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**Quality Management Level of Brazilian
Coffee Business in Producing Regions**

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Quality Management Level of Brazilian Coffee Business in Producing Regions

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Abstract

In this study we identify the level of management of coffee farms in Brazil, and assess the profile of the quality management level of coffee businesses in the four main Brazilian coffee regions, however in more detail for the Minas Gerais State, responsible for over 50% of the volume and value of the Brazilian coffee production. We use the Model for Identification of Management Degree, the MIGG-Coffee. It establishes nine levels of management, ranking from the most primary to the highest one, considered as excellent. This method allows comparisons among companies, production processes, technological levels and regions. It assists in evaluating the competitiveness of local arrangements for sustainable regional development. This study presents the level of management, obtained through 239 questionnaires applied from May 2013 to May 2015. The results indicate that in regions dominated by family farms with less access to technology and information, and a low level of organization of cooperatives and regional associations, the management levels are, with few exceptions, lower than the national average. In regions with predominance of modern technologies and where there are cooperatives that historically provide information and technical assistance to farmers, the level of management is higher.

Keywords: Brazilian coffee, Coffee management, coffee production, farm management

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Introduction

The producer or a rural businessman as an agent of the agricultural production chain, in his work dispenses much of his time and energy to technical issues and conducting routine tasks, relegating to the background the administrative aspects of his activity. Thereby other important steps are harmed, such as planning and searching for information and compromising the activity as a whole (Bliska, 2010).

Despite the broad technical experience in cultivation, resulting from years of work, the management of the business is still, in most cases, primitive and intuitive. The use of information is done empirically, and grounded in feelings. Decision-making is not very rational, since it is not guided by methods that enables a systematic reproduction of processes.

A challenge for the industry is the training of rural businessmen, to assimilate it and apply the concepts of competitiveness, quality and management, replacing the simple idea of making a profit.

In the industrial processes, the maintenance of competitiveness is ensured by quality management, today omnipresent in all stages. It is only obtained through a continuous improvement process based on meeting the requirements of customers, adoption of innovations and rapid incorporation into the production process, reducing internal costs, increasing productivity, improving the image and accessing new markets. This process resulted in the creation of internal management systems essential to maintain or increase the competitiveness of micro and small businesses worldwide (Coltro, 1996; Correa, 2006; Bliska, 2010).

The issue has been extensively studied since the end of World War 2, in the 50s, during the reconstruction of Japanese industry from the American experience. Since that time the concern for quality management continuously grows between companies from different economic sectors. Several tools have been developed aiming at the application of the concepts of quality, until the product reaches the customers (Abrantes, 2001; 2009).

The companies of coffee production have a similar reality: the creation of internal management mechanisms is very important, from the improvement of agricultural processes, to product placement in the target market (Longo, 1995; Kiyuna, 2004).

The identification of the management level of the activities of those farms is obtained, simply and quickly, by applying the Model for Identification of Management Degree - MIGG contributes to the structuring of your business in an organized manner and to obtain finished products of superior quality.

Regarding the coffee production, since its introduction in Brazil in the early eighteenth century, in the North region, its cultivation has spread throughout much of the country. According to Bliska et al. (2012), from the beginning of coffee farming, the Brazilian production has developed with different costs and competitiveness, resulting mainly from soil and climatic conditions and different levels of technology, international competition and pricing, government incentives, investments in scientific and technological development, as well as different levels of entrepreneurship, which are

reflected in the level of agribusiness management and are extremely important to increase their competitiveness and survival.

Although its contribution has been historically important to the national economy, for generating the product, income and jobs, after decades as the main product of Brazilian exports, from the 1970s coffee exports started to lose importance (Vegro and Bliska, 2007).

However, Brazil is still the world's largest producer of coffee. In 2015 the Brazilian coffee production was estimated at 43.24 thousand bags of benefited coffee - 60 kg bags (CONAB 2015). Additionally, the coffee crop is still very important for the country, for the intensive use of manpower in most producing areas, especially during harvest time (Bliska and Vegro, 2011).

Domestic consumption is very large in 2014 it reached 4.89 kg of roasted coffee per capita, or 81 liters/person/year (ABIC, 2015).

Today, coffee cultivation in Brazil is concentrated in some regions of the following States: Minas Gerais, Espírito Santo, São Paulo and Bahia.

Each of these regions presents competitiveness and production costs differentiated by the use of different technological packages, resulting both from the soil and climate differences, such as the cultural aspects, land structure and level of adoption of technological innovations. In those states, 70% of coffee production comes from family farms, which account only for 30% of the volume of coffee produced in the country (Bliska et al., 2009).

