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QUALITY AND COMPETITIVENESS OF COFFEE EXPORTS: THE INFLUENCE OF COOPERATIVES

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ABSTRACT

Coffee production in Brazil is consolidated through changes in production management in response to the demand for quality and sustainable products. Good agricultural practices permeate all stages of production, and the various certifications, in the search for competitiveness. The financial reward and gain in competitiveness in the activity have been more perceived by the cooperative producers. The Cooperative acts as a channel of information flow on management and quality for the producer. To analyze the influence of cooperative in the marketing of coffee and the organizational changes provoked in the period from 1996 to 2016 was the objective of this article. In the bibliographic reference, scientific and statistical works were compared from 1988 to 2016. Brazil strengthened itself as an exporter of specialty coffees (quality improvement), starting in 2006, a year of strong cooperative growth. The official statistics account for a differential (economic advantage) of 30 to 40% in the average price / bag, received by the producer when cooperated. The volume exported by cooperatives is still small since not all are official international agents. Gradually the production and commercialization of specialty coffees have been influenced by cooperative, which allows for a reduction in production costs as well as protection against business risks.

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INTRODUCTION

The production of coffee in Brazil due to its complex and diverse coffee park, provides various types of beverages, flavors, and aromas, constituting a market differential for competitiveness, where the cost of agricultural production is usually the most critical factor. In Brazil, the use of technology and innovation is taken into account as a relevant factor in the analysis of competitiveness. In general, the coordination among the segments (multiple agents / stakeholders) of the coffee agribusiness still needs improvements, mainly to balance the quality, the technological application, and innovation, in the diverse producing regions of Brazil. Monteiro and Zilbersztajn (2013), observed that the cooperation between multiple agents / stakeholders, with different levels of information, generates opportunities to capture and / or add value to production. Complementing this (challenging to producers) cooperation, they highlighted the need for a refinement in the internalization of costs (financial

and productive) and in the adequacy of properties to changes in consumer habits. In relation to multi-agent cooperation, Müller (1981), Kageyama *et al.* (1990), Kageyama and Silva (1988) and Silva (1996), have already indicated that in the value chain of coffee production, inter-sectoral relations occur, with the perspective of absorbing innovations and technologies in management, quality, administration, and positioning of the market. Although its development took place from 1906 in Brazil, only from 2006, the management of rural properties, found in the associative and cooperative system, an alternative in the viability of the new requirements required by the market (MAPA, 2015). Both Cooperative and Associativism have as a principle the formal cooperation for the production and commercialization of goods and services. This composite structure enables rural landowners to purchase and use inputs and equipment collectively, as well as share costs with technical assistance and management and training (MAPA, 2016). The evidence of management (productive changes "inside the gate") in the rural properties, allowed to visualize results in the quality and differential processes of the product, providing a new market positioning for Brazilian coffee (product differentiation by the stakeholders). The organization

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in cooperative or association by the rural proprietors provides access to the technical assistance, technology, and innovation, that are fundamental for the restructuring and organization of the agricultural space. The changes brought about in the relations between the stakeholders of the value chain of the Brazilian agroindustrial sector, in general, adjust to the new productive and organizational reality. The reasons for the maintenance of a cooperative and / or associative relationship are the importance that the producers perceive about the effect of the factor "confidence in production," besides the improvement in the storage conditions, technical assistance offered, access to exchange for inputs and sale in the future market. In this context, the challenge in the analysis of knowledge and management of rural and coffee farms, with the adoption of good agricultural practices and value chain agents, presents itself in understanding if these partnerships over time have reverberated in positive results for the rural owner. Finding opportunities to increase the competitiveness of the value chain has been a constant concern in formulating strategies to seize market opportunities. For this purpose, in this study, the performance and participation of cooperatives in the production and export of coffee in Brazil was the objective. Characterizing the influential role of cooperatives / associations in the commercialization of coffee and organizational changes in administrative and production management, analyzing data available from 1996 to 2016. Thus, one hypothesis for this study is to understand if the cooperatives and associations of Brazilian coffee producers have acted as a source of knowledge to reach the international market, that is, they are important channels of information flow of quality.

