

**GOVERNANCE IN THE BEEF SUPPLY CHAIN:
An Exploratory Study of Sustainable Production Standards Practiced In the Northern Region of Mato Grosso**

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ABSTRACT

In order to keep the exporting market of Brazilian beef, the agents of that chain need to be aware of the requirements from import countries, especially regarding the production within the sustainable standards. The beef from Legal Amazon has been a steady subject for this debate. Within this focus, the current study aims to explore the use of sustainable production standards by agents involved in the supply chain of the beef produced in the northern region of Mato Grosso State. The methodology was the qualitative research of a case study. In order to compound the research, a slaughterhouse, a feedlot, an association creators and individual cattle breeders, all acting within the area covered by the Legal Amazon, were selected. The results showed that the agents who take part of this chain are concerned about meeting the standards required by the importing market, but they come across with difficulties on obeying such requirements. Limitations of study is because it is based on a solely case study and research only applied in one municipality of the Amazon Region.

Keywords: *sustainable production standards, governance, supply chain, beef.*

1. INTRODUCTION

Over the last years, Brazil has maximized its beef exports by opening markets non attended previously. On the other hand, studies show that livestock is considered one of the main causes of Brazilian Legal Amazon deforestation (Arima, Barreto, & Brito, 2005; Ferreira, Venticinque, & Almeida, 2005; Rivero, Almeida, Ávila, & Oliveira, 2009, Mota & Gazoni, 2012). Thus, the need to elaborate in depth studies on beef chain, that presents problems concerned to the coordination of its links. One of the probable reasons would be the fact that Brazil has wide extensions and very heterogeneous agents involved in the chain. Another reason would be the improvement of private rules, where many important decisions concerning risks of food security, environmental impacts and public health, are increasingly present in the scenarios of global agro-food chain. In this approach, evaluating aspects of governance improvement in agro-food chains is one form to detect probable opportunities and threats to the implementation of an institutional policy aligned to sustainability in food production.

Due to given pressures in national as well as international environment, above contextualised, there is no consensus, or even, a huge understanding on literature, about which would be the initiatives created to meet or smooth such pressures that evoke the production from agro-food chain of Brazilian beef according to sustainable standards.

Under this perspective, some authors (Shepherd & Wilson, 2013; Maertens & Swinnen, 2009; Henson, 2007; Hatanaka, Konefal & Cosntace, 2012; and Schuster & Maertens, 2013) highlight that there are research lacks in developing countries, like Brazil, related to adequacy to exporting standards required by importing markets, among them the European market, which need to be better investigated. For instance, Shepherd and Wilson (2013) discuss that barriers to access like fees and quotes fell down in many countries over the last decades, but attention turned to other regulatory measures like product rules, which has the potential to act with commercial barriers.

On the other hand, Maertens and Swinnen (2009) and Henson (2007) affirm that the foreign rules can also act as a catalyser to improve production, as resources to change the way producers produce by adapting to the required techniques.

In their study, Hatanaka, Konefal and Cosntace (2012) raise that, although there is a significant unit of researches on alternative implementation in agro-food governance mechanisms, there are few researches on such instruments development. Specifically, regarding the fundamental matters on which standards which govern the agro-food chains are developed, like different actors, advance, negotiate, their commitments and like power unbalance, are managed by actors. Schuster and Maertens (2013) add by pointing out the need of research on private standards and their effects on agro-food supply chain in developing countries, and still add, that is a space for researches faced to social order standards, especially in terms of effects on labour market or environmental behaviour.

Before the presented context, in order to keep the exporting market of Brazilian beef, this chains agents need to be aware of the importing countries requirements, especially regarding the production according to the sustainable standards. The beef from the Legal Amazon has been subject in this continuous debate. In this perspective, the present study aims to explore the use of sustainable production standards by agents involved in that chain in the northern region of Mato Grosso State. In order to compound the research, a slaughterhouse, a feedlot, an association of individual creators and cattle breeders, all acting within the area covered by the Legal Amazon, were selected.

In order to meet the proposed objective, the current study is organised in four sections besides this introduction. The following section was constructed by means of the main propositions of authors in this field, involving the concepts on Supply Chain Management, Governance and Sustainable standards. Further, the methodological procedures employed in the research development are introduced in detail. The following section presented the data and results were discussed from the analysis of the interviews to different actors involved in the process. Ultimately, there are final considerations of the study to show this researchs contribution for the context of the different actors governance in the use of sustainable standards in Brazilian beef production.

2. SUPPLY CHAIN MANAGEMENT

Supply chain management is based on the principle that supply relationships are only part of a long suppliers chain to final clients; the wide view of supply chain is supposed to reveal the potential for costs reduction and value creation through several suppliers (Johnsen, Harland & Lamming, 2008). The upstream and downstream relationships management with suppliers and clients to deliver to client a superior value at low cost for supply chain as a whole is a concept worked by Christopher (2005) for the term Supply Chain Management.

