and priced as per laid out norms. The payment to the producers is made every fortnight through the association. A study on implications of contract farming has shown that contract farmers are attaining substantially higher (78 per cent) profits than non-contract farmers. This was mainly due to lower transactions costs (26 per cent) and higher procurement prices (5-20 per cent). The cost saving by smallholders is much higher (98 per cent) than that by large farmers (54 per cent). Higher profits and assured procurement of vegetables has resulted in expansion of the vegetable area by 76 per cent between 1990 and 2000.”
Box 2. Dairy Industry Development in India: Nestle shows the Way

Birthal et al. (2005), cited by Gulati (2007), report as follows: Nestle India Limited, concentrated in the northwestern state of Punjab, has been in the dairy business in India since early twentieth century. In the beginning it imported condensed milk and infant foods. In 1950s, the Government of India introduced a series of protectionist measures to regulate imports.

Nestle then had two options: to abandon the market or start local production. It chose the second option and established a milk-processing plant at Moga, a small town in Indian Punjab (India). On the very first day, it collected 510 kilograms of milk from 180 producers at four villages. In 1962, the company expanded its operations to 66 villages, covering 4,660 farmers and collected 2.0 million kilograms of milk. Over time the company made further expansion in its processing capacity and devised institutional mechanism of contract farming for a consistent supply. By 2001, the company started operating in 6 districts and could procure 236 million kilograms of milk from over 85,000 farmers from 1002 villages. At this point, the Nestlé’s share in total milk collection by the organized sector (cooperatives and private) in the state of Punjab, India, became around 17 per cent. It has a vast retail network of about 0.7 million outlets, covering 3,300 towns and serviced by over 4,000 distributors in India. Its important value added products are baby food, infant milk powder, dairy whiteners, sweetened condensed milk, ghee, UHT milk, curd and butter.

Nestle follows a two-fold strategy to source milk: (i) a tripartite contract, which involves the smallholders, company and the milk collection agents, and (ii) a direct legal agreement with producers having dairy herds of more than 25 milch animals. The buying price of milk is determined on the basis of fat and SNF (solid not fat) contents and payment is made every fortnight. The contractual arrangements reduced the transaction cost by 34 per cent, resulting in a higher profit to contract farmers by about 94 per cent. Under this arrangement, the smallholders gained more than the large farmers. The contract farming reduced the production cost by about 20 per cent for smallholders and 14 per cent for large farmers.”

Source: Birthal et al. (2005)

The content of the two boxes above enlighten us about the experience of India on the vertical coordination arrangements for perishable and high-quality-standard products.
There are many other studies about perishable and high-value commodities in the world that conclude that the best vertical coordination arrangements for such goods are the tighter ones: CF and VI. For example, in Asia, CF allows smallholders to benefit from inputs, extension and ensured outlet for their products ((Delgado C. L., 1999), Swinenn (2005-2007) and (Goel, 2011)).

In Latin America confirmation comes from a study by(Key and Runsten, 1999) about the frozen vegetable industry and from Michelson (2012) about supermarket supply by smallholders. This latter study found a mixed result from the local CF in the beginning (the prices were not as high as in wet markets), but it reassured smallholder against risks (Michelson, et al., 2012).

In SSA, studies from Minot (2011) about VC in bananas and FFV confirm that contract farming can be beneficial for both parties involved in this relationship on the one hand, and our previous hypothesis about tighter coordination in cases of perishability and high value standard products on the other hand.

3. **Presence of many buyers for the products**

Coarse grain value chains are typically characterized by the presence of many buyers, flexibility and greater ease in negotiating an adjustment in price, fewer potential hold-up problems with buyers, and more storable
products. Many studies from Swinnen cited by Warning & Key (2002) and Minot (2011) confirm that the presence of many buyers for products for local consumption (coarse grains, FFV) is likely to result in the products being sold on the spot market. However, in transition countries, there is extensive use of contract farming as a form of vertical coordination in these value chains.

In SSA, in contrast, spot markets are the typical vertical coordination arrangement because of the market destination (local market). However, for specialized uses where there is only a single or a few buyers, contracting is going on, for example, for cereals used by breweries. (In these cases, quality control issues by the buyer also influence the decision to move away from spot markets.) In Central Asia there are examples of large, vertically integrated grain companies as the dominant type of farming in the north of Kazakhstan (Maertens and Swinnen, 2006). In part, this may reflect path dependency given prior institutional arrangements in Kazakhstan (past history with a centrally planned economy). Prior to independence, Kazakhstan was one of the main exporters of cereals to the other Soviet republics (Babu, 2001), and Russia and other former republics continue to be primary export markets for Kazakhstan. That is a particularity for this northern part of Kazakhstan before the breakup of the USSR.

Thus, experience around the world tends to support our hypothesis, but with the exception of certain countries such as Kazakhstan and some other former counties from the ex USSR that have recently emerged from a long
history of central planning and where the products are largely destined for export markets.