Theoretical foundation: The search for quality, higher levels of productivity, reduction of costs and strategic alliances or new organizational arrangements, is increasing among producers, especially those that are organized in cooperatives and / or associations. The historical characteristics of the transformation of the technical base of the Brazilian field, representing the mechanization and the technification of the agricultural production, mainly post 2006, are presented as influencers of Brazilian productivity and consequent gains in participating in new market opportunities. The financial reward of the production of specialty coffees and the gain in competitiveness has been more perceived by cooperative and / or associated producers acting as a channel for the flow of information on product quality. The innovation and the technology applied to the production of the coffee sector have been fundamental for the restructuring and organization of the agricultural space and its agents, both internal and external influencers (SAES AND SILVEIRA, 2014). The influencing agents or drivers of change (DUNCAN, 1998) are elements of reality that directly influence the strategic environment, investments, R & D activities or knowledge. Cooperatives and / or associations of producers are agents that influence the value chain that interacts in the changes in rural organizations and in the management of agricultural properties (AMBLER, T. & C. STYLES, 2000). This creates a growing awareness among coffee producers of the need to recognize and understand the opportunities for competitiveness and productivity that increase their insertion in the market, although Brazilian production is in different types of systems. The management and administration tools used in the production cycle and own value chain, little is known about the potential of an efficient value chain and the benefits of synergy among its agents.

In a number of studies, Porter (1989), Prahalad (2010) and Duncan (1998) offer subsidies that strengthen organizational value chain strategies with differentiated and collective skills. Gregoratti (2011) warns that the use of management standards and / or certifications in production can constitute a crucial strategy for the promotion of sustainable development with a focus on changes in value chains. It is a consensus among the authors cited in the bibliographical references that the dimension of the value chain, must present synergy with the competition standards for the coffee market produced with good agricultural practices and quality differential. Rubin (2005) proposes an analysis of the value chain with socio-environmental management, proposing its weight in knowledge and management. In this analysis, the indicators related to natural production conditions and environmental management refer to the physiognomy and condition of natural habitats, areas of agricultural production, non-agricultural activities and consequent productive and landscape diversities. Also included in its analyzes are compliance with legal reserves and permanent preservation areas, the situation of eventually degraded areas, ecological corridors, outbreaks of endemic disease vectors and survey of land use and management of productive activities.

In the analyzes of competitiveness through social capital and environmental impact, Utting's (2009) studies on Nicaragua's coffee production (CAFENICA and Comercio Justo) use relevant indicators of quality and conformity of coffee production from the activities soil management, fertilizers used, waste management and management practices, applied technological administration, training and training of personnel, preservation in addition to indicators of health, safety and well-being of the individual and the family. In order to strengthen the competitiveness of the sectors and to continue the expansion path, the model of productive arrangements (cluster) Porter (1989) has been proposed. The concept of agricultural arrangements (clusters) seeks to strengthen the competitiveness of the localities they have in agribusiness, much of their productive structure. In coffee production, it is extended to customers, processors, distributors, governmental and non-governmental institutions, research institutions and trade associations that offer training, information, research and technical support (WEDEKIN, 2002). Cooperatives and associations are in this sense a tool to minimize the costs of insertion in the particular and differentiated Market (LANDSTROM, 2008). In this paper, we present an interactive and permanent process between people (knowledge and experience), technology (systems and management) and environment (organizational routines and preservationists). There is a consensus on the influence of knowledge on the identification of opportunities in an interrelated way (TURREL and LINDOW, 2010). Also in 2010, Prahalad points out that knowledge goes beyond a specific person or activity, involving all stakeholders involved in the process of continuous improvement (dynamic core competencies). Methodologically, Costa Rica's initiatives (ICAFE - National Coffee Plan), considered one of the best coffee producers in the world, differ from the Brazilian model. Since coffee is responsible for 46% of the country's exports, only in the 2015/016 crop, 1,492 million bags were produced, the production is only of Arabica coffee of the Caturra and Cauaí varieties, and since 1989, the planting of the robust coffee for lower cup quality is prohibited by law. Technological progress and coffee management since the implementation of the National Coffee Plan allowed the

standardization of plantations to the characteristics of each producing area that is cultivated in fertile soils of volcanic origin and low acidity, between 800 and 1,600 meters of altitude and in temperatures between 17° and 28° with annual precipitation of between 2,000 and 3,000 millimeters. Another difference in coffee production in Costa Rica is that only manual and selective harvesting is used, allowing only mature beans to be selected. With this harvesting system, it was possible for rural producers in each coffee producing region of Costa Rica to join a quality improvement agreement, where the beneficiation companies agreed to receive and process only mature fruits, which guarantees 80% of the production with quality and added value.

