Main Factors Affecting the Development of Interorganizational Partnerships in Biodiesel Supply Chain in Brazil

Eliene Cristina Barros Ribeiro, António Carrizo Moreira, Luís Miguel Domingues Fernandes Ferreira, Leonardo Leocádio Coelho de Souza and Aldara da Silva César

Abstract Partnership in supply chain stands out for the need to coordinate the productive activity between different economic agents who often have conflicting goals. Thus, the aim of this paper is to analyse how the partnerships producer/supplier are developed in biodiesel supply chain, through the motivating and facilitating factors that affect this relationship. The methodological aspect involves a multiple case study conducted in three supply chains located in the South Region of Brazil, which have used semi-structured interviews. We involved in this investigation the three largest biodiesel producer plants in the South Region and the two most representative cooperatives in providing raw material for each one of the selected plants, totalling six cooperatives. We realized through the found motivating and facilitating factors that, despite the existing conflicts, both plants and cooperatives have shown the desire to renew the partnership over time.

Keywords Supply chain · Partnership · Biodiesel

E.C.B. Ribeiro (✉) · A.C. Moreira · L.M.D.F. Ferreira
Industry Engineering, Management and Economics Department, Universidade de Aveiro, University Campus of Santiago, 3810-193 Aveiro, Portugal
e-mail: elienecbr@hotmail.com

A.C. Moreira
e-mail: amoreira@ua.pt

L.M.D.F. Ferreira
e-mail: lmferreira@ua.pt

L.L.C. de Souza
Universidade Federal do Maranhão, Campus of Imperatriz, Rua Urbano Santos s/n, Centro, Imperatriz-MA, Brazil
e-mail: leoleocadio@gmail.com

A. da Silva César
Agribusiness Department, Universidade Federal Fluminense, Avenida dos Trabalhadores, 420, Vila Santa Cecília, Volta, Redonda-RJ, Brazil
e-mail: aldaracesar@id.uff.br

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1 Introduction

The way organizations build their capacity to effectively manage partnerships in the supply chain has attracted researchers' attention over the past few years. Companies growing interest in investing in partnerships of producer/supplier type has been motivated by issues such as fierce competition, technological processes acceleration, as well as the growth of the social phenomena inside organizations (Ellram and Krause 2014).

Due to the issue complexity and the lack of investigations in various sectors of the economy, this study sought to characterize the producer/supplier partnership in the biodiesel supply chain in Brazil, focusing on the motivating and facilitating factors. According to Lambert et al. (1996), these aspects are justified because, to understand how the producer/supplier partnership influences the results, first, one must know the motivating factors, i.e. aspects that induced its formation in order to understand which the partners' expectations were. Enabling factors are used to identify features that stimulate or inhibit partnership, making possible a better understanding of the success or failure of the relationship.

The agribusiness sector, like other sectors of the economy, is subjected to several market rules, within a systemic and not isolated approach, adding more and more value to the generated products. Through this development, the sector is rethought, presenting itself as a segment of great economic and social importance in the global context (Watanabe et al. 2012). Family farming professionalization, management of cooperatives as important raw material suppliers, supply partnerships between large agribusinesses plants, cooperatives, and family farmers are aspects which are present and mark the management in agribusiness supply chains.

Partnership in the supply chain stands out as one of the possible ways to address the problems created by the need to coordinate the productive activity between different economic agents who often have conflicting objectives. Thus, new types of agribusiness relationships may have consequences for the stabilization of supply chains, managerial and technological qualification and territorial displacement of production companies as well as for generating a better response to the demands of the chain.

This paper is justified by the virtually absence of this kind of study in Brazil and in the world involving the biofuel production sector. Works done by Moharana et al. (2012) point out that, despite the interest of many agribusiness companies to get a closer relationship with their suppliers, factors such as the lack of commitment between the parties and the lack of confidence and difficulties in foreseeing gains have hindered such an approach, often leading to promising projects disruption.

In this scenario, this paper objective is to analyse how the producer/supplier partnerships are developed in biodiesel supply chain, through the motivating and facilitating factors that affect this relationship. For this, we have selected the partnership attributes that better suit this sector analysis and from them we identified the points which motivate, stimulate and inhibit partnerships development in order to suggest areas for improvement. Ellram and Krause (2014) report that the

relationship in the producer/supplier partnership has been more prominent in recent years, and this has led to the need of obtaining corroborative analysis of its application in various sectors of the economy.

2 Methodological Aspects

This study was based on the Brazilian biodiesel program called "National Program for Production and Use of Biodiesel". We analysed the producer/supplier partnership between biodiesel producer plants that are certified with the "Social Fuel Seal" (SFS) and cooperatives of family farmers that are raw material suppliers. SFS is a governmental mechanism that aims to put family farming in the supply chain of biodiesel producer plants. Thus, plants receive tax benefits and guarantees of selling their end product (B100 biodiesel) in auctions of the National Petroleum, Natural Gas and Biofuels Agency and they promote financially and technologically the strengthening of family farming and cooperatives.

