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The effects of New Brazilian Forest Act in agribusiness chain structures

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The Brazilian agribusiness is an important activity to Brazilian economy. This sector represents 22.54 % of 2013 Brazilian GDP and is composed of different actors in each production agribusiness chains. This sector is growing year by year in terms of production thanks to technology adoption and production strategies. Environmental respect concerns (e.g. deforestation) are crucial to maintain sustainable growing of agricultural production. In 2012, the Brazilian Forest Act was update to deal with production and environmental preservation. Therefore, changes in institutional level affect agribusiness chain arrangements and actor's behavior. The aim of the work is to explore the changes in the agribusiness chain support structures and trade-off mechanisms emerging after the Brazilian Forest Act implementation. In order to dress this question, we use an internet survey to investigate Brazilian agribusiness actors' perceptions in different Federal States. The respondent reported mainly major changes in agribusiness identity support structures. They emphasize the emerging and needs of trade-off mechanisms in resources management and production proceedings to deal with Brazilian Forest Act. The sample also reported that the Brazilian New Forest Act leads to major changes at a farm level.

1. Introduction

Brazilian agribusiness Gross Domestic Product (GDP) has grown fast the last years. In 2013, agribusiness has reached 22.54 % of Brazilian GDP. The Brazilian agriculture annual productivity growth between 2000 and 2006 was 3.63 %. Agricultural land use also increased but less than land productivity. In 2006, the agricultural production covers 55 millions of hectares it means 7 % of Brazilian National Territory (IBGE, 2013). The Brazilian agribusiness is composed by different actors assembling in an agribusiness chain. The agribusiness chain can be defined by a group of activities interacting with each other from inputs supply to consumer (Zylbersztajn, 2005). The agribusiness chain includes activities of production and distribution of agricultural inputs, farms operations, storage, processing and distribution of agricultural products. Each activity, actor and their arrangement are important for agricultural agribusiness chain performance, including government efforts. Therefore, Federal and local laws impact directly actors' behavior and arrangements of the agribusiness chain (Araújo, 2007). The most important drivers in a Federal institutional level are Brazilian Agricultural Policy and Brazilian Forest Act. The changes of this Agriculture and Environmental Polices along the time affected the Brazilian land use, agricultural production and environmental preservation.

The first Brazilian Forest Code constrained farms' land use and stablished environmental preservation. It was published in 1934 by Brazilian Federal Act n. 23.739 in the Getulio Vargas government. In this act, for the first time the concept of "protected forests" rose. It was also instituted a preservation of 25 % farm land covered by native forests (CNA, 2011; PRAES, 2012). In 1965 this act was replaced by Federal Act n. 4.771 (PRAES, 2012). The new Act limited the uses of land and natural resources (CNA, 2011). The Act also introduced the concepts of Areas of Permanent Protection (APP) and Legal Reserve (LR). The first one aims to protect natural vegetation in the rivers' borders and top of hills on all land uses (farms included). The second one intends to preserve natural forests or vegetation on farms according to farm size and region. For instance, farms settled in the Amazonian Region needs to preserve 80 % of native forest area. Farms implanted in other biome regions were supposed to preserve 20 % (SPAROVEK et al., 2011).

In 1986 the law n. 7511 imposed new constraints in farm's forest preservation. The APP increased from five to thirty meters from the river's side. Farm crossed by rivers' width larger than 200 meters need to preserve the APP at least as large as river's width in both river's borders. A new revision of Brazilian Forest Act happened in 1989 by the Law n. 7803. This law obliges the preservation of 20 % of LR in Cerrado Region (mainly placed in the Center of Brazil, "Brazilian Savana´s"). The prohibition of the Economic use of LR was also a major change implemented by this law. Hills with altitude over 1800 meters, water springs and plateaus borders were also included as APP (CNA, 2011).

The last important change of the Forest Act happened in 2012. The law 12.651/2012 prescribe that farms with APP uses stablished before 2008 can maintain their activities in these areas if there are no risks in environmental and soil preservation. The APP size on the river's borders was reduced for small and family farms. These farms do not need to restore LR areas with the land use was stablished before 2008. The APP can also include in the calculation of 20 % of farm forest preservation. But deforestation of new areas was forbidden by this law.