Brazil in 2015, according to the competitive coffee intelligence / UFLA bureau, maintained its position as the world's largest producer and exporter and the second largest consumer of coffee. The expansion of coffee production frontiers in Brazil in the 20th century brought with it the formation of a cooperative. In the late 1970s and early 1990s, cooperatives were already consolidated as organizations for the coffee agro-industrial system. OCB (Brazilian Cooperative Organizations) counts the registration of 6,600 cooperatives. For credit are 980 cooperatives, with 6.9 million cooperatives and the generation of formal positions around 46.8 thousand posts. In the agricultural sector, there are 1,543 cooperatives, with 993,500 cooperatives and 180,1 thousand regular jobs. According to data from the IBGE (Brazilian Institute of Geography and Statistics), 48% of everything that is produced in the Brazilian countryside passes, in some way, by a cooperative. Brazil has 97 coffee cooperatives registered in the (OCB) system. They are located mostly in the states of Minas Gerais and São Paulo. Coffee cultivation takes place in almost 200 thousand establishments of family agriculture, distributed in 1,468 municipalities throughout the country, according to the last Agricultural Census, IBGE in 2006. Most coffee producers are members of associations and cooperatives. Of the total Brazilian production, approximately 28% of the coffee in coconut passes through the cooperatives in its process to the final consumer, with 10% being exported, while approximately 40% of the Brazilian coffee growers are cooperative. The production of specialty coffees in Brazil is now about 12% of the international market for the drink, and most of it comes from cooperative and or synergic producers with the attributes of good agricultural practices. For the competitive coffee intelligence bureau, in 2016 the coffee production chain in Brazil is responsible for generating more than eight million jobs in the country, providing income, access to health and education for workers and their families.

According to the National Coffee Council (CNC), in 2016 the cooperative system and its professionals potentiate several cases of success of rural producers who obtain better remuneration and become Brazilian and worldwide suppliers of sustainable coffee with exceptional quality. It is recognized that associated and cooperative coffee producers in a competitive market acquire greater bargaining power and protection against price swings. Three are the main factors in the formation of coffee cooperatives in Brazil, indicating that these associations were constituted as a way for producers to acquire market power. Thus coffee cooperatives were constituted as a form of economic defense of producers (factor 1), against the fluctuations of coffee prices (factor 2) and the increase in the risk of these oscillations, without losing sight of the defense against opportunistic behavior and as a way of

reducing costs through scale effects (factor 3). However, in view of the current competitiveness of the national and international markets, especially in the case of coffee, one of the leading agricultural products of the Brazilian export agenda, cooperatives play a fundamental role, linking the rural producer to the market. This differential performance, in large part, because farmers receive technical, agricultural, environmental, economic and market orientation of the cooperatives and qualify in these areas, becoming managers of their rural properties and increasing the environmental preservation and the number of jobs in the activity. The Cooperativa is a diffuser of technology that takes the rural producer to the sustainable management of its property, giving liquidity to its production at the best possible price and providing the most suitable inputs. Being a cooperative, the producer feels at ease to attend, get informed and do business, as he is one of the owners of the company. In the bibliographies consulted (Reeves and Bednar, 1994; Duncan, 1998; Prahalad, 2010; Porter, 1989 Castro Junior *et al.*, 1998 and 2003) for the methodology of comparison and observation of changes in the current coffee market Rica and Nicaragua), it is noted that to gain competitiveness in the quality of the product offered to the consumer is a conditioning issue. The aim is to understand if cooperatives and / or producers' associations are able to stimulate improved management and quality in rural organizations, whether cooperative producers tend to differentiate competitively in the market because they enjoy the essential collective skills available by cooperatives and / or associations (Fig. 1).

