PERFORMANCE ANALYSIS OF APPLE PRODUCTION CHAIN: THE CASE OF SOUTHERN BRAZIL

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ABSTRACT

The context of globalization among other factors requires undertakings to formation of new arrangements in order to remain competitive on the market. The article had as objective to evaluate the competitive performance of Apple production chain in the southern region of Brazil, with reference to the largest producers in the States of Santa Catarina (SC), Rio Grande do Sul (RS) and Paraná (PR). The study used as a theoretical basis to systems theory, supply chain, diagnosis and performance of the production chain and, ultimately, Performance Indicators of quality, efficiency, equity, sustainability and competitiveness of the chain. To achieve the goals, the research was the qualitative type, with exploratory and operationalized through a case study. The data were collected through semi-structured, in-depth interviews with experts from Apple production chain. The analysis of the results of the interviews pointed out the negative and positive factors in the chain of Apple.

Keywords: Systemic Approach, Production Chain, Performance, Apple.

1. INTRODUCTION

The process of globalization, as well as the rapid technological changes, has required new forms of management incorporate in the business world. The transformations in the world competitive scenario, for example, oblige companies to establish cooperative relations, with a view to obtaining the necessary production factors to its maintenance and survival in the markets. In this context, one senses a change of focus in terms of competitiveness, (PANDAY; HANSEN, 1994).

The companies have sought to create ever more partnerships, formal and/or informal, with the goal of increased competitiveness in the markets, (AZEVEDO; MALAFAIA, 2007).

In this context this study had as its main objective to evaluate the competitive performance of Apple production chain in the southern region of Brazil, with reference to the largest producers in the States of Santa Catarina (SC), Rio Grande do Sul (RS) and Paraná (PR).

2. THEORETICAL FRAMEWORK

2.1. Study of the Productive Chain

The concept of the production chain (Filière) originates from studies of French industrial economy that favours the variable price in the process of coordination of the system, but assigns preference to distributive aspects of a given industrial product (BATTLE, 1998; MALAFAIA, et al, 2011).For Zilbersztanjn (2000), the production chain on systemic vision allows clipping of review, because depending on the objectives of the study, may or may not be included. Second Castro et al. (1998), the study of the productive chain may be located within the analytic space, bounded by external contours on which she is inserted.

Megido e Xavier (1994) destacam que as análises de Goldberg e Davis (1957), na década de 50, estabeleceram uma metodologia para o estudo da cadeia agroalimentar e/ou *agribusiness*, com o objetivo de analisar a complexidade das atividades do meio rural. Segundo os autores, *agribusiness* representa a soma total das operações de produção e distribuição de insumos agrícolas, armazenamento, distribuição dos produtos agrícolas.

Megido and Xavier (1994) highlight that analyses of Goldberg and Davis (1957), in the Decade of 50, established a methodology for the agrifood chain study and/or agribusiness, with the purpose of analyzing the complexity of rural activities. According to the authors, agribusiness represents the sum total of the operations of production and distribution of agricultural inputs, storage, distribution of agricultural products.

The diagnostic analysis of the production chain (FARINA, 1994; MEGIDDO; XAVIER, 1994) comprises the following actions:

I) General characterization of the production chain;

II) analysis of material flows and capital;

III) analysis of the quality of inputs and products;

IV) analysis of internal processes in the production chain segments.

Castro et al. (1996) say that the critical factors selected in this step must have quantified the behavior the past 5 to 10 years because it helps establish a historical trend that serves both to project future behavior as to anchor the estimates of alternative future behavior in scenarios of exploratory nature.

Verify to what extent the Organization's mission is being accomplished is the primary function of performance measurement, according to Miranda and Silva (2002). For Hronec (1993), performance measurements are the vital signs of the organization. According to Anderson et al. (2002), the excellent Manager should structure financial and qualitative measures, which have broad and systemic vision of the production chain prepared by Bonelli and Fonseca (2001).