4. Export products

The export market is characterized by issues of product quality, scale and the presence of frequently few buyers. The more quality-sensitive the final market and the more demand there is for food safety, the more incentive there is for vertical coordination to increase control over the production process. Gyau and Spiller (2008) even called for more coordinated supply chain governance structure for both exporters and importers to enhance their efficiency.

Export products involve high quality standards and often economies of scale in processing or in marketing. For these reasons, more coordination is typically used, mostly through resource-providing or production-management contracts and sometimes VI. For cotton as an export product, the dominant player in the chain for both transition countries and developing countries is the ginner, which typically contracts farms to supply seed cotton and provides them with a variety of inputs. This ginner supply-chain structure has developed in SSA countries as well as in Central Asia and involves quite extensive forms of private-sector led VC, with credit, seeds, irrigation, fertilizer, etc. being provided by the gins (Sadler, 2006). For
Peltzer, the contract-farming organization models for cotton sector provide “the best results” (Peltzer and Rottger, 2013).

The same commodity may be sold on the spot market for local, rural consumers and grown under contract farming schemes for upscale urban supermarkets and exporters. In Shandong Province, China, apples for export to Japan are grown on vertically integrated orchards/packing houses, whereas apples for sale to urban supermarkets are often grown under contract, while apples for local consumption are sold by farmers to wholesalers in spot markets (Hu 2005) cited by (Minot, 2011).

Another example is that processors and exporters often establish contract farming schemes to procure organic products, such as organic Basmati paddy in India, partly to ensure that organic methods are in fact used, while non-organic products are mostly sold in spot markets (Singh, 2008). These examples confirm the hypothesis that export products, because of their characteristics discussed above, typically need more coordination among the different actors of the value chains.
Table 9: Summary of Relationships between Transaction Cost Factors and Types of Institutional Arrangements Most Favored in the World

<table>
<thead>
<tr>
<th>Factors Marketing/processing characteristics</th>
<th>Type of Agro-Industrial Investment Favored(^1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IS</td>
</tr>
<tr>
<td>High economies of scale in processing</td>
<td></td>
</tr>
<tr>
<td>High quality standards</td>
<td></td>
</tr>
<tr>
<td>High perishability</td>
<td></td>
</tr>
<tr>
<td>Principal market is export</td>
<td></td>
</tr>
<tr>
<td>Many potential buyers(^2)</td>
<td>X</td>
</tr>
</tbody>
</table>

Table 9 summarizes the main findings of the literature review about vertical coordination in agribusiness in developing countries. It confirms our research hypothesis about vertical coordination, that is:

- Tighter vertical coordination is required for commodities with the following characteristics: large economies of scale in processing and/or/marketing; high quality standards; high perishability and export orientation.

\(^1\) IS=Processing with Independent smallholder producers; CF=Processing with Contract farming; VI=Vertical integration.

\(^2\) The movement away from IS is most important when the product is destined for export markets and in countries emerging from a history of central planning.
• Looser coordination is prevalent, as discussed above, if a product is homogeneous and nonperishable, if quality is easily observed, and if farmers are familiar with the production methods and market requirements, as these characteristics result in low transaction costs.

• The institutional arrangements are also influenced by a country’s past history. An example is the VI in wheat value chains in Central Asia. The case of Kazakhstan is an inheritance from the ex-USSR where there was a certain geographic distribution of industries among states.
Chapter V: Overview of the Situation of Linkages between Smallholders and Downstream Segments in Mali

The Malian agro-processing and marketing sectors reflect some diversity in terms of size, range of commodities, mechanisation, technology levels, and reliance on domestic and imported raw materials, internal and external market orientation, quality awareness, degrees of value addition and vertical and horizontal integration. The type of vertical coordination arrangements in agro-business is primarily a function of the sub-sector. Here we will focus on current arrangements by sub-sectors (food crops, perishable food products and non-food export products) such as rice, shea, sugar cane, mangoes, and cotton. However, some products have more than one characteristic (e.g., both export orientation and economies of scale) that may interact with our hypotheses.

1. **Economies of scale**

Involving mostly processing plants and marketing firms that need a certain quantity and quality of inputs to achieve a target rate of return on investment, large economies of scale in agribusiness are present traditionally in Mali mainly in the sugar industry, cereal milling, and cotton ginning. In this section we will examine the sugar sub-sector, reserving discussion of the cotton industry to a subsequent section examining export crops.
The economies of scale in sugar processing mean that sugar mills are typically fairly large. Sugarcane is highly perishable and must be delivered to the mill within 1-2 days of harvesting. Given the very low value-bulk ratio, sugarcane must be grown relatively close to the sugar mill to reduce transport costs. There are some economies of scale in milling, and the dominant form of vertical coordination in sugar production in Mali is vertical integration (where the mill and sugar plantation are owned by one company). This approach was adopted in the beginning of sugar plants in 1962, because sugarcane was not grown previously in Mali, so VI seemed to be the best way to link the production to the scale economy of production. Now there are three sugar processing plants, in Dougabougou, Siribala, and Bewani in the Segou Region, and all are using vertical integration for sugar production. A fourth planned plant, owned by the Shaffer Corporation and which has proposed an outgrower scheme has not yet started production and its future is uncertain.