Currently the main coffee region of Brazil is Minas Gerais State, where the cultivation of Arabica coffee predominates (*Coffea arabica*). In 2013 Minas Gerais accounted for 54% of the volume and 57% of the total value of the coffee beans produced in the country (*Coffea arabica* and *Coffea canephora*).

Considering only the Arabica coffee production, Minas Gerais accounts for 68% of volume and 70% of the value of Brazilian production (IBGE, 2015).

Considering the meaningful participation of those states in Brazil's in coffee production, the importance of each geographic region of those states, and the importance of creating internal management mechanisms for the coffee segment, since the improvement of agricultural processes to the placement of the coffee in the market, as well as for the competitiveness of farms, the aim of this study was to identify the management level of coffee farms in the states of Minas Gerais, Espírito Santo, Bahia and Sao Paulo and analyze the strengths and weaknesses of their management systems.

We analyzed, in more detail, the management level of Minas Gerais State, (and its productive areas), since this is the most important Brazilian producing region.

Materials and Methods

We used the Model for the Identification of Management Degree - MIGG, developed by Bliska (2010) and applied for coffee segment by Bliska et al. (2012).

The MIGG assists in gathering information addressed to the rural business manager, to help him to improve the business, turning it into an organized and

profitable company. It allows comparisons among companies, production processes, technological levels and regions. It assists in evaluating the competitiveness of local arrangements for sustainable regional development. It allows pointing out strengths and weaknesses and indicates corrective actions in maintaining and advancing processes quality.

MIGG uses a quick and easy to apply questionnaire, in order to classify management activities into nine different organizational levels, ranking from the most primary to the highest one considered as excellent.

The 64 questions that make up the MIGG questionnaire are simple, direct and admit only two answers: yes, or no. So the subjectivity that usually accompanies the descriptive or qualitative methods is minimized.

The developed script aims to continuously raise the quality standards at all stages of the production system. They are evaluated by eight criteria that are aimed at excellence in management: strategies and planning, leadership, customers, society, information and knowledge, persons, processes and results. These eight criteria are evaluated by a total of 64 indicators. Each indicator is represented by one of the 64 questions that compose the assessment questionnaire.

Each criterion provides the assessment of the responses from a sum of points, which amounts to a maximum of 1000 points.

The organization of the scoring system is based on the Excellence Model Management - MEG, developed by the National Quality Foundation (FNQ, 2007, FNQ, 2009). But the MIGG Coffee scoring system is weighted and distributed in accordance with the hierarchy of criteria specific to the coffee segment, according to the Delphi methodology (Bliska et al., 2012; Bliska et al., 2014).

The total points obtained in each questionnaire classify the management levels from one to nine. Level one is the lowest and represents the preliminary stages of management development and level nine is the highest and represents an organization that can be consider as "reference of excellence" in most areas, processes or products.

The characteristics and the scores for each of the nine MIGG Coffee management levels are presented in Table 1.

In this study, the MIGG questionnaire was applied to 239 coffee farms of the main Brazilian coffee regions, from May 2013 to May 2015: 106 in Minas Gerais, 23 in Espírito Santo, 86 in Bahia, 21 in São Paulo and 3 in Rio de Janeiro.

In general, the MIGG questionnaires were applied in loco through visits to farmers. At other times it was applied in the technical and scientific events, where questionnaires were available in printed form or on computers. And questionnaires were also applied online via the website of the Faculty of Agricultural Engineering / FEAGRI, the State University of Campinas / Unicamp.

Table 1. *Characteristics of the Companies in Each Level of Maturity Proposed by MIGG Coffee and Respective Scores*

Ranking	Organization's management maturity description	Score
9	Approaches highly proactive, innovative, continuous use, lifelong learning and fully integrated. Favorable trends in all results. Organization is "reference of excellence" in most areas, processes or products.	851 - 1000
8	Refined approaches, some innovative, with very widespread use. The organization is reference for excellence in many areas, processes or products.	751 - 850
7	The organization is a reference for excellence in some areas, processes or products.	651 - 750
6	The organization is considered one of the sector leaders.	551 - 650
5	There are gaps in the inter-relationship management practices. Favorable trend in most results.	451 - 550
4	Management practices are consistent with most of the organization's strategies. There are significant gaps.	341 - 450
3	Approaches appropriate for some criteria. There are positive results, but there are inconsistencies between the practices of management and strategies.	251 - 350
2	Early stages of development management practices. There are significant gaps to be addressed.	151 - 250
1	Preliminary stages of development management.	0 - 150

Source: Adapted from Bliska (2010).

Results and Discussion

The main results regarding the management level of coffee farms in Brazil are shown in Tables 2 to 6.