2.2 Production Chain efficiency

In its most general formulation, the efficiency of a system is measured by the ratio between inputs (I) necessary for the formation of the product of the system and this product or output (O). Inputs and products should be measured in the same flow element (capital, energy, materials, information), which causes the efficiency is a dimensionless measure. (SPPEDING, 1975).

The productive chains are a specific type of system. The inputs are, in general, the chemical and mechanical energy, capital, information and matter, introduced into the system by human and animal labor; financial resources materials such as productive inputs and knowledge. Their outputs or outputs are similar to inputs (energy, capital, information, matter), but in the form of agricultural products and by-product.

The analysis of efficiency, when the focus is on the processor system of capital, can be operationalized by a financial analysis of revenues and expenses.

3. METHODOLOGY

The present study is characterized as to how to approach the topic, as a qualitative research, which, according to Scott and Mark (2001). With regard to objectives, the research is characterized as exploratory, (GIL, 1991. As regards the method used, the research is characterized as a case study, which, according to Yin (2001), aims to portray the reality of full and profound way. The study refers to the Apple production chain in the South, because the Apple is one of the main crops cultivated in the southern States of the country, Santa Catarina and Rio Grande do Sul, the largest domestic producers of fruit.

In the first step approached the theory to the basement of the article, in the second stage, in-depth interviews were conducted with five experts from Apple production chain. The process of sampling was probabilistic not for convenience. The primary data source was performed by semi-structured interviews. The interview involved conversation to two, with well-defined purposes,

characterized by verbal communication, when language and speech are fundamental elements in the collection of information relevant to specific topics. (MINAYO; DESLANDES, 1994).

The interviews were carried out with elements that make up the production chain, spanning from the supplier of raw materials, the producer, the packing house. After obtaining the data, content analysis was performed (BARDIN, 2004; FREITAS; JANISSEK, 2000), aiming to respond to the problem of research, as well as to the objectives already outlined. The experts interviewed are male, have age group average of 54.4 years and have years of experience averaged 26.4 in Apple production chain.

4. DATA ANALYSIS AND DISCUSSION OF THE RESULTS

4.1 Apple production chain performance

To evaluate the performance of the Apple production chain, experts of three States, namely, Paraná, Santa Catarina and Rio Grande do Sul, according to the degree of importance and performance, was considered by them in accordance with the stated in table 1:

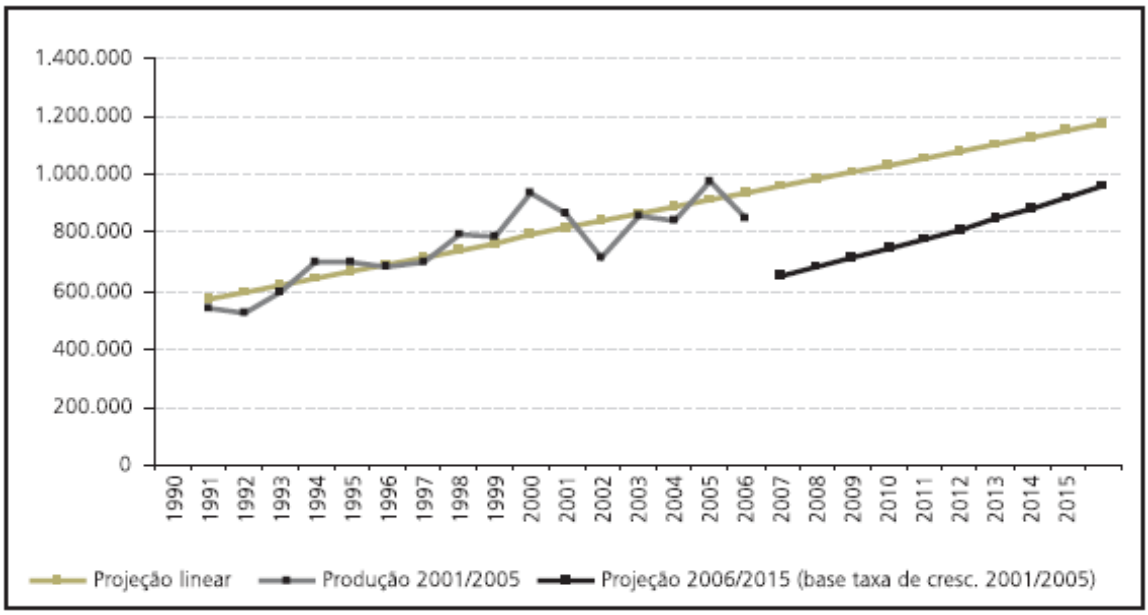
Table 1: Importance and performance

Degreeofimportance	Chain performance
5	VeryImportant
4	Important
3	Neutral
2	Unimportant
1	Unimportant

According to the respondents, the position of importance of Apple production chain was different for each of the three States considered. The State of Paraná has a 3.75 average index, which puts the importance and the performance as being neutral. For the State of Santa Catarina, the average index was 5, considered "very important" and, for Rio Grande do Sul, the average index was 4.25, which represents as being "Important".

Apple production in Brazil, in the Decade of 70, reached 3,263 t; in the Decade of 80, 183,299 t; and, in the Decade of 90, 519,845 t. The planting area had an increase of 53% when considered the period from 1990 to 2008. The production in the same period of 1990 to 2008 had an increase of 66%, which can be observed in Figure 1. All these indicators point to the significant increase of the productive efficiency of Apple in Brazil.

Figure 1: Brazil: projections for Apple production - 2015



Source: MAPA (2009).

In Figure 1, you can see two scenarios found in the survey:

I) In scenario 1, the linear projection for Apple production indicates that, in 2015, production will reach 1,175,152 tons, an increase of 22.48% in relation to 2006. This percentage shows-if possible by the significant adoption of technology incorporated into production processes in recent years. It should be noted that the production of Apple presents a significant technical support given by associations of producers and research institutions which have collaborated decisively for the generation and dissemination of technology among producers.

II) In scenario 2, registers a growth of 47.30% between 2006 and 2015, considering an annual growth rate of 4.40%. This scenario is unlikely, given that sustain that rate for almost 10 years, is incompatible with the current pace of investment in new orchards; In addition, it is likely that this expansion requires the expansion of areas intended for Apple, which in turn would require adjustments and further research, that are not ongoing. In fact, the agents of the production chain are aware that increased production would have serious implications for the placing on the market of the product, due to the difficulty in increasing internal demand and the restrictions imposed on exports of this fruit. (BUAINAIN; BATTLE, 2007).

The three big Apple producers in Brazil poles are, respectively, São Joaquim (SC), Cork (RS), and Fraiburgo (SC). (SIMIONI, PEREIRA, 2009).

4.2. Apple productionchainbehaviorbydegreeofImportance

The respondents, when asked about the behavior of the production chain, to take into account the indicators of growth, production, import, circulating capital, interest rates, export, market acceptance and new technologies and the degree of importance has already broken down in table 1, presented the following answers, according to table 2.

Table 2: Behavioral Items and degrees of importance

Items	**Degreeofimportance**
Growth	4.80
Production	4.80
Import	3.80
Circulating capital	4.60
Interestrates	4.80
Export	4.80
Market acceptance	4.60
New technologies	4.40

Source: survey data

In this sense, it is possible to identify that all indicators have a score above the level considered important as, for example, the growth, production, interest rates and export, when they appear with the highest scores.

Survey experts present, according to table 3, technological and non-technological bottlenecks that impact Apple production chain.

The main technological and non-technological bottlenecks impacting on Apple production chain listed are:

I) the high costs of planting and harvesting and labour in the production unit;

II) the lack of adequate training of workers in the production unit;

III) the high interest rates on bank financing, by inhibiting the production of same;

IV) the difficulties in obtaining bank credit;

v) low working capital of the producer.

According to Bittencourt and Mattei (2008), Apple production chain in Santa Catarina, especially the segment of the production, has some bottlenecks (lack of training costs, high interest rates), which affect its efficiency

4.4. Factors that limit the competitive performance of apple in the States of Southern Brazil

According to the assigned scores, Santa Catarina (48.63) again is presented first, followed by the State of Rio Grande do Sul (43.33) and Paraná (42.34).