The recent and major shift in BFA drive changes in agribusiness chain arrangements and actors behavior. With an original exploratory and descriptive purpose, the work aims identifying the major changes happening on Brazilian agribusiness chain thanks to this relevant update on the legislation. The aim of the work is to explore the changes in the agribusiness chain support structures and trade-off mechanisms emerging in this context. In order to dress this question, we use an internet survey to investigate Brazilian agribusiness actors' perceptions in different Federal States. A simple framework from management and organizational sciences is employed on the understanding of the main changes happening in the agribusiness sectors. The sample heterogeneity and size reach are also important originalities. We do not found publications with the same scope analyzing the effects on agribusiness chain of this recent institutional change.

2. Theoretical Framework

Different concepts and approaches can be used to study agricultural sector. The concept of Agribusiness, or agribusiness approach was introduced by Davis and Goldberg (1957). Agribusiness is considered the some of the production and distribution of agricultural inputs, farms operations, storage, processing and distribution of agricultural products (Cook and

Chaddad, 2000). The Commodity System Approach focuses the analysis on the subsequent operations of agricultural products transformation until the consumer (Cook and Chaddad, 2000). The "Filière" approach also named "agro-industrial chain" considers the study of 4 agriculture subsectors: downstream industries, agricultural production, upstream industries and food distribution (Batalha, 2009). These approaches disrupt with the tradition macro-economic view of sector based in agriculture, industry and service. They are useful to describe and understand the production process as a set of sequential and dependent operations.

Lazzarini et al., 2001 propose a "net chain" approach to study agribusiness sector. Their conceptual approach combine supply and value chain theories with a network analysis. The supply chain approach (SCA) is useful to understand and define the set of successive vertically organized transactions. These successive transactions require resource allocation agreements and informational flow between actors and organizations involved in this chain. The value chain analysis aims to identify and describe organizations and actor contribution in the value of the final good. In order to complement these approaches is important assessing the horizontal and vertical inter-organizational relationships and actors' network. The Net chain framework suggests an assessment of two distinguished levels of coordination: the horizontal and vertical links. The first is the analysis of the link between individuals or organizations playing the same role in the agribusiness chain e.g. farmer to farmer relationship. The second analyses the link between organizations and individuals playing different role on the agribusiness chain e.g. farmers to cooperatives relationship (Figure 1).

The Net chain approach supposes an inter-organizational network between different hierarchical levels in the agribusiness chain. Informal or formal contracts and legal security are the traditional support mechanisms driving the relations between the different actors of the agribusiness chain. Gonçalves (1990, 2009) proposes the analysis of 4 support structures on the understanding of agribusiness chain arrangements:

- Identity: It involves cultural determinants on the chain structure organization and operational stability of the chain. The identity is important for the net chain legitimacy.
- Relations: Perceptions and expectations drive the construction and cohesion of the interpersonal and inter-organizational relationship processes. They also drive the

establishment of the performance and the decision rules. Thus, the analysis of the agribusiness net chain relationships is an essential step on the comprehension of the chain value behavior.

- Proceedings: Understanding the process leading the management of supply and resources allocation on the production process is also a crucial step. The management proceeds established leads to a chain learning.
- Resources: The assessment of natural, economic, human and informational resources used in the chain production process of good and services is also necessary. The amount of these resources is a direct consequence of qualitative and quantitative demand characteristics. The agribusiness chain resources are responsible for the competitiveness and network synergies.

Resources, identity, relations and proceedings support arrangements can be affected by endogenous or exogenous chocks (e.g. institutional changes, news legislations, droughts, wars). The changing of these support mechanisms leads to trade-offs. New actors' behaviors, new modes of governance, new contracts and organizations are emerging trade-off mechanisms in order to compensate chocks effects. Gonçalves (1990, 2009) framework helps on the understanding of the effects of an institutional change on the agribusiness net chain legitimation structures. This frame also provides guideline to identify the raising trade-off mechanisms to compensate institutional changes.