In Table 2 we compare the averages of the levels of management and the averages of the scores achieved in the most important Brazilian coffee producing states, and in their respective regions. In this table we can also observe the number of applied questionnaires in the most important region analyzed.

The average management level in Minas Gerais was 6.7. Its coffee production is spread across twelve production belts, of which the South/South West region and the Triângulo Mineiro/Alto Paranaíba region are the most important.

South/South West of Minas Gerais accounting for one quarter of the state's production. It is characterized by small producers. Its average management level, 6.4, was lower than that observed in the Triângulo/Alto Paranaíba. In the South/Southwest region the "Mountain" production coffee is predominant. It requires greater volume of manpower due to limited mechanization.

The average level in Triângulo/Alto Paranaíba is 7.1 and coffee farms are large and usually farming and harvesting are fully mechanized. This same characteristic is observed in a significant part of the remaining coffee regions

of that State, which resulted in average level of management, equal to 7.4.

Although Minas Gerais is the major Brazilian coffee producer, the highest average management level was observed in the Espírito Santo, the second largest producer, 7.1. In this State, the Central region stands out with a high level, 7.9, which is probably due to cultural aspects and remnants of colonization by immigrants, especially Germans and Italians.

In Bahia, farms had the lowest average level of management, 5.5. However, the West region stands out, with a very high average level of management, 7.8. In this region the farms are very large. Every crop is mechanized as well as harvested. In addition, the entire crop is under irrigation. So, the technology level is high. In contrast, the western region, the remaining coffee regions of Bahia are characterized by small farms.

Table 2. Average Management Level, Average Total Score and Sample Size of Coffee Farms in Minas Gerais, Espírito Santo, Bahia and São Paulo States May 2013 - May 2015

State	Geographic region	Average management level	Average total score	Sample size	%
Minas Gerais	South / Southwest of Minas	6.4	762.5	76	31.8
	Triângulo Mineiro/ Alto Paranaíba	7.1	705.7	14	5.9
	Other Minas Gerais regions	7.4	652.3	16	6.7
	Total	6.7	676.0	106	44.4
Espírito Santo	Central Espírito-santense	7.9	796.0	15	6.3
	Other Espírito Santo regions	6.4	642.5	8	3.3
	Total	7.1	727.4	23	9.6
Bahia	South Central of Bahia	5.3	509.6	75	31.4
	West	7.8	781.7	6	4.6
	Other Bahia regions	5.2	500.3	5	36.0
	Total	5.5	527.5	86	5.9
São Paulo	Campinas	6.2	628.2	14	2.9
	Other São Paulo regions	7.0	705.7	7	8.8
	Total	6.5	654.0	21	1.3
Brazilian average		6.3	628.2	239	100.0

The Brazilian region that obtained the highest proportion of the possible score was the Central region of Espírito Santo, with 79.6% of the total. The second highest score was obtained by the West region of Bahia, with 78.17% of the total. And the third was the South/Southwest of Minas Gerais, with 76.25%.

Therefore, except the Central region of Espírito Santo the lower management levels were observed in regions dominated by family coffee production, especially in the mountain areas where the mechanization of

farming and harvesting is limited.

Tables 3 to 6 show the maximum amount that each evaluated criterion could have achieved and the average values achieved in each coffee state. In all regions, the main weaknesses of the management systems are focused on the following criteria: strategies and plans, customers, persons and results. The main strengths common to all regions are related to the criterion of Society.

State of Minas Gerais

Currently the main coffee region of Brazil is the state of Minas Gerais. Table 3 shows that in the state of Minas Gerais all eight management criteria analyzed are higher in the Cerrado region - Triângulo Mineiro / Alto Paranaíba - than in the South/Southwest region, as well as higher than the state average. According to Bliska et al. (2009), in Minas Gerais, the medium and large farmers are concentrated in the part of Triângulo Mineiro and Alto Paranaíba known as Cerrado. The largest volume of production comes from those farms and in the Cerrado the average productivity is higher, resulting from the irrigation systems, spacing appropriate for mechanization of farming and harvesting, that is, predominate business management model aiming high yields. In the other regions of Minas Gerais predominate familiar management system of farms.