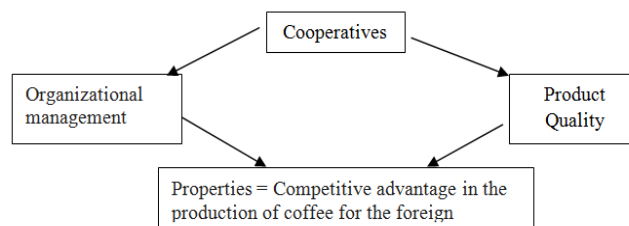


Figure 1. Conceptual Development of the Study

There are several indicators of quality attributes (Reeves and Bednar, 1994 and Maximiamo, 2000) for coffee, physical characteristics such as origin, varieties, color, size, environment, social and coffee labor are the most recognized by the market. "Quality is consistent with consumer expectations" Slack *et al.* (1996), where compliance indicates that there is a need to meet an explicit specification, ensuring that a product or service meets the specifications set (measurable set of characteristics, meeting consumer expectations). In Brazil, according to studies by Wagner Neto (2006), production efforts focus on the attempt to harmonize the various standards in order to reduce compliance and compliance costs. Ideologically, most of the certifications for coffee present similarities of quality to serve the globalized market, in the continuous improvement and / or good agricultural practices applied to coffee production, quality is the base variable for increasing competitiveness in the current market and for share achievements. On the other hand, conventional coffee growing systems in Brazil, generally producing commodities, have as their main weaknesses a low capacity for the use of renewable natural resources and the gradual loss of low renewable natural resources. This characteristic implies in need of this system to be always replenishing nutrients in the crop and acquiring materials and

services external to the productive system. The result is a significant increase in production costs and an increase in financial dependence and the vulnerability of producers to the oscillations of the price of coffee in the market (SARCINELLI and ORTEGA, 2006). The independent certification or multi-certification verified very much in the Brazilian production, adopts mechanisms of control for the environmental and social parameters, for the recognition of the quality of the coffees. In order to present international recognition standards by the importing countries, the production standards must be adequate to the ISO system. This means that producers can present in their property, production system in line with various types of certifications such as UTZ Kapeh, ISO 14000, BSCA, ABIC, to value and differentiate their origin and product. Understanding agricultural practices suitable for the production and well-being of workers, involving economic, social, cultural and environmental criteria (process management, instruction, adequate training and well-being of employees and permanent preservation of soil, sustainable sources of energy and water sources) (COCARO, 2008). Similarly, to ISO 14000 it is a standard that determines guidelines to ensure that a company (public or private) practices environmental management. Its primary goal is to ensure environmental balance and protection by preventing pollution and the potential problems that it could bring to society and economy. Currently, this type of business profile contributes to the appreciation of the company's products and services and the brand. The analyzes and statistics of ABIC (Brazilian Coffee Industry Association) believe that the industry should have a "guarantee of good practices in the process." This guarantee is ensured by conducting periodic audits that ensure that the establishment has a minimum standard of quality, by means of a minimum "overall grade" given to the coffee according to the quality of the beverage.

MATERIALS AND METHODS

In the bibliographies researched and referenced, it is perceived that technological innovation is the way to maintain competitiveness. Its application in production and management processes created institutional relations between agents, active and focused, especially in technical assistance, rural extension and scientific research. Methodological exploration evaluated changes in production (adherence to good agricultural practices) after adherence to cooperative and / or associative (2006), with data collected in IBGE, CONAB and CECAFE statistics, from 1996 to 2016. It should be noted that the data used in this article were collected from research institutes and statistics and export agencies, but responses involving producers and other actors in the value chain can always add rigor to the findings. The variables chosen for the analysis in the period 1996 and 2016, made available in the bibliographies consulted and in the statistics of official bodies, were oriented to the perception of the verification of the increase in the participation of exports and coffee production, the participation of traders and roasters and the Brazilian participation in the coffee export market. In the methodological exploration to evaluate the changes perceived by the rural proprietors in relation to the commercialization and production of coffee, performance indicators were used, such as productivity per hectare, government investments in research, the average price received by producers in exports. The agroindustrial chain of coffee in Brazil is organized in different ways, depending on the region and the production system, the degree of processing and distribution. However, a

large volume of coffee production, which comes from the central producing states (Minas Gerais, Espírito Santo, São Paulo, Paraná, Bahia and Rio de Janeiro), takes place in several links of the agroindustrial chain. The State of Minas Gerais has the most substantial number of cooperatives dedicated to the commercialization and export of coffee, and its productive area is the largest in Brazil. The survey of production data with manual harvesting and mechanized harvest was considered in the analyzes. The coffee producer operates its production in a way that interacts upstream with the agents of the segments of machinery, equipment, bagasse, agrochemicals, credit, labor, technology, technical assistance, packaging, consumer material, firewood, and seedlings. are distinctly related, and downstream (coffee destined for the market) with processing agents; roasters; and delivery to the cooperative.