Scale economies are also emerging in other sub-sectors of agro-processing plants in Mali such as rice milling. Because of the lack of standard quality of paddy (in part due to variation in post-harvest handling), rice millers are attempting to move away from spot markets for paddy to tighter forms of vertical coordination, including using plantation farming to supply their processing plants. An illustrative example is the acquisition of a lease for 7,400 ha of land in the Office du Niger in 2010 by the firm Grand
Distributeur Céréalier au Mali (GDCM-SA) to grow irrigated wheat, rice, maize and potatoes (Staatz and al., 2011). The general tendency about tighter coordination in industries characterized by economies of scale seems to be borne out in these two examples from Mali.

2. Perishable products

Fruits and vegetables that are destined for local consumption in unprocessed form are generally sold in traditional market channels (assembler-wholesaler-retailer) without contractual agreements. However, horticultural production for export often requires specific requirements in terms of quality, quantity, timing, or production methods which can only be met through a contractual relationship. Mangos are one of the best representatives of this sub-sector of perishable products in Mali.

Currently Mali is one of the largest producers of mangoes in SSA, and Malian mangoes have a good reputation internationally. The production is estimated at 500,000 MT, albeit much of that total includes less popular varieties of the fruit. “There is very little value addition to the mango crop. Mali produces no mango pulp and exports only about 10,000 MT/yr of its fresh mangoes, and the prices for fresh mangoes in the local Malian markets during the high season are barely remunerative” (Keturakis, 2009). Nearby seventy-five percent of this production is consumed on or near the farm, and a fraction is then processed using traditional technologies. Industrial processing is
nonexistent, while mango pulp production is technically and financially feasible Keturakis (2009). The process is relatively simple, involving seven basic steps; washing, destoning, thermal treatment, homogenization, deaeration, pasteurization and packaging. There is a 12–40% profit margin in mango pulp production for the export market, depending on the scenario used. Under nearly any scenario, a mango pulp production facility appears to be profitable (Keturakis, 2009). Mangoes are rapidly becoming a mainstream fruit. As evidence, the world export of mangoes more than doubled between 1996 and 2005, going from 397,000 MT to 826,000 MT. The International Trade Commission estimates the world demand for mango pulp in 2008 at 383,000 MT, an increase in demand of almost 40% since 2003 (Keturakis, 2009).

Mali has exported mangoes for many years to the European Union (France, Netherlands, United Kingdom, Germany, and Belgium) and to neighboring countries such as Côte d’Ivoire, Senegal and Mauritania, and also exports to the Arab countries. There are only a few conditioning units including in Sikasso and Bamako (ovens for drying mangoes), and this deficiency causes great harm to the export of Malian mangoes. Moreover, many of Mali’s mangoes are shipped to Cote d’Ivoire and are subsequently re-exported as Ivorian fruit (Diarra, 2010). Although the export market has experienced impressive growth, it represents less than 2% of total Malian mango production. There is a strong need develop new value chains that satisfy
domestic and regional markets for fresh fruit and, more importantly, for processes fruits such as dried fruit, juice and preserves (Staatz and al., 2011).

Mangoes are produced in small orchards all over the Sudanian zone in Mali. It is a perishable product, thus if it is not preserved by appropriate technology after picking it deteriorates very quickly. The distribution of mangoes at the local level is exclusively done by the informal sector in spot markets. As for exports, the actors are organized in cooperatives, associations or limited liability companies that have business partners abroad. In this case, some forms of contract often link smallholders of these export partners. These contracts are often informal and based mainly on relation only-alliances, with in some cases a resource-providing contract or production-management contract relation (supply and extension regarding pesticide use) being used.

Other perishable products include vegetables that are usually consumed locally and sold in the spot markets. Tomatoes are produced in large quantities as a dry-season crop in the Office du Niger, but due to the lack of preservation technique, they are sold off or simply rot when they could be transformed to the benefit of producers and why not the whole society? This sub-sector deserves to be reviewed and corrected, i.e. to look for better ways of linking producers to downstream segments. However, for export vegetables such as French green beans, there are tighter contracts, mainly
management-contract linkages between exporters and smallholders for being able to satisfy the standard requirements.

In summary, for perishable products in Mali, the result of our review shows a mixed pattern, with coordination much tighter with products destined for export, and less in the local market.

3. High quality standards

Shea can be taken as an example of a product facing high quality standards for export. Mali has the largest population of African shea trees, approximately 2/3 of all shea trees in the world (Programme de Compétitivité et de Diversification Agricole: PCDA, 2004). There are no statistical data establishing the precise amount of nuts produced in Mali because the industry is largely managed by the informal sector. However, referring to various sources, we can estimate the quantities currently used between 80 000 and 100 000 tons per year (Programme de Compétitivité et de Diversification Agricole: PCDA, 2004), (Perakis, 2009). Preliminary collection and processing of shea nuts are traditionally performed by women. The industrial processing is done by a limited number of companies such as SHEA-HUICOMA, whose production is around 5000 tons per year. The supply chains actors are driven by producers (generally women who gather shea nuts for traditional processing or for resale), vendors, collectors, retailers from rural areas and urban wholesalers. Mali has thousands of traders and
about 20 wholesalers according to Perakis (2009). The market is supplied
differently throughout the year by various actors, mainly through spot
markets or relation-only alliances. Some written and unwritten contracts are
made by few cooperatives or associations (usually helped by NGOs) and
exporters. Since the mid-2000s, global demand for shea butter (the oil
extract from the shea nut) has increased dramatically following the decision
of the European Union to allow up to 5 per cent substitution of shea butter
as a cocoa butter equivalent in chocolate and the increased incorporation of
shea butter in women’s cosmetics in industrialized countries.