Table 3. *Management Level and Highest Possible Score in Coffee Farms in Coffee Regions of Minas Gerais State, May 2013 - May 2015*

Highest possible score	Criterion	Average scores: Minas Gerais State			
		State	South/Southwest	Triângulo Mineiro/Alto Paranaíba	Other regions
60	Strategies and planning	19.4	16.6	30.0	23.4
50	Leadership	42.8	42.1	44.3	45.0
90	Customers	55.3	51.9	61.1	66.6
60	Society	51.1	51.1	52.1	50.6
90	Information/knowledge	68.7	65.7	73.9	78.8
60	Persons	35.6	34.2	37.1	40.6
190	Processes	143.0	137.6	152.1	160.6
400	Results	260.0	253.2	255.0	296.9
1000	Total score	676.0	652.3	705.7	762.5
9	Management level	6.7	6.4	7.1	7.4

State of Espírito Santo

Espírito Santo is the second biggest Brazilian coffee producer. The differences among the coffee production systems in this state are very large. However the small farmers contribute the largest share of the total output. In the Central region all analyzed criteria are higher than the state average (Table 4). And six of them are higher than those observed for the other regions. As opposed to the regions of Minas Gerais and Bahia, where the highest management levels have been observed in areas of large farms, in the Central

region of Espírito Santo farms are generally small or medium.

Table 4. *Management Level and Highest Possible Score Total Score in Coffee Farms in Coffee Regions of Espírito Santo State, May 2013 - May 2015*

Highest possible score	Criterion	Average scores: Espírito Santo State		
		State	Central Espírito-santense	Other regions
60	Strategies and planning	22.2	25.0	15.8
50	Leadership	44.8	46.7	35.0
90	Customers	61.3	70.0	45.0
60	Society	53.0	53.3	53.9
90	Information/knowledge	75.7	81.0	58.3
60	Persons	42.6	44.7	45.0
190	Processes	152.2	170.0	127.8
400	Results	275.7	305.3	261.7
1000	Total score	727.4	796.0	642.5
9	Management level	7.1	7.9	6.4

State of Bahia

In the state of Bahia (Table 5), the coffee business predominates in the West region, with large farms and higher degrees of management, while in the South Central region of the state smallholders predominate and the management criteria showed lower values to those observed in other regions of the state, and is lower than the state average.

Table 5. *Management Level and Highest Possible Score in Coffee Farms in Coffee Regions of Bahia State, May 2013 - May 2015*

Highest possible score	Criterion	Average scores: Bahia State		
		State	South Central of Bahia	Other regions
60	Strategies and planning	24.2	24.0	25.6
50	Leadership	40.7	40.8	40.3
90	Customers	41.5	38.6	53.7
60	Society	31.3	29.3	39.6
90	Information/knowledge	61.2	58.7	71.7
60	Persons	26.4	24.5	34.5
190	Processes	99.4	97.2	106.8
400	Results	202.8	196.4	227.8
1000	Total score	527.5	509.6	600.1
9	Management level	5.5	5.3	6.1

State of São Paulo

São Paulo is the third largest coffee producer in Brazil (IBGE, 2015). Campinas is the most important coffee producer's region of the São Paulo

state. A large part of Campinas region is characterized by small traditional producers with a lower technological level than other regions. In Table 6 we observed that six of the eight analyzed criteria in the Campinas region are lower than those observed for the other São Paulo region. The exceptions are the criteria customers and society. Compared to the average values for the state of São Paulo as a whole, seven of the eight criteria analyzed are below the state averages. The only exception is the criterion customer.

Table 6. *Management level and highest possible score in coffee farms in coffee regions of São Paulo State, May 2013 - May 2015.*

Highest possible score	Criterion	Average scores: São Paulo State		
		State	Campinas	Other regions
60	Strategies and planning	18.6	18.2	19.3
50	Leadership	43.8	42.1	47.1
90	Customers	60.0	64.3	51.4
60	Society	51.9	50.0	55.7
90	Information/knowledge	70.7	66.4	79.3
60	Persons	36.7	32.9	44.3
190	Processes	134.8	125.0	154.3
400	Results	237.6	229.3	254.3
1000	Total score	654.0	628.2	705.7
9	Management level	6.5	6.2	7.0

Conclusions

The level of management of Brazilian coffee farms is very heterogeneous and the results obtained corroborate the thesis that, despite the technical expertise in cultivation, the management of the agricultural business is still primitive and intuitive for the most of the Brazilian coffee producers.

In regions dominated by small farms, with less access to technology and information, and with a low level of organization of cooperatives and regional associations, management levels are, with few exceptions, lower than the national average.

In regions with predominance of modern technologies and where there are cooperatives that historically provide information and technical assistance to farmers, the level of management is higher

The number of required corrective actions to raise the level of management of coffee farms in the Brazilian coffee regions is large. Much of those actions are more closely related to the organization and systematization of activities than to the financial input.

Considering the competitive advantages intrinsic to those regions, mainly soil and climatic conditions favorable to coffee plantations, it is concluded that the

coffee farms have great potential for response to corrective action, which may result on the increased productivity and economic return.

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