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Value chain vertical integration. An implementation framework for agricultural producers' organisations in Morocco

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Abstract: The agricultural sector in Morocco has shown to be a very important component of the country's economy in terms of employment and contribution to the GDP. In order to cope with the limitations that this sector has been facing for several years, the Ministry of Agriculture and Marine Fisheries has launched a new strategy called "Green Morocco Plan" (GMP). Among the objectives of the GMP is to organize the farmers into producers' organizations for each value chain and transform the sector to an engine for the social and economic development of Morocco in the next 10 years. The objective of this paper is to analyze first the opportunities and limitations faced by the vertically integrated agricultural producers' organization (POs) in the context of the GMP and then build a framework that should be followed in order for the POs to fully benefit from the opportunities of vertical integration of the value chain and attenuate its limitations. A case study is conducted in order to apply the results of this work.

Keywords: Value chain; Producer organizations; Agriculture; Vertical integration; Morocco

1 Introduction

Contributing by nearly US \$ 12 billion in the GDP, the agricultural sector holds an important part in Morocco's economy. Over the years, this sector has been suffering from several limitations characterized by low investment, inadequate organization on professionals, limited and inefficient management, complex land tenure and its excessive fragmentation, and dominance of cereal crops. In order to cope with these limitations, the Moroccan government launched the Green Morocco Plan strategy (GMP) that aims to gather farmers into producers' organizations (POs) capable of managing the different stages of the value chain, from fresh agricultural production to transformation and distribution. The state contributes by investing in plantation, irrigation infrastructure and transformation unit for the members of the PO. The model suggested by the GMP intends to create organizations that vertically integrate their value chain.

In the microeconomic theory, vertical integration of the value chain refers to the concept of extending the business operations to cover more than one stage of the chain on the upstream level, downstream level, or both. Porter defines it as the "combination of technologically distinct production, distribution, selling and/or other economic processes within the confines of a single firm" (Isaksen and Dreyer, 2000).

The objective of this paper is to, through reviewing and understanding the theory behind vertical integration of the value chain, identify the features of this concept that apply to agricultural POs and to what extent they do so. The aim is to define the opportunities and limitations for these

organizations and come up with a set of measures that should be implemented in order to benefit from the value chain integration opportunities.

The following analysis starts with a review of the main theoretical approaches which contribute to the understanding of this business concept in order to identify its main aspects as well as its advantages and disadvantages. Following that, as relationship mapping between the aspects of vertical integration and the characteristics of agricultural POs is conducted in order to build our framework. Last but not least, the findings are applied on a case study.

2 Theoretical approaches to vertical integration

Producer organizations are a good example of vertically integrated businesses, producing part of their own raw materials (fresh agricultural products), processing it and marketing the final products. Four main approaches will be discussed, namely: transaction costs economics (TEC) theory, agency theory, competency theory, and strategic management theory.

2.1 Transaction costs economics

In the economic theory, transaction costs are costs of contact, contract and control (Bijman and Wollni, 2008). In other words, they represent the costs relative to an operation of goods or services exchange through the market. Key parameters defining transaction costs are information asymmetry, bounded rationality, opportunism and assets specificity (Klein, 2009). In addition, Bijman

and Wollni (2008) refer to the connectedness of transactions as an important aspect to look at.

When dealing with TCE theory, the assumption that transaction occur in a frictionless economic environment is relaxed (Hobbs and Young, 2001), and market mechanisms combined with imperfect information generate ex ante and ex post costs, respectively relative to suppliers screening and negotiating and to ensuring the terms previously agreed on are respected.

The exchange operations are most of the time subject to information asymmetry, which in situation of high complexity, results in bounded rationality. Bounded rationality refers to the fact that in situation on high complexity and uncertainty, people fail in taking decisions (Jones, 1999), which in the case of a commercial exchange results in incomplete contracts. Ex posts costs are observed relative to monitoring and correction of contracts 'failures.