The last major institutional change affecting the agribusiness net chain arrangements happened in 2012 with the Brazilian New Forest Act. Trading-off mechanisms taking place in the support structures of agribusiness net chain arrangement. In other words they affect the identity, the relations, the proceedings and the resource use of Brazilian agribusiness net chain. Our first exploratory hypothesis concerns the rise of environmental support identity on the Brazilian agribusiness chain. Thus, we supposed that beliefs of the Brazilian agribusiness chain actors and consumers preferences by environmental products are emerging. The second exploratory hypothesis looks into the changes on the relation support structures of the agribusiness chain. We supposed that new relationship formats (contract, agreement, partnerships, mergers and acquisitions) emerges a trade-off of law enforcement. The third exploratory hypothesis aim examines the changes on the proceedings support structure after this

institutional change. We expect the emergence of interest by new management systems and new production technologies for the economic valorization of preserved environment and the compliance with Brazilian Forest Act. Our fourth exploratory hypothesis expects the needs of new resources and skills to fit with this institutional change.

3. Methodology

3.1. The sampling

This paper aims to explain the effects of Brazilian Forest Act change on agribusiness chain structures. We used an internet survey to collect information's in order to explore the previous mentioned hypothesis. We ask for the trade-off mechanisms emerging in order to compensate changes in the support structures arrangement of Brazilian agribusiness chain.

No statistical data is provided by the government or institutions to analyze the consequences of the recent shift of Brazilian Forest Act. The internet surveys try to assess the agribusiness actor's perception about the consequences of this institutional change on agribusiness chain structures. A survey is a powerful method to raise important data when statistical information is not available. This is mainly the case of our study because the freshness of this institutional change. Internet survey can also be an important mean to reduce interview costs. At the same time an internet survey can reach a large number of people. However the representativeness of this kind of survey is limited for some contexts. A lot of people do not have access to internet or are not able to manage computers.

Using the previous theoretical approach, we consider the main actors of the agribusiness chain as: downstream industries representing agricultural input industries, farms, processing of agricultural products or agro industries, traders and distributors as supermarkets or retailers and consumers. Other intermediary actors have a less important role in the agribusiness chain. Google Docs tool was used in questionnaire applying and Microsoft® Office vs 2010 to the analysis.

The multiple choice questionnaire was composed by 3 parts. The first part concerning the personal characteristics of the surveyed people e.g. age, localization, professional activity, their relation with the agribusiness chain, their relation with the agro business sector, their preferences

as food as consumers, their knowledge about the Forest code and their perceptions about this institutional change. In this part of the questionnaire we also asked their perception about who will be the most affected actor by the New Forest Act. Another important question concerns their perception about the patterns and trends on the agribusiness chain. We ask for who influences more the productivity and organizational trends of the agribusiness chain. We ask for the use of a scoring in ascendant logic from 1 to 5 for all agribusiness chain actors': downstream suppliers, farming production, agroindustry, traders and supermarkets or retailers and government.

In the second part of the survey, we ask if they have observed changes occurring in the support structures cited in our framework e.g. identity, relations, proceedings and resources. In this part we try to identify the main changes happening in the agribusiness net chain (Table 1). The surveyed can answer yes or no in all questions.

The third part of the survey asks for the observed trade-off mechanisms eventually emerging due the Brazilian Forest Act and its updates, mainly the last one in 2012. In this part of the questionnaire we try to assess the major trade-off occurring on the distinguished support structures. In this part of the questionnaire the surveyed can also answer yes or no in all questions.

Firstly, 8 test surveys were applied to improve the clarity of the questionnaire. The survey average response time was 10 minutes. Secondly, the survey was sent to all contacts of the Center of Advanced Studies on Applied Economics (CEPEA) a part of Luiz de Queiroz College of Agriculture a campus of University of São Paulo. The survey was send twice to CEPEA contact list. The CEPEA sample was composed by: 8000 contacts from Brazilian horticulture and fruit sector, 5000 contacts to communication sector, 2700 contacts from beef sector, 300 e-mails from poultry and pork sector, 740 contacts from the cereal sector, 445 contacts from cotton sector and 310 from Cassava sector. This sample includes actors from different levels of the Brazilian agribusiness and also distinct agribusiness chains. The data was collected from 2013/06/04 to 2013/06/24. The survey was received by 16,624 contacts.