The definition given by Alfalla-Luque and Medina-Lopez (2009) is the result of the analyzis of 19 studies conducted between 1985-2005, in which the authors concluded that supply chain management is the integration of all activities related to goods flow and transformation, including the associated information flows, from raw materials to final user, to reach a sustainable competitive advantage.

The main theory that can be applied to understand practices to incentive this theme is the Transaction Costs Economics (Johnsen, Harland & Lamming, 2008). The researches on the Transaction Costs Theory started with the work “The nature of the firm”, Coase later conducted by Williamson North and other authors. The studies on this theory within the agrobusiness context have significantly contributed for the sector organizational development and growth.

Williamson (1989) explains the adoption of the organizational arrangement in function of assets particularities. The higher particularity of assets involved in goods production, the stronger are the incentives to have a structure of unified governance. The assets particularity can be ordained in six types: (1) locational particularity, when the agents are closer to each other in order to reduce transportation costs; (2) physical particularity, when specialized pieces or mouldings are required to produce a determined component; (3) human particularity, that rises from the learning by doing idea; (4) dedicated assets, when specific investments are made for determined objective, for certain client; (5) brand; and (6) temporal specificity (Vinholis, Souza & Souza Filho, 2010).

In agribusiness, the most important assets particularities are of locational, physical and temporal types. From these, most times the temporal results from perishability and climatic conditions that influence the quantity and quality of agricultural products. Another factor refers to investment in knowledge, processes and equipment assigned to the reduction of variability in product quality (Raynaud, Sauvée & Valceschini, 2009; Vinholis, Souza & Souza Filho, 2010).

Davis and Goldberg (1957) approached that the companies involved in the process of production and delivery of agro-food products for human consumption in a society, are jointly called agro-food supply chain. This complex interorganizational chain involves the following organizations our stakeholders: farmers; agro-food industry and distributors. Before the exposed, the following topic seeks to clear on agro-food chain.

2.1 Agro-food Chains

The agro-food chain represents a series of operations that lead to good production, whose articulation is widely influenced by the technological possibilities and defined by the agents strategies. These have interdependent and complementary relationships, determined by the hierarchical strengths (Morvan, 1985).

The evolution of the analysis of the productive relationships in agro-food chains starts with Davis and Goldberg (1957) and Godlberg (1968), influenced by the studies on intersectorial relationships brought by Leontieff. In the 1970s, it appeared an important trend on chain approach in Yon, Malassis studies and, more recently, Floriot (1986), in France (Zylbersztajn, 1993).

Souza, Souza Filho, Serra, & Boris, (2005) report in their study that the analysis of the agroindustrial productive chain enables the comprehension of its structure and functioning and that each segment must be examined - insume suppliers, producers, processing industries, distributors (wholesale and retail), as well as the way to promote companies intra and inter interaction, in order to enable the description of conditions in which market dynamics, governmental rules and other factors influence companies performance.

Along the last decade, the tendencies more highlighted in global agro-food chain have been the increase of product quality and the concern on spreading the private food security, changing the game rules for processing organizations as well as producers. And still, the spread of standards is rooted in the restructure of consume market, in the competitive dynamics of retail sector and the regularization of the quality guarantee by public authorities to retailers and certification bodies (Ouma, 2010; Humphrey & Schmitz, 2000; Lumineau & Hederson, 2012; Mcdermontt, Irland & Pacheco, 2013).

Specifically in beef chain, focus of this study, some obstacles to be overcome are related to surpassing sanitary barriers, the development of a quality standard and its validation by the importing market, the construction of a better coordinated chain, the surpassing of exporting limiters, such as quote fees and subsidised competition, and also placing major valued products in market (Ceolin, 2011). For this, the following topics will seek to bring a bit clearance on governance and sustainable standards, focused in this study.

2.2 Governance and Supply Chains

The governance is the form of coordination between companies (Gereffi, Humphrey & Sturgeon, 2005). It regards to the institutional structure in which the integrity of a transaction (or a set of transactions) is decided (Williamson, 1996). In this case, governance aims to effectively integrate the business processes, costs reduction and the construction of the competitive advantages for their members in an interorganizational relationship (Cooper & Ellram, 1993; Croxton, Garcia-Dastugue, Lambert, & Rogers, 2001).

For Humphrey and Schmitz (2000), governance in global supply chains is defined or determined by the dominance of global actors who operate in the name of large retailers and holders of global brands and to whom the full power exercise related to managing the access to market is suitable; the determination of relationship style and the earnings distribution in network.

Vermeulen and Sauring (2009) complement that these initial forms of governance in sustainable supply chain need to be temporally developed, making the approach standards established by unique organizations migrate to approach with joint regulations, valuing the aspects of organizational integration, processes efficiency and capacity to generate value for the whole chain. The following topic depicts the urgency of sustainable production standards, even increasingly claimed by consuming market.