Opportunism, or "self-interest seeking with guile" as described by Williamson (1988), refers to the fact that in the presence of bounded rationality and imperfect information, it is difficult to state whether a partner will act opportunistically or not (Hobbs and Young, 2001). Direct transaction costs are incurred at both the ex-ante and ex-post levels, rising respectively from screening/selection and monitoring. Other indirect transaction costs may appear from failure to identify reliable partners and losing productivity due to opportunistic behavior (Bijman and Wollni, 2008).

Assets specificity represents a crucial parameter in the transaction costs economics theory. It refers to the situation where on party to the transaction makes investments in an asset specific to the need of the other party, and that is not going to be used alternatively (Hobbs and Young, 2001), which leads to? a unilateral dependency relationship between the two parties and exposes one party of the transaction to opportunistic behavior from the other party. Asset specific investments can take the form of physical, human, site specific, dedicated, brand name capital, and episodic (Tadelis and Williamson, 2012). Costs related to assets specificity is high when the opportunity costs devoted to its second best use is very low (Bijman and Wollni, 2008).

Transaction costs economics theory also refers to connectedness of transactions as an important parameter that is typical to any value chain. In a chain organized as supply → manufacture → Distribute, transactions between supply and manufacture are connected to transactions between manufacture and distribute. This connectedness may lead to typical coordination problems in situations of lack of shared knowledge and information about the decisions that are interdependent and how the ones made at a certain stage affect those made at an earlier or posterior stage (Bijman and Wollni 2008). This is usually referred to as a problem of coordination adaptation. The issue goes beyond a simple exchange of information about individual transactions to become an issue of creating a synergy between all the transactions. The loss of synergy leads to opportunity costs of maladaptation.

The TCE theory gives insights into what type of governance structure might emerge in the presence of the previously discussed parameters, ranging from spot market transactions to full vertical integration. Low levels of uncertainty, information asymmetry, and asset specific investments generally lead to spot market transactions, whereas with growing uncertainty and assets specificity, closer forms of vertical coordination appear in order to reduce transaction costs such as long terms contracts, strategic alliances and full vertical integration. When only one party to the transaction makes asset specific investments, full vertical integration is more likely to take place, while long terms contracts or strategic alliances happen when both parts make asset specific investments (Hobbs and Young, 2001).

Restructuring the agricultural sector into cooperatives (PO) has proven to be a judicious choice to reduce transaction costs. On one side, farmers who integrate into processing and marketing stages of the supply chain reduce the risk of opportunistic behavior from buyers, especially when products are perishable. The cooperative, which is owned by the farmers themselves, plays the role of the buyer. On the other side, transaction costs relative to monitoring producers for quality issues will be lower since there is, in principle, no conflict of interest in the cooperative. PO's can also reduce costs related to performance measurement, since the farmers directly benefit from any profits that are made, and to hidden quality information, with the introduction of quality grade standards and categorization (Bijman and Wollni, 2008). According to the same source, member's identification has shown positive impact on trust within the PO.

2.2 Agency theory

The agency theory is an alternative framework that is used in order to analyze the vertical coordination structure, which deals with the contractual relationship between two parties: agent and principal (Boland et al., 2008). The optimal contractual relationship is a factor of information asymmetry: negotiation and monitoring and enforcement costs (Hobbs and Young, 2001). There are two main branches of agency theory: principal-agent theory and positive agency theory. The first one deals with designing optimal contracts between two parties while the latter focuses on organization and function of the firm, which is defined as a connection of contracts.

The basic principal-agent theory seeks optimal contracting which maximizes the principal's expected utility given that the agent accepts the contract and is willing to work with the objective of maximizing their own utility given the compensation scheme. Positive agency theory tried to explain the firm from its organizational characteristics. It pictures the firm as a team use of inputs among agents with a centralized contractual principal. Two main concerns are observed within this approach, due to information asymmetry, which are adverse selection and moral hazard (Hobbs and Young, 2001). Adverse selection occurs as one party is better informed about the transaction than the other party, while moral hazard refers to agent's

lack of effort and opportunism in case the tasks are not completely observable. As a result of the explained behaviors, transaction costs arise from monitoring the agent's behavior and measuring their outcomes.