RESULTS AND DISCUSSION

Cooperatives play a crucial role in the processing and marketing of coffee. In some regions, they are more active than others. In the South of Minas Gerais, the leading coffee producing region in the country, more than 80% of the coffee is traded through cooperatives and / or export agents that work under a partnership regime in storage, processing, and marketing and, to a lesser extent, in the activity of roasting. (CASTRO JUNIOR *et al.*, 1998 and 2003). However most certified producers sell only part of their crop to specific markets, the other part is to meet the conventional market. This fact of partial commercialization raises essential questions about the capacity of certification standards (JARDIM, SAES, and MESQUITA, 2014) and of the cooperative / associative, in improving the participation of small family producers in the market of quality and differentiation. As of 2006, there is an increase in coffee production in Brazil of almost 50%, without the same proportional expansion of the area under cultivation. This is mainly due to the greater spraying of advanced agronomic research, improvement in productive infrastructure and the introduction of productivity technologies, provided by the increase in cooperative and / or associative (IBGE, 2015). When productivity is observed for the years 1996, 2006, 2013 and 2016, there is a significant improvement in yields per hectare. In the up to 2006, it surpasses 15.7 sacks per hectare to an average of 26.8 sacks per hectare in 2016. The volume of coffee produced by cooperatives and producer associations can be seen in Table 1. There was a growth in the representation of production from 27% in 1996 to 41% in 2016, with its jump accompanying the period of 2006, when the greater synergy between cooperatives and producers.

Table 1. Participation of Cooperatives in Brazilian Coffee Production (M / scs)

	1996	2006	2013	2016
Cooperatives	4.281.360	12.575.088	17.797.081	20.508.000
Total Brazil	15.290.569	26.198.099	36.320.574	49.640.000

Source: IBGE, 2016

Although participation in production was significant in the period from 1996 to 2016, the participation of cooperatives and associations in the volume of coffee exports evolved more slowly (IBGE, 2017). In 2006 the exhortation represented approximately 6.9% and in 2016 presents in around 9.8% of total production. The traditional importers of Brazilian coffee

remained in the studied period from 2006 to 2016, USA, Germany, Italy, Japan, and Belgium, changing only the rankings. According to CONAB, in 2016 there was frustration in domestic production and exports reached 36.8 million bags of Arabica coffee, with an average selling price of US \$ 166.32 / sc. The total share of coffee in the balance of Brazilian exports is approximately 24%, the difference not exported through the cooperative is marketed by national and international traders and roasters. This difference, approximately 90%, is one of the justifications of why farmers do not see a differential for the commercialization and production of specialty coffees, as can be seen in Table 2

Table 2. Participation of cooperatives in Brazilian coffee exports (M / scs)

	1996	2006	2013	2016
Cooperative	1.391.442	1.833.867	3.014.608	3.615.267
Traders/Roaster	13.899.127	24.364.232	33.305.966	33.275.203
Total Brazil	15.290.569	26.198.099	36.320.574	36.890.470

Worldwide coffee production has undergone a technological revolution, allowing a significant growth for coffee produced at altitude or mountain, Brazil being an outstanding player, mainly in the southern region of mines. The numbers of the OCEMG (Organization of Cooperatives of the State of Minas Gerais), 2015 demonstrate the strength of the productive sector (farmer) and for the development of the coffee economy. Although associated or cooperative producers reach a more potentialized market, management, structure, and organization of the business are critical to the results. Contrary to the growth of production and productivity, there are investments in coffee research, which in the same period from 200 to 2016, showed oscillations, going from R \$ 16 million in 1996/2000 and reaching 2016 with something around R \$ 11 million (Table 3).

Table 3. Indicators of Performance of Brazilian Coffee Growers

	2000	2006	2013	2016
Productivity sc/ha	15,7	19,8	24,3	26,33
Export Average Price (US\$/sc)	96,67	120,23	164,81	166,32
Export Average Price (US\$/sc)	20,3	29,5	32,2	46,0
Investment in coffee research (R\$/M)	16,0	7,5	0,0	10,6
IPR – Price received by producers *	163,81	250,33	288,93	501,8

Source: IBGE, 2016

*(R\$/sc coffee type 6) CEPEA/ESALQ.