Thirdly, we selected only the responders related with agro-food sectors:

- Farmers, input suppliers, traders and supermarkets, agro industrial actors, consultants, professors.

- Consumers answer was also retained only if they have a relation with they confirmed a relation with agricultural sector
- Only correct, complete and coherent questionnaires was considered

4. Results and discussion

4.1. The personal characteristics of the sample

Our sampling considers actors from all distinguished sectors composing the Brazilian agribusiness chain. Only 2.92 % (485 individuals) answered the survey. 198 surveys were excluded considering the previous cited requirements. 287 answers were considered and its represents 1.7 % of 16,624 surveys sent. The sample is composed by answers of Eighteen Brazilian Federal States and from the Federal District. The states represented in the sample are: Acre, Bahia, Espírito Santo, Goiás, Maranhão, Minas Gerais, Mato Grosso, Mato Grosso do Sul, Pará, Pernambuco, Paraná, Rio de Janeiro, Rio Grande do Norte, Rondônia, Rio Grande do Sul, Santa Catarina, São Paulo e Tocantins. The largest part of the sample comes from São Paulo State.

The average of sample population age is 41 years old with a standard deviation of 11 years old. 80 % of our sample is male. 80.5 % coming from Brazilian High Revenue Layer according to criteria from IBGE (2013). The level of education is also higher compared with Brazilian average. 48 % of the sample concluded their bachelor and 35 % has masters or PhD concluded. Internet surveys have poor ability to sampling Brazilian population (Freitas et al., 2004; Carneiro and Dib, 2011). 87 % of our sample has direct link with one or more sectors of the agribusiness chain. 88 % of them are related with the farm production, 35 % with the agroindustry, 40 % with agribusiness trading and 31 % with inputs suppliers.

46 % of the respondents reporting a link with the agribusiness sector also stating that the New Forest Code has minor benefits. 25 % related that the New Forest Code affect negatively people working in the agribusiness chain. 14 % considers this institutional change will affect positively the activities of the agribusiness chain. Only 3 % setting that the new regulation is extremely profitable for the agricultural activity. The surveyed sample also classified the farm production as the main activity on the agribusiness chain affected by the New Forest Code.

171 people of our sample are farmers. 50 % of them related a negative economic effect of the New Forest Code on their activities. 17 % related a positive economic effect. 33 % do not know how this institutional change will influence their activities. In a hypothetic scenario of a lack of Forest Code 50 % of the farmers declared the conservation of their Areas of Permanent Protection (APP). This clearly represents an environmental awareness of a half of the interviewed farmers. 18 % of farmers would not know what to do in this hypothetical scenario. Only 3 % reported an extension of agricultural production under APP.

Regarding to our sample consumption origins preferences, the most part of respondents says concerned about the origin of their food. 37 % of the sample says that they look for food origin information in the product packaging. 28 % say they do not look for product origin. The others say that they would like to know the origin of their food but they cannot find food origin in the product. Still relating to consumer's preferences the most important attribute is the quality and in the second place the price. In the respective order, food not related with deforestation, organic products, with social-environmental label are the other attributes influencing consumer food choice. They have almost same relevance degree when compared each other and a high standard deviation. But, the degree of relevance of these 3 attributes on the consumer's preferences is minor in comparison with quality and price attributes.

Relating to information about the Brazilian Forest Code our sample related incomplete and asymmetry information. 61 % of our sample reported a good quality but incomplete information about environmental law. 21 % announced a lack of information on the understanding of the New Forest Code. But 64 % affirm to have a basic knowledge about the topic. Fernandes et al. (2008) conducted an interview with 1028 people in the Espírito Santo State. They concluded that interviewed people have basic knowledge about environmental laws. 86 % answered that they do not follow the news about this subject. This behavior is complementary to the fact that the biggest part does not give priorities to products origins and certifications.