In this regard, vertical integration seems to offer advantages in terms of incentives and control. Incentives refer to the ability of the vertically integrated firms to internalize and eliminate opportunism through providing the right incentives for the agent. In terms of control, firms can perform precise internal performance evaluations and decide upon rewards and penalties. Strategically speaking, economies on information exchange are made through vertical integration.

2.3 Competency theory

While the two first theories have analyzed the firm from an economic point of view as a set of transactions, competency theory focuses on the internal capabilities as an explanation to the evolution of firms. This approach supposes that the firm's structure and boundaries are defined by the sum of its competences (Hodgson, 1998). It is based on the knowledge as a central element explaining firms' evolution. Knowledge can take two forms: "codified knowledge" and "tacit knowledge" (Cowan et al., 2000).

Codified knowledge refers to the information that can be recorded as written information (formula, design, standards, etc) and can easily be exchanged between firms under ownership rights. Tacit knowledge represents information that can't be written down. It is special to an organization and is acquired through practice. This knowledge is beneficial only if shared among partners (either internal or external to the firm), thus requiring cooperation between firms or managerial direction within the firm (Hobbs and Young, 2001). Transferring tacit knowledge between firms is not an easy task and may involve high transaction costs relative to insuring information security and follow up of its usage, thus providing more motives for closer vertical relations.

Very few firms seem to be integrated across the entire supply chain (Hobbs and Young, 2001). This situation may be caused by the fact that firms are limited in what they know how to do well, so, as the firm's action scope increases, it may not be as competent and cost efficient as a firm that specializes in a specific given task. It becomes more difficult for the management to monitor employees output efficiently due to growing information asymmetry. Therefore, integration will most likely happen between closely related fields, allowing at the same time to enriching some of the organization jobs, leading to increasing satisfaction and motivation of the workers.

Taking the case of agricultural sector, we rarely see integration between food retailers and producers (either forward or backward) since moving away from the core competencies creates inefficiencies and high agency costs (Hobbs and Young, 2001). However, integration between

processing units and farms is well spread as core competencies are closely related and impose very close coordination to ensure product aspects such as quality and safety.

2.4 Strategic management theory

Compared to the previously analyzed approaches, strategic management theory is based on a more functionalist view of the firm as it globally refers to the process of objectives formulation, planning and implementation, and evaluation, with the objective of achieving and maintaining competitive advantage and high performance over competitors (Raduan et al., 2009).

Strategic management theory has dealt with vertical integration as a business strategy that is implemented in order to achieve competitive advantage. (Lajili et al., 2007) have classified strategic management approaches to vertical integration under four distinct groups which are: value added to sales, qualitative quantitative, input output, and micro analytic. Their work focuses on the micro analytic approach as it provides the most systematic evidence to support its theoretical propositions. A review of the literature shows that this approach propositions are based on the transaction costs economics theory, agency theory, and some strategic considerations related to creating barriers to market entry, reducing the number of suppliers, increasing capital requirements to market entry and mitigating the impact of regulatory price control by transfer of pricing within the firm. Ten propositions to why firms strategically choose to vertically integrate arise from the micro analytic analysis. Firms are most likely expected to integrate in presence of high transactions frequency, small numbers of potential partners, high level of asset specificity, high demand uncertainty, low uncertainty about the timing of obsolescence of specific assets, high complexity of information and technology transfer, high task programmability, high task non-separability, high difficulty in measuring product quality, and a combination of high uncertainty and high asset specificity.