In response to the structure of the Malian shea value chain, some
cooperatives were established. Their roles include:

- Vertical integration over several stages such as gathering, processing,
  and retailing through associations, Groupement d’Interet Economique
  (GIE) or cooperatives. Vertical integration (disintermediation) occurs
  when cooperatives take up one or more upstream or downstream
  activities, ruling out middlemen and potentially increasing returns to
  production (Perakis, 2009).

- Monitoring and quality-assurance, thereby reducing information
  asymmetry and incentives to cheat. Some of these organizations test
  the chemical composition of their products in laboratories overseas
  and use the quality certificate as a signal to command a premium for
  quality.
• Improving bargaining power and economies of size in pooled marketing and,
• Improving access to credit, production inputs, and capital.

There are several marketing channels in the Malian shea value chain linking individual producers, cooperatives, and traders to exporters. In terms of marketing and export, the basic nuts marketed are exported via the European Union and Japan. The exporters are grouped together in an organization called the Malian Association of Exporters of Gathered Products (AMEPROC). Some producer groups attempted to adopt improved processing methods, but reverted back to their labor-saving production practices because they were not financially remunerated for their efforts (Perakis, 2009).

The main constraints that relate to the governance regarding transformation and marketing of the sub-sector are:

• Weak vertical coordination of industry players, resulting in the existence of many intermediaries. Shea products change hands many times before arriving in major cities.
• The lack of certification of products; this lack results in the absence of price premium payments for higher-quality nuts and shea butter and causes difficulties in exporting the products;
• Inadequate preserving and processing technologies, which is why foreign oilseed firms prefer to import whole shea nuts, precluding primary producers from earning additional profits from their value-added commodities.

However, according to the theories we reviewed earlier in this study, we would expect there to be tighter coordination in the shea value chain, given its sensitivity to quality standards. Reasons for the weak vertical coordination may be explained by lack of quality checking instruments, which contributes to the asymmetric information about quality. In addition, the production of small quantities by individual sellers leads traders to pool nuts from many different sources in the early stages of the marketing process, leading to mixing of many different qualities of products in the supply chain. Women therefore have no incentive to improve nut quality and oil quality if they are not receiving a price premium for their efforts. The low prices paid by traders due to the levels of information asymmetry. The nut price in Abidjan is 65 FCFA for the Malian nuts, and 100 FCFA for nuts coming from Burkina Faso, while shea butter price is 425 F CFA in Abidjan (Yiriwa Conseil, 2001). The Burkinabe overcame this problem by improving the quality of their products, achieved via widespread information dissemination to women’s processing groups, the encouragement of separation of product by quality in the marketing system, and complementary price premiums (Perakis, 2009).
Gum arabic is also considered as a high-standard product. There is little information on this industry. Mali is considered a major producer of gum arabic, but this is a sector that has received little support from the authorities despite the existence of a significant export demand. In Mali gum production comes mainly from natural stands, the most important of which are in the Sahel. The production potential is currently estimated at between 10,000 and 13,000 tons. Although there are no reliable data, the information available shows that the current production of gum is very small compared to the potential (Programme de Compétitivité et de Diversification Agricole: PCDA, 2004). Several operators are involved in the commercialization of gum, so the marketing channels for gum are very long with many intermediaries:

- The collectors, who are also producers,
- The village-based traders in the areas of production,
- Collectors and traders going from village to village,
- Large collectors trading collected gum and usually installed in major centers like Kayes, Nioro, Mopti, and Bamako. They collect gum from villager collectors and trader collectors and finally,
- Exporters are usually big collectors or wholesalers. They are responsible for seeking contracts from foreign importers, and must condition the gum to make it comply with the requirements of the international market.
Limitations of the Malian gum arabic industry include:

- Poor quality of products due to the presence of many wastes and poor conservation conditions, causing strong agglutination.
- Poor marketing organization, which produces a short supply compared to the demand of the importers in the local market.
- Lack of information, resulting in difficulties to honor delivery contracts in terms of price and time.
- An irregular supply that varies each year depending on the quantities required by the intermediaries and prices offered to producers.
- Many intermediaries between producers and exporters.
- Poor training, information and organization of actors, lack of strong organizational actors to address the problems of the sector.