As contributions of this paper, first this research provides a practical-theoretical approach to the selection of the partnership attributes that suit the evaluation of the biodiesel supply chain in Brazil. Partnership attributes were selected using the following steps: (a) survey of the partnership attributes most commonly used in agro-industrial chains; (b) in loco observation in the biodiesel producer plants, family farmers cooperatives, and eighty family farms and public institutions of the sector; (c) after the in loco observation, 25 attributes were selected among the most frequently used in the literature which suit the bioenergy sector; (d) the selected attributes were sent to biodiesel industry experts, who indicate the ones which are more related to the sector in accordance to this paper objectives.

These experts are two researchers from the biodiesel industry in Brazil; two agronomy engineers who provide technical assistance to the SCS program and two supply managers of two biodiesel plants located in the South and Northeast Regions; (e) after the experts analysis, we selected nine attributes which were used in this research.

The second contribution of this study is the application of the selected partnership attributes using semi-structured interviews, in order to evaluate the producer/supplier partnership development process in the biodiesel supply chain.

2.1 Units of Analysis

Units of analysis consist of three supply-chains located in the South Region of Brazil, involving: (a) the three biodiesel producer plants located in this region, which coincidentally are among the four largest biodiesel plants in Brazil (Granol, BsBios Petrobras Marialva, BsBios/Petrobras Passo Fundo)—these companies together account for an average of 40 % of the biodiesel produced in the country;

(b) the two most significant cooperatives supplying raw oilseed, which stand out for feedstock volume, delivery regularity and length of partnership, totalling six cooperatives. We justify the choice for the South Region because it presents the most developed family farming and cooperatives in the country, and it is also the region where 95 % of the biodiesel plants are certified with SCS, thus demanding raw material from the family farmers.

Interview respondent agents from the biodiesel plants were the supply managers and the agricultural technicians responsible for the technical assistance, in SCS parameters. Regarding the interviewed agents from cooperatives, we detach the cooperative managers and the agricultural technicians responsible for the technical assistance in accordance to SCS rules. The instrument used for collecting data was the semi-structured interview which addressed the "key informants". According to Malhotra and Grover, this approach means collecting data from people who work directly in the investigated area, since the research tool content requires specific knowledge of the sector.

Information analysis procedure is characterized by two analyses types: data triangulation and content analysis. Data triangulation involved the interview, the document analysis and the literature review. Based on the content analysis or data treatment, we tried to make the obtained data significant and valid. So inferences and interpretations were provided in order to achieve this investigation objective.

3 Analysis of the Partnership Attributes in Biodiesel Supply Chain

Partnership attributes were incorporated by Mohr and Spekman (1994), Walton (1996) when they investigated current and expected satisfaction in partnerships as perceived by businessmen and their suppliers and customers. In our study, we have incorporated coordination mechanisms referred by these authors as partnerships attributes, which are widely accepted in the literature, in order to analyse current and expected satisfaction of interorganizational suppliers and customers. From there, some investigations aiming to analyse the producer/supplier partnership has emerged, using attributes that were adapted to the analysed sector. This paper's objectives are focused on motivating and facilitating aspects adapted from Lambert model (2008), which will be analysed based on the partnership selected attributes for the biodiesel supply chain in Brazil, with its idiosyncrasies.

3.1 Trust

Based on authors like Morgan and Hunt (1994), Dyer and Chu (2000), for this analysis, trust is based on the disposition to count on a partner believing that he will

perform actions that will have positive results for both parties. In the analysed supply chains, trust was considered by cooperatives as the most important attribute for the development of a successful partnership. The action/result highlighted by cooperatives is directed to the fulfilment of the signed contract by plants. Regarding plants, we detected that trust is still incipient, because cooperatives have presented behaviours which are considered opportunistic.

3.2 Commitment

In this investigation, this attribute is seen as a continuing desire of maintaining a valuable relationship, with the appropriate behaviours as well as obligations and norms fulfilment (Morgan and Hunt 1994). For plants, the main lack of commitment action happens when cooperatives do not deliver the soybeans in the agreed volume, in favour of better export prices. So, due to this situation, plants have reported they do not commit to give up signing contracts with individual farmers until cooperatives deliver the amount of soybeans negotiated in the contract. This behaviour is seen by cooperatives as a competition of plants with cooperatives for family farmers and a decline in commitment.