Strategically speaking, vertical integration does not come with only positives attributes. Some disadvantages are to be analyzed before deciding whether to go for this strategy or not. According to Hobbs and Young (2001), supply chain integration disadvantages are classified into three categories: bureaucratic costs, strategic costs, and production costs. Bureaucratic costs refer to diseconomies related to increased need for coordination, control and communication within the firm, which costs are higher in case of vertically integrated firms. Strategic costs are incurred as a result of loss of information and tacit knowledge acquired through relationships with experienced partners and decrease in flexibility as the firm grows bigger. Production costs are mainly related to economies of scale considerations in the use of material and structure inputs which may result in production at less than the efficiency level.

Table 1. Connection between theoretical approaches to vertical integration.

Characteristics	TCE	Agency theory	Competency theory	Strategic Management
Bounded rationality	√	√		√
Opportunism	√	√		√
Uncertainty	√	√	√	
Asset specificity	√			√
Information asymmetry	√	√	√	√
Knowledge			√	
Incentives		√	√	
Profit maximization		√		√

It is clear from the analysis of strategic management theory that the decision to vertically integrate or not is solely based on the motivation to reduce cost and increase the level of control over the supply chain. It is rather based on analysis of pros and cons relative to cost reduction, need for specific investment, increased control and traceability, knowledge requirements, efficiency and need for flexibility.

2.5 Summary

Even though the previous theories have been analyzed separately and seem to differ in many aspects, it is important to point out the fact that they are complementary and sometimes interconnected. This connection is particularly visible within organizational economics theories (transaction costs economics and agency theory), as well as between organizational economics theories and both competency/theory and strategic management as presented in Table 1.

Based on the analysis of theoretical approached to vertical integration, a number of advantages and disadvantages are identified. On one hand, vertical integration allows to have more control over the value chain, more control over costs, and achieve competitive advantage and diversification. On the other hand, the firm must face, as a result of vertical integration, higher bureaucratic and strategic costs, production efficiency problems compared to market actors and reduced flexibility due to significant investments.

3 Agricultural POs and vertical integration

The review of the theoretical approaches to vertical integration allows identifying characteristic of this business concept, the advantages it offers and the limitations it imposes. It is important to analyze which of those characteristics apply to agricultural cooperatives and to what extent they do so and suggest a set of measures for application. The objective is to end up with a framework that the agricultural POs need to follow in order to benefit from value chain integration advantages and attenuate its limitations.

3.1 Brief description of agricultural POs in the Green Morocco Plan

The analysis of the organization and environment of the POs in Morocco allowed identifying 5 important characteristics which are: high number of members par PO, low schooling level among the members, classic internal organization, presence of a transformation unit, and a competitive business environment.

Because of the excessive land fragmentation, and in order to design economically viable projects, a high number of identified farmers need to be gathered, making communication and control operations complex. As presented in figure 1, out of the 317 projects launched between 2010 and 2012 by the Green Morocco Plan (GMP), 65% of the cooperatives created gather more than 300 farmers each (Agency for Agricultural Development, 2012).

The members of the POs, who are farmers coming from the rural areas where the project is being implemented, usually have a low schooling level that would not allow them to effectively manage the POs business operations. In fact, in the rural areas of Morocco, the illiteracy rate is around 63% among the adult population aged 15 years and above (Achy, 2010). As of the technical side, and if farmers have a good land and agricultural knowledge, they lack the required skills to run a transformation unit. That being said, capacity building trainings are planned in every project to allow farmers to be able to manage the PO on their own.

Agricultural POs are also involved in a highly competitive market. The agro-food sector gathers more than 1981 firms, which represents 25% of the total number of industrial firms in Morocco. Those firms produce annually nearly 67 billion dirham worth production (Ministère de l'Economie et des Finances, 2010). Also, Morocco imports food products for a total value of \$ 5.581 billion (World Trade Organization, 2013), which makes the offer on the market worth 114 billion dirham. In terms of demand, the average annual consumption per household in Morocco is estimated to 49,333 dirham, from which 41% is dedicated to food products (Haut Commissariat au Plan, 2013). In 2012, Morocco has nearly 6.81 million households (Haut Commissariat au Plan, 2013), making the demand for food products worth nearly 138.8 billion dirham. This being

said, the ratio demand to supply is 1.2 which shows that there is a very limited gap to cover in terms of demand.