We can see, as with shea nuts and shea oil, gum arabic, a high-standard product contradicts our hypothesis formulated above. This is due very likely to asymmetric information about the product quality in Mali resulting in the low price paid to producers/collectors. Investing in intermediary institutions can reduce the cost and the quality of the gum. Low market trust and reputation accorded to undifferentiated output when true quality is unknown by the buyer at the time of trade makes the smallholders’ output price low (Gulati and al., 2007).
3. Products with many potential buyers

Cereals such as rice, millet and sorghum are the most widely consumed foodstuffs in Mali, and are thus widely bought by the population in markets, especially in spot markets. Here we will use rice as an example product with many potential buyers. The rice subsector alone contributes about 5 percent of Malian GDP (Diarra, 2010). Its share in value added has increased with the intensification of trade flows to urban areas. Compared to the livestock and cotton industries, whose development is linked to exports, the rice sector has the merit of having a growing domestic market. The sub-sector is supported by several government regional efforts, known as “offices” (Office du Niger, Office de périmètre irrigué de Baguinéda, Office Riz Ségou, Office Riz Mopti, Office de développement rural de Sélénégué, etc.). In these basins, the actors are organized in associations or cooperatives. The paddy production is hulled; part of it is intended for home consumption and the surplus is sold in spot markets. This market is structured on two levels: local traders who act as intermediaries between producers and wholesalers in urban areas and traders in urban areas who pass directly through cooperatives or producers to get their supply. Flows and marketing systems differ depending on the rice farming system considered. Thus, outside the area of the Office du Niger (ON), rice production is primarily for home consumption. The surplus volumes marketed vary from one year to another as a function of the liquidity needs of producers who must pay their
production expenses and any outstanding loans they have taken. For the ON area, the existence of surplus and an urban market (both growing) has greatly facilitated the establishment of a private marketing system, which has been quickly effective since the market liberalization.

Marketing is still informal with numerous transactions in cash. Recourse to bank credit is limited, except at the end of the chain to large traders and millers. The wholesale system for domestically produced rice is mainly based upon production in the ON zone, with traders based in Niono-Macina and Bamako and supplied by a large number of intermediates often playing multiple roles in the chain: for example, farmers can be small processors and traders at the same time.

We are increasingly observing the emergence of VI in the rice sub-sector. This is due to the fact that large processing plants have not succeeded in finding the paddy of the quality needed. Thus, we are beginning to see the acquisition of leases in the ON by groups like milling company Grand Distributeur de Cereales du Mali (GDCM) (Staatz and al., 2011). This contradicts somewhat our prediction that storable commodities with many buyers will likely rely more on spot markets. Actually rice is sold mainly on spot markets, but larger processors cannot find paddy that meets their required processing standards, so they try to rely more on vertical integration. Another factor is the increasing demand by the emerging middle
class in Mali for consistent quality milled rice. That makes rice sometimes a high-quality product.

In the Malian context, vertical coordination takes place mainly through spot markets given the low level of assets of most actors and the prevalence of medium to smaller business sizes. The improvement of the coordination between smallholders and processors/retailers is a great challenge for Malian agriculture. This requires further involvement of central government and local authorities by providing facilitation for better coordination by private actors (farmers, processors, wholesalers, retailers) on the one hand, and cooperation between these groups with the public sector on the other hand. For example, government can facilitate the creation of value-chain boards, councils, or “interprofessions” involving all participants of the value chains. The latter are joint-analysis and problem-solving planning organizations, composed of a broad spectrum of key participants in a specific value chain from input suppliers, farmers, traders, marketers, processors, exporters, government officials, to even research institutes (Staatz and Ricks, 2010). The capturing of a larger share of the burgeoning urban markets for higher-quality rice will require better coordination between farmers and millers to improve post-harvest handling of paddy to ensure better milling outcomes.
4. **Export products**

Cotton is the main agricultural export product in Mali. The cotton industry is of strategic importance because of its strong contribution to the national GDP: 5-8% of GDP and 5-10 billion FCFA (US $ 10-20 Million) of direct taxes (Samake and al., 2008), the large share of the population directly concerned, and its social impact in terms of farm incomes and the fight against poverty. Producers, organized into village associations or cooperatives, sell their seed cotton directly to the CMDT, which is in charge of ginning. The performance of the current market structure is characterized by a single buyer (CMDT), which is undergoing restructuring and is in bad financial shape. This market structure raises concern among some authors about the benefit of smallholders participating in contract farming, and being exposed to risks of where buyers are “monopsonistic or oligopsonistic” (Barrett and et al., 2012) and thus enjoy contractual bargaining power over farmers that may permit firms to extract most of the gains from trade. When it comes to the contract between CMDT and the farmers, it is an unwritten relation-only alliance combined with a resource-providing contract. CMDT provides cotton seed, fertilizer, pesticides, and extension service to the farmers. The pricing for the output is in the form of split-payment contracts with a fixed price determined before planting, while the amount of the second payment varies depending on the sales price realized by the buyer on the international market. Although reasonably successful in the past by
respecting its commitments towards farmers, the lack of competition led to increasing inefficiencies. In addition, the lack of transparency evolved to rent-seeking and corruption, and when world cotton prices fell in the late 1980s and early 1990s, CMDT, a state enterprise entered bankruptcy (Tschirley, et al., 2009). During the 1980s and 1990s, economic reforms led to the liberalization of cotton seed processing and attempts to privatize the cotton enterprises (Minot, 2011). Here the hypothesis put forward earlier is verified about the tighter vertical coordination in an export-oriented value chain.
Table 10: Summary of the Relationship between Transaction Cost Factors and Types of Institutional Arrangements Most Favored in Mali