In regard to the perception of our sample about who influences more the productivity and organizational trends of the agribusiness chain, we separate the actor's perceptions in 2 groups: one for the farmers and other for downstream suppliers, agroindustry and traders/retailers actors (Table 3). Both groups reported a strong influence of traders/retailers on the productivity and organizational trends. They also consider that Agroindustry and Policy have a high impact in the

productivity and organizational trends of the agribusiness chain. The influence of farmers and downstream suppliers was not high scored.

4.1. Major changes observed in the agribusiness net chain

Firstly, we present the results about the main changes observed by the responders in the support structures of the agribusiness chain after Brazilian Forest Code Approval (Table 4). 85.9 % of interviewed people related changes observed in the support structures of the agribusiness net chain. Only 14.1 % didn't observed changes in the support structures. Greater interest in certifications (farm, products) was the most related change observed follow by greater interest in product traceability. These results suppose major changes happening in the identity and in the relations of the agribusiness chain. Even if secondary, the consumers preferences by food no related with deforestation, organic products, with social-environmental label can also sustain the hypothesis of identity and relation changes happening the Brazilian agribusiness chain.

Our survey also shows evidences of changes identity in the agribusiness chain from the farmer side. 70 % of the interviewed sample declares an observed change in the farmer's behavior related to compliance with the New Forest Act. In a hypothetic scenario of a lack of Forest Code 50 % of the farmers declared the conservation of their Areas of Permanent Protection (APP). This clearly represents an environmental awareness of a half of interviewed farmers.

The observed increasing demand for contracts requiring compliance with the New Forest Act (9.7 % of respondents) can also support the compelling hypothesis of the change on the agribusiness relation. Moreover 62 % of the farmer's respondents related no changes in the requirements of compliance with Brazilian Forest Act from the buyer's side. Only 16 % declared a raise in the requirements in formal environmental terms in contracts and 10 % informal oral environmental terms in contracts. Concerning input suppliers (and input industries), agro industries, traders and retailers, 56 % of them declared no environmental requirements from their customers. And, 73 % of surveyed people of this group declare continuum efforts to meet environmental demands.

Thus, these results support our hypothesis of major identity changes in Brazilian agribusiness chain after Forest Act approved. Interviewed declared increasing in actor's environmental

friendly behavior. Although the less obvious, surveyed people also evidenced changes on the relation level of Brazilian agribusiness chain. These results also presume the need for trade-off mechanisms emerging to compensate these greater changes in the agribusiness chain.

The Forest Act imposed a limitation of resource uses, mainly in the land use. It can play a role on the increasing interest by increments on land productivity by technological proceedings. It can also explain the upward interest for the economic valorization of the environment protection and how the scientific research can contribute to this topic. 34 % of the interviewed sample reported increases interests on information about new resources or proceedings to compliance with New Forest Act (Questions 2M, 3M, and 5M). A raise on the interest about the information relating to Government supports on the environmental protection was also observed on this survey (Question 1M). The results of this survey allow us identifying changes in the proceedings and resources structures in the agribusiness chain.

4.1. The main trade-off mechanisms

The third part of the survey asks for the observed trade-off mechanisms eventually emerging after the Brazilian Forest Act was approved in 2012. In this part of the questionnaire we try to assess the major trade-off occurring on the distinguished support structures. 81.21 % of interviewed sample reported emerging trade-off mechanisms on the agribusiness net chain (Table 4). Only 18.79 % did not observed emerging trade-off mechanisms. The trade-off mechanisms are mainly observed in the proceedings and resource structures of the agribusiness chain. The most highlighted trade-off emerging mechanism is the certification followed respectively by new farming systems, new sustainable management systems of forest areas and new management methods. The training of employees was also a trade-off mechanism observed by 9.9 % of the sample. These results confirm our fourth hypothesis of important new skills in resources management and proceedings emerging in order to complain with the requirements of Brazilian Forest Act. Operations as acquisitions or fusions, cooperation or association, or still the raise of new logistic actors do not seem be relevant trade-offs for the surveyed population.

5. Conclusion

The Establishment of Brazilian Forest Act in 2012 was a major institutional change affecting all agribusiness chain. By one hand, it can be useful to make clear the environmental protection of agricultural production. By other hand it had strong effects on the support structures of the agribusiness chain. Agribusiness actor's was also affected, mainly farmers. A lot of trade-off mechanisms are emerging to compensate this changes and to the compliance with the law.