Moreover, quality grades demanded by consumers today impose standards at all levels of the value chain which may eventually require for the farmers to adopt new agricultural practices and follow strict guidelines at the transformation stages. As of the price, ineffective and inefficient management of the POs operation along the value chain will lead to high productions costs, making the products non-competitive.

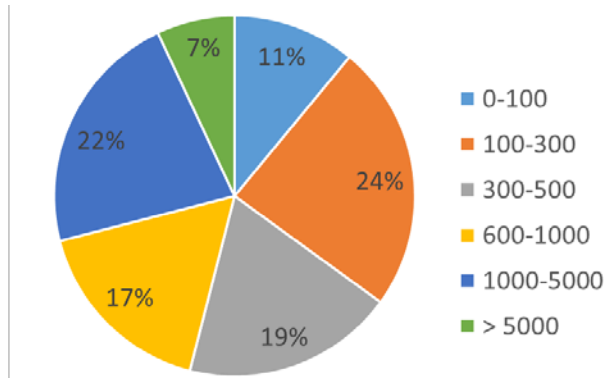


Figure 1. POs distribution according to their size (number of members). Source: Agency for Agricultural Development, Morocco.

Finally, according to the results of the 2012 second semester evaluation survey launched by the Agency for Agricultural Development, which concerned a sample of 1504 farmers and 146 cooperatives, 45% of the farmers claim to be poorly informed about the project components, and 44% of the POs said that they do not hold debriefing meetings. This poor communication situation is partially due to the adoption of an inadequate internal organization. In fact, most of the POs have a classical internal organization to comply with minimum legal obligations and are composed of a president, a vice president, a general secretary and a treasurer. Such an organization is not adapted for managing different sorts of operations, both at the technical and managerial levels.

3.2 Mapping the relationships

Linking the characteristics of agricultural POs in the GMP and the aspects of value chain vertical integration identified in the literature is an important step to determine the opportunities offered by this strategy and how to take advantage of them as well as its limitations and how to attenuate them.

From an organizational economics theories perspective, the high number of farmers combined with lack of communication and transparency leads to information asymmetry which eventually results opportunistic behavior and bounded rationality. In fact, and although the constitution of the PO is supposed to limit the uncertainty and opportunistic behavior of farmers as all benefits made by the organization are shared among the members, lack of

information sharing and transparency may push some of the farmers to sell fresh products to higher bidders. Also, in the absence of clearly identified production and quality objectives (productivity, quantity and type of fertilizers, irrigation periods and quantity,...), farmers may exhibit bounded rationality and used agricultural practices that seem to be enough for them but that do not stand up to the POs objectives. In addition, the high number of members makes it very difficult to perform control operation, which will be even harder in the absence of shared and clear objectives, giving place to high transaction costs. We see here the opportunity to communicate about objectives, standards, practices and any information necessary for an efficient flow of operations. According to (Bijman and Wollni, 2008), sharing mechanisms like norms and customs reduces the transaction costs of keeping individual actions in line with group interests.

In terms of competency, the integration of the transformation unit imposes knowledge acquisition at two levels. First, it is obvious that the members who will be designated to manage the transformation unit need to acquire managerial skills, agro-industrial knowledge related to inputs, temperature, shelf life, quality standards and so on, and business knowledge related to keeping accounting records. Therefore, training sessions have to be regularly offered in order to be aware of those basic principles and also in order to be up to date with the new technologies and practices to stay competitive. Second, the transformation process imposes some characteristics on the crops in terms of productivity, product size and quality, use of fertilizers and pesticides, etc. In fact, it is a commonly shared package of best agricultural practices that should be adopted by all farmers.