Among the problems faced by the sector of the production chain of Apple, singled out by experts, are:

1. Lack of organization and dissemination;

2. lack of relationship between the links in the CPM;

3. lack of standardization, supervision by the Map;

4. lack of capital, reflecting on indebtedness;

5. lack of facilities and industrialization of derivatives;

6. excessive spraying of the offer;

7. lack of research for varieties with lots of cold requirement;

8. lack of cooperatives;

9. lack of facilities for storage and classification;

10. excessive bureaucracy of financial agents;

11. purchase concentration and lack of marketing;

12. low price at harvest;

13. costs;

14. foreign exchange;

15. climate.

The main suggestions identified by experts for the activity are:

1. Organization of products;

2. increase of cooperatives;

3. improvement in the standings and storage;

4. fruit products industrialization;

5. skilled labor in the distribution;

6. in the search marketing industry and fruit consumption policy;

7. Government oversight;

8. concentration of sales;

9. policy of control and planting;

10. dissemination of the benefits of regular consumption of fruits with specific marketing.

4.5. Scenarios for the Apple market experts

Three scenarios were elaborated in accordance with the opinion of the period 2015 to 2020:

I -Optimistic Scenario:

a. quality of the Apple;

b. skilled labor;

c. planting technology;

d. increased demandand productivity per hectare;

e. apple types planted;

g. competitiveness.

II - Neutral Scenario:

a. hectare planted;

b. time of receipt of the Apple until the final consumer;

c. the Apple harvest time;

d. productivity in the off season.

III -Pessimistic Scenario:

a. cost of Apple production.

With respect to competitiveness, experts observed that this occurs basically by climatic conditions and soil, where plantings are carried out, by the technological level and by meeting the requirements of the markets, which are reflected in production costs. This militated with Aquino and Benitez (2005).

4.6 Performance Indicators

Table 3 presents the indicators with average score, assigned by experts interviewed.

Table 3: Degree of importance of the indicators

Indicators	**Degreeofimportance**
Quality	5,00
Efficiency	4,80
Equity	4,00
Sustainability	4,80

According to table 3, experts confirm that the item quality is key to marketing the product, since this indicator is classified as "very important". Efficiency and sustainability appear with 4.80 degree that puts these indicators such as "Important" and "very important", due to being very close to 5.0. And the equity classification appears with 4.0 degree, placing it as "Important".

5. FINAL CONSIDERATIONS

The survey sought to assess the competitive performance of Apple production chain, in the southern region of Brazil, with the main municipalities in Santa Catarina, producers are Fraiburgo and São Joaquim and the State of Rio Grande do Sul, are Dairy and Bom Jesus. In this culture of generating 150,000 direct and indirect jobs (ABPM; Agapomi, 2009), except that, in Vacaria, is the predominant sector in the economy, being an activity of monoculture.

The experts pointed out that the problems faced by the sectors of CPM consist of: lack of organization and dissemination; lack of relationship between the links in the chain; Mapa; capital that is reflected in the debt; facilities and industrialization of derivatives; development of research for varieties of Apple in regions with low temperature; low temperature; cooperatives; excessive spraying of the

offer; excessive bureaucracy of financial agents; concentration of buying and marketing deficiency; high cost, foreign exchange and climatic variations.

The main suggestions for improvement that were identified by the experts for the fruit growing sector, are: Organization of products; increase of cooperatives; improvements in the classification, as well as in storage; industrialization of the Apple products. The experts emphasized the need for a policy of incentives and dissemination of the benefits of regular consumption of fruits, with the application of specific marketing, greater government oversight, sales concentration, and, finally, control policy, and planting.

Based on the results, we can say that the overall objective of this study, which refers to the competitive performance of Apple production chain in southern Brazil, in the view of experts was struck because it was found that the competitive performance of pomicultura has evolved significantly in recent decades, and that the increase in Brazilian production, based fundamentally on high productivity gains, expanded the internal offer of Apple.

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