This paper explores the Brazilian agribusiness actors' perceptions about the effects of the last version of the Brazilian Forest Act (2012) on the agribusiness chain support structures. Organizational and management sciences framework was employed to study the main changes and trade-off mechanisms observed in the agribusiness chain. Internet survey was sent to more than 16.624 actors of the Brazilian agribusiness chain. The data was collected from 2013/06/04 to 2013/06/24. We received only 485 surveys and 287 of than was explored.

Surveyed sample reported major changes in agribusiness chain support structures, in actors' behaviors and the raise of trade-off mechanisms in order to complying with Brazilian New Forest Act. The sample also stated the farm production as the most impacted level in the agribusiness chain. They also reported a strong influence of traders/retailers followed by Agroindustry and Policy on the productivity and organizational trends of the agribusiness chain.

We found evidences in the sample responses corroborating our first exploratory hypothesis of a rise of environmental new identity on the Brazilian agribusiness chain. They reported emerging beliefs in the Brazilian agribusiness chain actors. In their consumers' preferences they also reported awareness for environmental characteristics of the products. Greater interest in certifications, by product traceability and environmental friendly products are also states emerging changes in the agribusiness chain identity. 50 % of farmer's respondents also reported the conservation of their Areas of Permanent Protection (APP) in a hypothetic scenario of a lack of Forest Code 50 %.

We also found evidences exploring the second hypothesis about the changes on the relation structures of the agribusiness chain. 16 % of farmers reported observed increases in environmental terms of the contracts. The sample also reported major evidences concerning our third and fourth exploratory hypothesis. They evidenced the requirements of new proceedings in the production and resource (mainly managerial skills) to the compliance with the law. The

sample highlighted emerging trade-off mechanisms as certification, new farming management systems and employees training in order to fit with this institutional change.

This work use network and organization concepts on the construction of an original approach in order to assess the main changes emerging in the agribusiness sector with the new Forest Act. In fact, this work allows us to explore and identify the main changes happening in the support structures of the agribusiness chain. We can also identify the main trade-off mechanisms emerging to compensate these changes. Exploring the opinions of different actors of the agribusiness chain in a lot of Brazilian Federal States is also a strong originality. But the low representativeness of our sample limits the generalization of our results. The lack of homogeneity in the sample of agribusiness actors' categories (downstream suppliers, farmers, agroindustry and traders/retailers) makes the identification of the level with more emerging trade-off mechanisms difficult. Moreover, we do not use probabilistic sampling and the internet surveys reach only a small portion of the population. Greater regionalization in a state or regional level and a segmentation of the population studied may be useful to improve the generalization of the conclusions.

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Tables and Figures

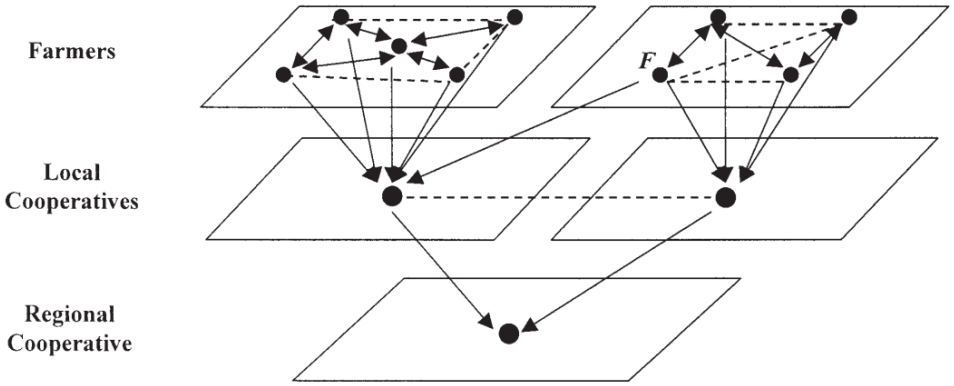

Figure 1 – The Net Chain Approach
Source: Lazzarini et al. (2001).