Given the high number of farmers that constitute the PO, bureaucratic costs related to the need for coordination, control and communication are expected to increase. Strategic costs relative to the loss of information and tacit knowledge acquired through relationships with experienced partners (inexperienced internal operators) and loss of flexibility (very high number of members who have equal voting rights) will also be observed as a result of integration. These costs should be reduced through regular employees training and benchmarking. Concerning production costs related to economies of scale considerations, and since the size of the transformation unit in any project is based on the crop type, estimated productivity and the marketing period, these costs are not very likely to show up on the normal course of action. Table 2 summarizes the relationships between the main attributes of the agricultural cooperatives and the characteristics drawn from the review of the approaches to vertical integration.

We can deduce from the discussion above that the actual situation of agricultural cooperatives in the GMP exposes them to most of the aspects tackled by value chain integration. Mapping the relationships allowed identifying 12 initial measures that should be implemented in order to benefit from value chain integration advantages and attenuate its limitation, which are presented in Table 3.

Table 2. Aspects of vertical integration vs. characteristics of agricultural POs.

Characteristics	Number of farmers	Low schooling level	Classic organization	Transf. unit	Competitive business env.
Bounded rationality	✓	✓		✓	
Opportunism	✓	✓	✓		
Uncertainty	✓	✓			
Asset specificity				✓	✓
Information asymmetry	✓	✓	✓		
Knowledge		✓	✓	✓	✓
Profit maximization	✓	✓	✓	✓	✓

Table 3. Necessary measures for an effective value chain vertical integration by agricultural POs.

Measure	Description
1. Identifying members and their roles in the PO	Creates a transparent governance system in the POs through the identification of members and their roles. It has shown significant positive effects on the trust that members have in their cooperative and reduces behavioral uncertainty and opportunistic behavior.
2. Increasing farmers awareness about their rights and obligations towards the PO and include them in the decision making process.	Make all members aware of their rights and obligations towards the PO in order to reduce opportunism and behavioral uncertainty.
3. Defining and sharing clear productivity and quality grades objectives for farmers and the agricultural practices.	Setting objectives and breaking them down to the level of farmers, detailing the productivity and quality expected from each one of them. This action will reduce information asymmetry, bounded rationality and transaction costs relative to control. It will also reduce opportunity costs of maladaptation and lack of synergy and help achieve competitive advantage.
4. Introducing clear and transparent reward system for dispatching the added-value (benefits) generated by the cooperative.	This measure is meant to clarify the benefits dispatching procedure in order to avoid conflicts within the PO. Increases the members trust in the cooperative and decreases opportunistic behavior.
5. Business capacity development trainings in management.	Capacity development in management will provide the members with responsibilities with the necessary knowledge to run the business.
6. Technical trainings in manipulating transformation unit machines.	Capacity development in manipulating the transformation unit machines will provide the team responsible of the TU with the necessary knowledge to technically run it.
7. Technical trainings in agri-food (types of inputs and their quantities, transformation duration, ...).	Capacity development in the agri-food area will provide the members responsible about the TU with the necessary knowledge to ensure products quality and safety.
8. Trainings in agricultural practices imposed by the productivity and quality objectives	Capacity development in agricultural practices will enable farmers to apply the agricultural practice imposed by productivity and quality objectives.
9. Setting short-term, mid-term and long-term objectives.	Setting goals and objectives gives the PO a sense of purpose and direction, a framework around which they do create plans to achieve competitive advantage.
10. Breaking down the objectives and planning their execution.	Defining the needs in terms of agricultural practice, inputs, human resources, investments, etc. clarifies the different decisions that should be made at all levels of the supply chain, increases coordination and reduces costs relative to control.
11. Building a control panel.	This measure insures pro-activity and increases control over the supply chain.
12. Providing continuous training (technical and economic) and benchmarking	Reduces strategic costs incurred as a result of loss of experienced partners from spot market transactions.