3.3 Adaptation

For this investigation, adaptation attribute is analysed according to the concepts of Crotts and Turner (1999), Helfert et al. (2002) as the adequacy of suppliers to specific needs of clients and customers as well as the adjustments of clients to suppliers' capabilities. The main action regarding adaptation was the adjustment of the way they fill in the report on technical assistance that has to be sent to MDA every year. For cooperatives, reports are extensive and unviable, because each cooperative has between three and six thousands family farmers producing via SCS. Plants reported that the adaptation to the report template required by MDA is still an obstacle to the partnership relationship. The process of making five visits to each family farmer per harvest has not been done by most cooperatives. Plants understand that there is not a need for this type of procedure in the South Region, where soybeans farmers already have tradition and productivity, but they claim this is a requirement of MDA that needs to be fulfilled.

3.4 Information Sharing

In this research case, information sharing attribute, according to Mohr and Spekman (1994) vision, is the formal and informal sharing of meaningful and opportune

information between partners. A point highlighted by plants referred to the information given in advance about the soybean volume to be effectively delivered by cooperatives every harvest, which allows an effective internal planning. Some cooperatives have recognized this imperfection in the development of actions regarding information sharing and we perceived a conflict between plants and cooperatives on the necessity to give information, in advance, about the volume of soybeans to be delivered.

Another point regarding information sharing which was considered important by plants is the service reports to be sent to MDA. These are the main information-sharing tools that report all the phases of the technical assistance provided by the cooperatives to family farmers, as well as the amount of raw material produced and productivity. Plants do not consider this report important just because it is sent to MDA for SCS renewal, but also because it is a source of productivity and production information and because the production and marketing actions for the coming harvests are scheduled based on these data.

3.5 Cooperation and Conflict

To the cooperation and conflict dimension, we addressed Dwyer et al. (1987), Morgan and Hunt (1994) principles in which cooperation can be defined as a combination of efforts that reflect the joint expectations of partner companies in achieving mutual and individual goals over time. In this partnership, the authors consider the conflict pertinent in order to measure the total level of disagreement between partners, and it is considered beneficial in a cooperative relationship. In the analysed supply chains, we can verify the existence of cooperation, but always with the presence of conflicts, that are recognized by plants and cooperatives as inherent to the activity, in a region where the production of biodiesel and soybeans is very competitive.

3.6 Power and Dependence

The analysis of power and dependence attributes was based on the concepts of Mohr and Spekman (1994) in which power is the ability of a company to impose itself over the partner. The lower the dependence between the partners, the greater is the probability of a fair power application. Thus, we noticed that plants are more dependent on cooperatives. The large number of plants certified under SCS generates great competition for soybeans produced by family farming in the region. In accordance to the interviews, both plants and cooperatives understand that the partner has a certain degree of importance in the partnership, which gives each party different powers and a certain degree of dependence, and this, in the perception of respondents, reduces the possibility of predatory relationships.

3.7 Satisfaction in Partnership

Spekman et al. (1998) understand satisfaction as a key variable to determine whether a producer/supplier partnership will continue. Based on these authors, satisfaction was considered as a judgment of all the previous experiences obtained with a partner, reflecting the relationship results. We found that plants and cooperatives realize that the partnership has been developed over time, so that both parties report they are satisfied and understand that conflicts are manageable. Plants and cooperatives are interested in contract renewal and in increase the volume of raw material negotiated, assuming that adjustments and conflicts are inherent to the partnership.

4 Conclusion

We found out that the major inhibiting factor that is preponderant for biodiesel plants is the fact that cooperatives do not fulfil the delivery of the volume of soybeans agreed in the contract. In this sector, the economic gain directs more options that are aimed at cooperatives, because there is a great competition for soybeans produced by family farming in the region. Thus, it was noticed that the transactions are partly based in opportunism and not in trust and commitment building. As opportunism, in this investigation, we cited the partnership relationship in which one chooses to breach the signed contract to transact with another market player that offers a value higher than the one agreed.

It was also found out that plants are highly dependent on cooperatives, because there is a great competition for soybeans in the South Region. However, it was realized that there is a certain degree of dependence of cooperatives on plants, because there is an interest in a customer portfolio diversification and there is also the interest of family farmers and cooperatives in the financial bonuses received per sack of soybeans. Financial bonuses and contract fulfilment by plants were considered by cooperatives as the main motivating and stimulating factors for the partnership. Plants highlighted the quality of the soybean produced by cooperatives and the favourable distribution logistics as stimulating factors for the partnership, which reduces transportation costs for both sides.

Partnership assumes that conflict will occur, but this does not mean the absence of errors, since dealing with *commodities* that come from *agribusiness* is dealing with bad weather issues and consequently commercial ones. However, both sides have reported that it is important to give clear information. Partnership was considered satisfactory for plants and cooperatives, which have interest in contracts renewal, despite the existing conflicts, which both parties have considered as inherent to the sector and manageable. Partners exchange was considered a commercial setback both for plants and cooperatives.

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