Table 1: Questions about the main changes observed in the agribusiness chain and their relation with the support structures

Major changes observed in the agribusiness net chain	*Support structures affected*
1M-A raise on the interest for forest markets and or environmental products (carbon and forest offsets markets)	D
2M-A raise on the interest for Government supports (credit lines, subsides, others)	CD
3M-A raise on the interest for productivity technologies	CD
4M-Greater interest in certifications (farm, products, others.)	AB
5M-Greater interest in research/scientific development	BCD
6M-Greater interest in product traceability	ABC
7M-Increased demand for contracts requiring compliance with the New Forest Code	AB
8M-Raise of new organizations to meet these new demands	ABCD
9M-Others changes	
10M-No change observed	

A= Identity; B = Relations; C = Proceedings and D = Resources

Table 2: List of questions with the trade-off mechanisms eventually emerging after the New Forest Code and its relation with the support structures

Observed trade-off mechanisms emerging	***Support structures affected***
1T-Certifications/ Certificates	ABC
2T-Cooperation/ Association	BCD

3T-Merging/Acquisitions	BCD
4T-New partnerships	BCD
5T-New management methods	C
6T-New farming systems	CD
7T-New sustainable management systems of forest areas	CD
8T-Employees trainning	D
9T-Hiring	D
10T-New business (concessions, condominiums)	D
11T-New Logistic Actors	BCD
12T-Other trade-off observed	
13T-No trade-off observed	

A= Identity; B = Relations; C = Proceedings and D = Resources

Table 3: The sample' perception about agribusiness actor's influence on productivity and organizational trends on the agribusiness chain

Farmers					
	Downstream suppliers	Farmers	Agroindustry	Traders/retailers	Policy
Average	2,41	2,47	3,67	3,78	3,05
Standard Deviation	1,21	1,26	1,27	1,12	1,37
Variance	1,94	2,03	2,10	1,82	2,46
Downstream suppliers, agroindustry and traders/retailers actors					
Average	2,60	2,63	3,71	3,74	3,34
Standard Deviation	1,27	1,27	1,28	1,24	1,36
Variance	2,13	2,12	2,15	2,02	2,38

Table 4: Survey results about main changes observed in the agribusiness chain and their relation with the support structures

Major changes observed in the agribusiness chain	***Results***	***Share***	***Support structures affected***
1M-A raise on the interest for forest markets and or environmental products (carbon and forest offsets markets)	55	9.9%	D
2M-A raise on the interest for Government supports (credit lines, subsides, others)	67	12.0%	CD
3M-A raise on the interest for productivity technologies	73	13.1%	CD
4M-Greater interest in certifications (farm, products, others.)	79	14.2%	AB
5M-Greater interest in research/scientific development	50	9.0%	BCD

6M-Greater interest in product traceability	75	13.4%	ABC
7M-Increased demand for contracts requiring compliance with the New Forest Code	54	9.7%	AB
8M-Raise of new organizations to meet these new demands	22	3.9%	ABCD
9M-Others changes	4	0.7%	
10M-No change observed	79	14.1%	
TOTAL	**558**	**100%**	

A= Identity; B = Relations; C = Proceedings and D = Resources

Table 5: List of questions with the trade-off mechanisms eventually emerging after the New Forest Code and its relation with the support structures

Trade-off mechanisms	***Results***	***Share***	***Support structures affected***
1T-Certifications/ Certificates	90	15.10%	ABC
2T-Cooperation/ Association	24	4.03%	BCD
3T-Merging/Acquisitions	11	1.85%	BCD
4T-New partnerships	39	6.54%	BCD
5T-New management methods	66	11.07%	C
6T-New farming systems	74	12.42%	CD
7T-New sustainable management systems of forest areas	69	11.58%	CD
8T-Employees trainning	59	9.90%	D
9T-Hiring	12	2.01%	D
10T-New business (concessions, condominiums)	28	4.70%	D
11T-New Logistic Actors	8	1.34%	BCD
12T-Other trade-off observed	4	0.67%	
13T-No trade-off observed	112	18.79%	
TOTAL	**596**	**100%**	

A= Identity; B = Relations; C = Proceedings and D = Resources