3.3 Case of COPAG

In the agricultural cooperatives sector of Morocco, COPAG is considered as a success story. Understanding the reasons behind its success will help us confirm our initial results and perhaps identify new measures. The PO, which started back in 1987 with 39 farmers, gathers today 179 members, including 65 cooperatives bringing together

nearly 13,000 farmers. In 2007, this PO employed nearly 3200 people, managed 11,100 ha of crops land and a herd of 80,000 cattle (Haminaz and Sbair, 2007). It currently holds 20% to 25% of the market share in dairy products (2nd place) and 15% of the milk market (3rd place). According to the same authors, it is clear that the success of COPAG is based on a

Table 4. Summary of measures and their objectives.

Objective	Measure	Execution indicator	Impact	Data source
Category I: transaction costs reduction				
Reduce transaction costs related to uncertainty and opportunism	Identifying members and their roles in the PO	Members list and organizational flow chart are available	Increased members trust and reduced behavioral uncertainty and opportunistic behavior	Organizational flow chart and members list
	Increasing farmers awareness about their rights and obligations towards the cooperative and include them in the decision making process	Awareness sessions are held	Increased members trust and reduced behavioral uncertainty and opportunistic behavior	Meeting minutes + attendance list
	Introducing clear and transparent reward system for dispatching the added-value (benefits) generated by the cooperative	An article relative to dispatching benefits is available in the constitution	Increased income of members	Benefits allocation budgeted according to the PO's constitution
Reduce transaction costs related to bounded rationality, control, and lack of synergy	Defining and sharing clear productivity and quality grades objectives for farmers and the agricultural practice that goes with it	Productivity and quality objectives and a detailed agricultural practices package is available at the level of every farmer	Reduced information asymmetry, bounded rationality and transaction costs relative to maladaptation and lack of synergy. Increased control over the chain	Budget structure of the PO
Category II: Capacity development				
Acquisition of the necessary knowledge to run the transformation unit	Business capacity development in accounting and management	Trainings are held	Knowledge to run the accounting unit and human resources unit is acquired	Training content and attendance list
	Technical capacity development in manipulating transformation unit machines	Trainings are held	Knowledge to run the transformation unit is acquired	Training content and attendance list
	Technical capacity development in agri-food (types of inputs and their quantities, duration, ...)	Trainings are held	Knowledge to ensure product safety and quality is acquired	Training content and attendance list
Acquisition of knowledge about agricultural practices imposed by productivity and quality objectives	Technical capacity development in agricultural practices imposed by the productivity and quality objectives	Trainings are held	Necessary knowledge to apply new agricultural practices is acquired	Training content and attendance list
Acquire knowledge to play the role of the leader and negotiator with external partners	Capacity development in negotiation and communication	Trainings are held	Necessary knowledge to play the role of the leader and negotiator is acquired	Training content and attendance list
Category III: Achievement of competitive advantage				
Set general objectives for the PO	Setting short-term, mid-term and long-term objectives	Objectives (with target values) are set.	Achieve competitive advantage	Business Plan
Identification of needs and planning their use	Breaking down the objectives and planning their execution	Execution plan is available	Coordination is increased and more control over the supply chain is gained	Work plan and Business Plan
Effective follow up of operations and evaluation	Building a control panel	Control panel is available	More control over the supply chain is gained	Internal audit unit work plan + Control Panel
Stay updated with latest development in the market	Providing continuous training (technical and economic) and benchmarking	Market price watch unit set and Trainings are held	PO is up to date with the latest tools in the market	Training content + attendance list

good integration of its value chain by taking several actions for a better proximity with its members to increase their trust and loyalty towards the mother cooperative. COPAG has adopted a transparent governance system and has put the benefit of its members as one of its main objectives. The cooperative engages in a day to day work support (technical and techno-economic) and guidance with its members. It has also taken the role of the front

office with the supplier, ensuring negotiations and acquisition of necessary inputs. It performs several daily actions such as dialogue, negotiation, guidance, defending interests, information sharing, training, promoting activities, technical and techno-economic support, procurement and marketing, regulation and control.