<table>
<thead>
<tr>
<th>Type of Product</th>
<th>Destination</th>
<th>Minimum Coordination (spot market)</th>
<th>Contract Specification</th>
<th>Contract Res. Providing</th>
<th>Vertical Integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>High economies of scale in processing <strong>Sugarcane</strong></td>
<td>Domestic</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>High quality standards <strong>Shea</strong></td>
<td>Domestic</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Export</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High perishability <strong>Mangoes</strong></td>
<td>Domestic</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Export</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Principal market is export <strong>Cotton</strong></td>
<td>Export</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Many potential buyers <strong>Rice</strong></td>
<td>Domestic</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Export</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Table 10 shows the different vertical coordination arrangements found in selected value chains in Mali corresponding to the different crop/destination markets. We inserted the domestic and export markets to clarify the distinction between these two kinds of markets. One can notice that weak
coordination dominates in the agribusiness sector in Mali and especially in the domestic market. VI in the sugar cane sub-sector is an exception because sugarcane cannot grow in this zone without irrigation that smallholders are not able to afford. Even with high quality standards that apply to some export crops, there is frequently weak vertical coordination. This explains why producers of shea, in general women, suffer because of this inefficiency. Also for the export of mangoes the coordination is poor. Buyers merely make known the demand for different varieties and the standards about pesticide use. As for rice, the tendency is changing, with larger paddy processors entering in vertical integration because of the lack of desired quality of the raw material.

So, what are the strengths and weaknesses of the linkages of smallholders to downstream value added segments in Mali?

For strengths:

- The cotton sub-sector represents decided progress of vertical coordination in agribusiness in Mali, although it may be upgraded. It uses the contract farming, with resource-providing and resource-management contracts with a split-payment that allows farmers to receive a price consistent with the world market price.
• In addition, the entrance of new processors in the rice sub-sector via vertical integration to meet quality standards requirements will improve rural employment.

• VI in the sugar industry allows a large rural work force to be employed in this area.

However, there are many deficiencies in vertical coordination such as:

• The lack of coordination in the other sub-sectors such as high-value commodities and perishable products,

• Weak coordination for most commodities used locally,

• Inadequate coordination for coarse grains for processing,

• The actors of the different value chains are often not well organized and are mostly illiterate.

This situation testifies that smallholders do not gain the potential benefit from this market. They are not linked to downstream value-added segments, so they are using spot markets. This situation is also detrimental to downstream segments. Processors and retailers cannot rely on spot markets to have high quality standard products; it is why some of them are trying to vertically integrate into farm-level production, which can be costly.
Chapter VI: Conclusions and Policy Recommendations

1. Summary of key results

The objective of this study was to assess the strengths and weaknesses of alternative models of linking smallholders to downstream value-added activities in Mali. To do so, this study first focused on NIE to formulate hypotheses about vertical coordination in the light of transaction costs and product characteristics. After that, we focused on a literature review about the linkage of smallholders to downstream value-added segments, especially to processors/wholesalers/retailers, in countries around the world but especially in developing countries. The aim was to draw lessons about the best ways to link different actors in different sub-sectors in agribusiness. Moreover, the study describes the situation of vertical coordination in agribusiness in Mali regarding specific products. Finally, suggestions and recommendations are given to enhance the vertical coordination for the benefit of both suppliers and demanders.

The literature review has clearly revealed that strengthening farm-firm linkages through new institutional arrangements can be mutually beneficial for both producers and firms. Although contract farming is sometimes criticized, it is not the contract per se that is harmful as a system, but how it is practiced in a given context. If contracts are well designed and implemented, they can be mutually beneficial for all parties involved,
especially farmers. This mutual benefit is possible under certain conditions including a strong commitment by government in favor of policy reforms that help the interconnection of smallholders and downstream segments of agribusiness, and investment in infrastructure and extension services. Despite a potential substantial reduction in transaction costs and improvement in marketing efficiency, such farm-firm linkage models replicate at a very slow rate in Mali.

In addition, the study confirms our preliminary hypotheses about the relationship between commodity characteristics and vertical coordination. On the one hand, in general the greater value, perishability, and production skills required for the commodity, the tighter will be the vertical coordination. On the other hand, the lesser value, production skills, and more storable is a product, the looser will be the vertical coordination.

Furthermore, this study found that vertical coordination in agribusiness in Mali is weak. Except for the cotton and sugar sub-sectors, most value chains rely on spot markets for coordination among farmers, processors, wholesalers, and retailers. Even with perishable and high value products targeted for export, the coordination is poor.