In general, the agro-coffee system has been affected by the demands and trends of consumers, which are already applied to the food industry, practicality and quality; health and well-being; pleasure and sensoriality; ethics and sustainability and value of origin. Brazil has been benefited by the expansion of both internal and external consumption of coffee and has been reorganizing to meet increasing demand for blends (Brazilian coffee blends) and to be globally recognized as a producer of washed coffees, becoming the source of coffee produced with sustainability and differentials with origin. Through the steady diffusion of technology in the coffee sector, it is possible to evidence a restructuring in the organization of the agricultural space, culminating in profound changes in the relations among the value chain stakeholders. The revolution in technical assistance specifically for the small and medium producers, often representing family companies, has generated impacts on the productivity and management of organizations.

In this context, the cooperative is an agent that passes on the associates the means of production and, downstream when it receives the production and proceeds the transformation and commercialization of the product. Also aiming at maintaining inventories, coordination of auctions and programs to improve competitiveness. It is recognized that an association or cooperative of rural producers in Brazil, in a competitive market of positioning, allows them to acquire greater bargaining power and protection against price fluctuations, as well as knowledge and qualification in environmental management and administration of their organizations (BUREAU, 2013). The advantages of the union in cooperative or associations are in the possibility of acquiring inputs and equipment, in the collective use of equipment and machines, as well as in the sharing of costs with technical assistance and management and training. Cooperatives with roasting units represent the most recent form of verticalization of the coffee production chain. Its main characteristic is the concentration of drying, processing, roasting and milling operations.

The roaster generates benefits in the commercial transactions in a managerial strategy to enable the costing of the administrative structure that is at the service of the associates. Through diversification of coffee production, the drive for economic development and technological diffusion in the sector has allowed farmers better organizational management. The introduction of harvesters (flat and mountainous), irrigation, riveting, slow-release fertilizers, has been announcing a social revolution in the workforce and its working conditions. These changes in the Brazilian agroindustrial sector, in general, arise from adjustments to a new productive and organizational reality, expressed mainly in the development of complex relationships among the agents that operate in the various segments of the chains. The coffee sector has undergone an extensive transformation in its rural properties, with the purpose of adding value, mainly in terms of the quality of the product and well-being of the employees, in response to the attributes and demands of the final consumers. In the architecture of the coffee production process, the valorization of the quality requirement is the major imperative to improve the individual and systemic competitiveness of the sector. In a dynamic sector, its innovation depends on the accumulation of knowledge, that is, the adoption and technological change, through the absorptive and learning capacity of the producer and employees and not only through the productive inputs applied (VIAN, 1997). For the 2015/2016 crop, the figures presented by MAPA for the production of 20 bags per manual and mechanized hectare were significantly influenced by the advances in technology and in the management of the productive environments of the properties, in relation to the costs for the 2006 harvest when the average yield was 16 bags / ha. (Table 4).

Table 4. Comparative Cost of Production of National Average Coffee in US \$/scs

	Crop 2005/2006	Crop 2015/2016	Average Rate
Manual Harvest	122,00	113,00	2,35
Mechanized Harvest	238,00	92,00	3,45

Conclusions

The literature surveyed allow us to observe that small, family producers perceive competitive advantages when they enjoy essential competences permeated in the value chain (Prahallad,

2009) when organized collectively to achieve common goals. In the foreign market, Brazilian rural properties still need to exploit their personal resources (Barney, 2001) better. A resource is understood as the ability to overcome the limitation of scarcity in managerial knowledge and skills. As a contribution, this study helps to enrich the existing literature gap regarding the opportunities for creating competitive advantage in small firms (Bowman & Swart, 2007), particularly in export markets (Leonidou *et al.*, 1998). The associative and or cooperative enable training and guidelines for the quality demanded by the market, allowing decreases in operating costs, bargaining power and aggregation of value to production. In Brazil, it is also common for rural owners to seek to meet the quality demanded by the consumer market in an individual way, which provides a generally sustainable production and within the rules of good agricultural practices universally accepted. To face a globalized competition, the product strategies for the market positioning of the Brazilian coffee production should focus on the diversification and collective action of the actors. The value chain enables the spatial sharing of functions for production with cost reduction, as well as innovation and management technology with benefits in social capital, product quality, planning and financial management of the commodities, fairtrade and multi-certified property.

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