In order to push further the analysis of COPAG's success factors, a SWOT analysis of the PO has been undertaken. An interview conducted with its commercial director has allowed us to conclude that the strength of this organization comes indeed from the daily technical and economic support to the farmers, the continuous training offered to the employees, the transparent internal organization, the social responsibility of the cooperative, the integration of the distribution and from ensuring procurement negotiations for all inputs.

On the light of COPAG experience, and following the already identified measures to successfully integrate the value chain, we can see that there still some actions that should be undertaken by the agricultural POs. First, in order for the PO to play the role of the leader and ensure negotiations and acquisition of necessary inputs, capacity development trainings in negotiation and communication should also be implemented. Second, the cooperative must put in place a transparent governance system. This action should be integrated with "identifying members and their roles in the PO". Last but not least, and as proven through empirical research conducted by Frohlich and Westbrook (2001), integrating the distribution part of the supply chain will have a positive impact of the supply chain performance of the cooperatives. However, based on the important investments that should be made in order to reach this level of integration, this action is not immediate but stays as a recommendation for future development.

3.4 Measures to benefit from value chain vertical integration opportunities and attenuate the its risks

Following the analysis conducted in the previous sections, this section proposes a framework that recapitulates the different identified measures and specifies their objectives, execution indicators, impacts, and data source. The measures have been split into three categories based on the aspects it tackles which are: transaction costs reduction, capacity development, and achieving competitive advantage.

In terms of reducing transaction costs, it is suggested that the PO identifies its members and their roles, increases farmers awareness about their rights and obligations towards the cooperative, introduces clear and transparent reward system for dispatching the added value (benefits) generated by the cooperative and defines/shares clear productivity and quality grades objective among farmers and the agricultural practices that go with it. The objective is to reduce transaction costs related to uncertainty, opportunism, operations control and lack of synergy.

Concerning capacity development, PO members, depending on the tasks they are going to perform, should attend capacity building sessions in management, transformation unit and machines manipulation, agri-food processes, new agricultural practices imposed by productivity and quality objectives, and in negotiation and communication. This will allow them to acquire the necessary knowledge to run the transformation unit, adopt

new agricultural practices and play the roles of the leader and negotiator with external partners.

The last category gathers measures with the objective of achieving competitive advantage. It is suggested that the POs sets objectives at the short, mid and long term, breaks down the objectives and plan their execution, build control panels, provides continuous training to active member and performs regular benchmarking to stay up to date with the latest development in the market. Table 4 summarizes the measures.

4 Conclusions

The study presented in this report has revealed some key elements of supply chain integration that businesses have to take into account when deciding to follow this business strategy. Reviewing the literature from different perspectives allowed identifying organizational characteristics related to vertical integration and how this business concept helps to tackle them, such as bounded rationality, opportunism, uncertainty, asset specificity, information asymmetry, knowledge, incentives and profit maximization. Combining all those elements, we were able to recognize the advantages and disadvantages of vertical integration which can be summarized as in Table 5.

Table 5. Advantages and disadvantages of value chain integration.

Advantages	Disadvantages
Control over the value chain	Bureaucratic costs
Control over costs	Reduced flexibility
Competitive advantage and diversification	Strategic costs and production costs
Introduction of new core competencies	

Mapping the relationship between the identified characteristic and the case of agricultural producers' organizations in the context of the Green Morocco Plan was an important step towards understanding which characteristics apply to these POs and determining their opportunities and limitations. Bringing together all those elements allowed to come up with a set of actions that the cooperatives should apply as to be able to fully benefit from supply chain integration. The actions concern three main components which are cost reduction, capacity development and competitive advantage achievement.

The results of this work have shown many weaknesses in the way cooperatives are organized and how they manage their operation. These weaknesses represent major risks impacting negatively the health of the organization. Therefore, the GMP is invited to launch intervention actions in order to restructure the existing cooperatives and prepare a solid ground for the upcoming ones based on the improvement framework suggested in this study.

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