Because of the weak coordination between production and the market, smallholders in Mali do not benefit fully from their outputs and so are enable to improve productivity and livelihood.
2. **Contributions and limitations of the study**

This study has examined different experiences of linkage between smallholders and processors/retailers in developing countries in the area of agribusiness. It has provided an overview of the linkage between small-scale farmers and downstream segments in Mali regarding agricultural outputs and has provided a baseline view for further works in this area. The major contributions are:

- **Understanding the market coordination system under which Malian agribusiness actors evolve, specifically, the dominance of the traditional sector at both wholesale and retail levels.**

- **Documenting the inadequate coordination in the local market for all agricultural outputs, except for the sugar subsector. Even with export products the coordination is weak.**

A limitation of this study is that the review focuses on the willingness of downstream segments to make a deal with smallholders and not the willingness of smallholders to commit to such contracting up the value chain. Moreover, the study focused on marketing/processing/retailing factors, but did not deal with production factors. For example limited access to land, input factors and capital may play important role in decisions to adopt tighter VC arrangements.
3. Future research

This paper is a literature review of the experiences of linkage between smallholders with downstream value added segments in agribusiness in developing countries. It would be useful to have more empirical data about this coordination in Mali. Nowadays in Mali, more detailed information about vertical coordination in the rice, tomato and mango value chains would be useful for the Malian agribusiness in general. Further studies may focus on (i) why coordination problem exist in Mali. (ii) how to increase the linkage between actors in different sub-sectors for reducing waste of perishable and high value products and improving the profitability for both smallholders and processors/retailers, (iii) what factors can inhibit smallholder farmers from contracting, and (IV) estimate the cost of improvement.

4. Policy implications and recommendations

- Lessons from leading developing countries

Policies to promote trade, including lower tariff barriers, market-determined exchange rates, and deregulation of international trade have created opportunities for developing countries to export agricultural commodities, both to high-income countries and to other developing countries (Roepstorff and Wiggins, 2011). The lowering of import barriers in developed countries has probably facilitated the growth of high-value exports such as fish and seafood products.
Governments in many Asian countries have shown strong political commitment to small-farm-led agricultural development that involves broad components such as: (i) the policy and regulatory environment under which the system operates; and (ii) the availability of basic infrastructure including power, communication, water and transportation.

The five largest emerging markets (China, India, Indonesia, Brazil and Russia) have recorded impressive growth rates while increasing market shares in world trade, export value added and trade-to-GDP ratios (Roepstorff and Wiggins, 2011). For policy reforms, all five countries have opened up and restructured their economies along market-oriented lines and, in the process, improved their linkages to global trade networks (Henneberry 2009) cited by Wiggins (2011).

As for investments, they involved agro-industrial research and extension services for large-scale adoption of improved seed varieties and fertilizer (Unnevehr, 2000). Thus, the market liberalization and pricing policy reforms in emerging markets helped boost agricultural productivity. For example, China’s approach encouraged comparative advantages for the expansion of labor-intensive enterprises as well as productivity in other sectors, manufacturing clothing, shoes and wooden products) that were in line with its relative factor endowments.
Foreign direct investments also enabled some countries like Brazil to increase the participation of large, private agribusinesses.

These kinds of broad policy reforms that improve the general business climate are very important for the situation in Mali. The lack of tighter VC seen in many Malian value chains is due in part to the lack of such a facilitating environment, particularly the presence in Mali of problems of contract enforcement and risk-sharing. As stated by Thapa (2009), “Governments can support small farmers through policy interventions that create an conductive economic environment for market-led development, and by providing stable economic incentives and necessary public goods and services”.

There are many policy and infrastructure obstacles in developing new institutional arrangements in the context of Mali.

First, coordination in agribusiness comes primarily from downstream segments such as agro processors and wholesalers/retailers, so government policy should stimulate the participation of the private sector in agribusiness. A better macroeconomic environment reducing bureaucracy and corruption in the administration may contribute to attaining this objective. That stimulates, for example, justice for contract enforcement, reduction of inopportune roadblocks (non-tariff barriers) and demands of bribes at borders. Another obstacle to remove is inappropriate taxes such as the 15%
tax on financial activities (TAF). This is a real obstacle to industrial development that has been decried by the OPI (Organisation Patronale des Industriels—Industrial Employers Organization). The tax covers all operations and all conventional bank loan transactions, even input credit. The taxation of interest in both operations is a feature that can penalize Malian banking. Removing this tax may help to create an investment climate that facilitates private investment and attracts foreign investors; both are usually organized by large-scale processors and exporters.

In addition to improving the overall business environment in Mali, greater attention must be given to policies and programs to support the development of agro industry and food processing in particular, because these are labor-intensive and generate higher value added. Specifically, the costs of main factors of production used in agro processing such as electricity, communication, and transportation, are expensive in Mali relative to neighboring countries. This discourages foreign investors, who usually set manufacturing plants in neighboring countries, where these costs factors are less. The high cost of factors is mainly due to the mismanagement of these state-controlled enterprises and a lack of competition in some of these sectors.

The Malian government should encourage the hiring of educated skilled graduates, in the agrifood system, using incentives to private sectors for solving the deficiency of literate businessmen in these value chains.
Public/private partnerships may lead to collaborations between public authorities, non-governmental organizations, and private companies, setting up “interprofessions”, research, and extension programs on the one hand and grades and standards and methods of certification on the other hand. Together the involved actors should be able to identify reliable trading partners across borders, meet their quality requirements and complete requirements of trading across borders. The partnership must also facilitate looking for better ways for mediation and contract enforcement.

For example, tomatoes can be produced the whole year with the availability of irrigation, especially in ON area. However, looking for possible transformation in situ to sauce or tomato paste for local consumption should be undertaken. Above all, organizing extension workshops for better preserving tomatoes would be helpful for tomato producers.

In addition, agricultural policy should focus on identifying critical areas for trade and marketing, that can facilitate the integration of smallholders to the growing local and global market, such as finding a niche in the market for local products. Value addition does involve processing in the sense that the product undergoes some process (which can just involve cleaning, grading, or labeling), after which a buyer is willing to pay a price for the product that more than compensates for the cost of the inputs used in the process (Roepstorff and Wiggins, 2011).
Regional trade also offers an opportunity for Malian farmers to benefit from product differentiation given diversity in regional demand. For example, cleaning and sorting rice into long grain and broken rice can have a great value for the regional market. The Senegalese market demands broken rice, whereas the Ivory Coast market prefers long grain. The same practice is valid for mangoes in the local and export market. High quality can be sorted for targeting export fruits markets, and lower-quality can be targeted for juice and local consumption.

Moreover, the existing research shows that empowering producers, especially smallholders, in the areas of commodity production enable them to escape from subsistence agriculture and look for market intended purpose. For Reynolds (1985) cited by (Staatz, 2011), structural transformation in SSA must lead to a reorientation of the economy away from subsistence-oriented, to integrated economy based on greater specialization, exchange and capturing of economies of scale.

Incentives transmission to farmers/ producers is useful for meeting quality requirements, especially high value commodities and even rice. In order to meet this recommendation, first, actions should be undertaken to increase the amount of marketed surplus produced per farmer or per village association (IF the association keeps the different qualities separate). Needed actions include, for example, careful drying and storage of paddy to ensure better processing outcomes; improved systems for paddy
aggregation and assured delivery to processors; and improvements in wholesaling, packaging and marketing of the milled rice. That “lack of consistent quality in milled rice is a major constraint to West African producers capturing a larger share of the market currently supplied by imports” (Roepstorff and Wiggins, 2011). The second action should be working with traders to try to get them to keep the different qualities separate within the marketing system.

For enhancing agricultural productivity, further efforts are necessary to make available timely inputs (improved seeds, fertilizer, and pesticide) and extension services may improve productivity and competitiveness. Typical examples here are training about standards in shea and gum arabic sub sectors. Another important factor of this structural transformation is the empowering of smallholders’ organizations for participation in vertical integration. Key actions could include strengthening management training and trying to inculcate a culture of democratic leadership.

Moreover, policy makers have the responsibility to look for promoting innovative financing for producers in general and especially for smallholders. Investment in agriculture in Mali is not easy, because there are no long-term loans above five years. So investing in orchards, irrigation or livestock breeding is impossible with the current banking system, even with the National Agricultural Development Bank (BNDA). Furthermore, the interest rate for any other investments for 3-5 years is very high (14-24%/year).
Policymakers do well like cautious about responding to requests from agribusiness firms for a regional monopoly, favoring instead competition among firms such as in the cotton and sugarcane subsectors. Competition is very important in supply chains for equity and efficiency. First, competition induces VC spillover effects across the sector; second, it prevents processing companies or input suppliers from exercising monopoly power in setting contract conditions with farms. Competition among cotton gins in Kazakhstan allowed small suppliers to get better conditions by changing gins, induced investment by gins in local cotton seed collection centers reducing farm transport costs, and led to better prices (Swinnen and Maertens, 2007).

Finally, improving infrastructure and energy access is a powerful factor boosting agricultural production and agro processing. These infrastructures affecting agro-industry are: transport capacity, access to energy and ICT systems, rural roads, irrigation facilities to secure production in the Sahel zone, warehouse facilities, storage and cold facilities. Rural infrastructure is a serious constraint on VC, and particularly for integrating small producers in remote areas. They need lower transport costs through improvements of rural infrastructure. The lack of cheap electricity inhibits processing in ON zone.

The government, in its quest for poverty reduction, may develop policies to exercise appropriate vertical coordination, namely: to support smallholders
in spot markets, either as individual farmers or organized groups, contract farming models, which may include provision of inputs, advisory services, and fixed prices before seeding, and large-scale farming that generates employment. The least the government can do is to create conditions for better organization of private agribusiness sectors to be the engine of economic development in Mali.

Currently, Mali is facing a critical moment of its history. The Malian Northern Rebellion, which is a consequence of Mali’s poor public governance including its regulatory institutions, has compromised peace and security. The macroeconomic environment depends upon peace and security, for investments, especially foreign direct investments. To achieve the objectives of developing the agribusiness sector and better linkage between smallholders and downstream segments, the Malian people need to address these broad governance problems. Otherwise, internal conflicts never favor investment, a fortiori foreign direct investments.
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