2.3 Sustainable Standards

The standards are present in any market economy, as smooth form of regulation, becoming even more important regarding national as well as international market (Busch, 2000; Timmermans & Epstein, 2010). Standards are consisted of recorded agreements with technical specifications or any other specific criteria to be consistently used, as rules, guidelines and definitions, to that materials, products, processes and services are compatible with their goals (ISO, 2014). Henman and Dean (2010) and Ponte and Gibbon (2005) add by means of their researches that the standards are defined and managed within a system of rules, conventions and values liable to be reviewed and tradable, rather than being absolute.

The set up of rules and their revision involve classification and categorization, exclusion and inclusion of limits, definition of measure devices and intervals, and the selection of the type of expertise and specialized knowledge in which it will be signed up. However, knowledge is not simply a “recipient” that the authors offer, but also which is generated through interaction. In this context, managing the process of standard creation and revision is in itself an essential element of governance for sustainable chains (Ponte & Cheyns, 2013).

Bain, Ransom and Higgins (2013) reported that in the agro-food sector, the standards are part of the infrastructure that coordinates the production and distribution of agricultural products. Until the late 1990, bulk products (grains, cotton, cocoa) dominated world trade. In order to ease this commodity market, reduce transaction costs and increase market efficiency, public standards were developed, and the focus of these standards were on products (for example: pesticide residues, moisture colour and content), which could be easily measured in order to ensure the uniformity and consistency of the product. However, this has changed in recent decades, where the standards concern turned to social and environmental issues (Bain, Ransom & Higgins, 2013; Challies, 2012; Ransom, Bain & Higgins, 2013).

At this point, it is highlighted that agro-food standards have been recently reoriented to production differentiation and indicated as attributes of credibility or extrinsic quality associated with integrity in the process of production of products. As a result of this new trend, the standards and labels (social and environmental) of sustainable agrifood sector have proliferated. The researchers believe that the private sustainability standards are an effective means for internalising social and environmental externalities of global capitalism, in order to achieve a sustainable agro-food system (Challies, 2012; Bridge & Cheyns, 2013)

Henson and Humphrey (2010) point out three main variations of standards applied globally in agrifood chains. The first identified is the individual standard, which is developed by individual organizations, usually represented by large companies, retailers who apply the norms throughout their chains. These patterns are most often communicated to consumers by creating brands and stamps in their own products. The second mode is the collective national standards, in turn, are developed by collective organizations such as industry associations and NGOs. Organizations can represent the interests of business entities, such as retailers, processors or producers, or even non-governmental organizations. Such entities may adopt or not the norms. The third type of variation is represented by collective international standards, where the scenario is the same in the second mode, the difference is that these standards will be adopted and implemented internationally.

According to International Trade Center (ITC) and the Food and Agriculture Organization (FAO), the proliferation of private standards in recent decades can be justified, especially in view of factors such as: globalization of production chains; concentration of industries; transition to an increasingly private governance due to the lack of expertise and financial resources on the part of the Government to deal with increasingly complex issues; increased awareness among consumers about the quality and safety of food and of the environmental impacts arising from the consumption; and regulatory changes in the major developed markets (ITC, 2011; FAO, 2007).

In this context, large retailers use patterns of agro-food production as a form of exercising power that have within the institutional design, once such patterns provide indicators of quality and safety for consumers. The determination of this quality and safety model seeks to show to buyers that the agro-food products contain as much intrinsic attributes as concerning their production that differentiate it from its substitutes. In this way, the use of a certified production model as default is a strategy that tries to enter the consumer environment in order to create competitive advantages for companies that do. However, for this to happen it is necessary that the model be legitimized not only by the productive system, but also by consumer perception (Hatanaka, Bain & Busch, 2005).

3. METHODOLOGY

The methodology used is based on a qualitative approach, that in its turn, provides a better detail of the evidentiary problem. Qualitative researches are recommended to improve the understanding of questions and phenomena of real world, as well as can be used for constructing new theories (Eisenhardt, 1989; Roesch, 1995; Yin, 2005).

Among the diverse types of qualitative research, the case study was chosen, that it is adequate for this need to understand the sustainable production standards in Brazilian beef agro-food chain, once it is proposed exactly to investigate contemporaneous phenomena within a context limited by the concerned phenomenon and reality (Yin, 2005).

The case study explored within the governance context the use of the sustainable standards use by different agents that compound the beef supply chain in the northern region of the State of Mato Grosso. Regarding the sample particular condition (that is intentional), the researched agents were selected by means of the snowball technique. In this technique, the first interviewed refer others, who, in their turn, refer others and so on. The criterion to choose agents was their working performance in the Legal Amazon, and, in the case of the slaughterhouse, its presence in the external market.

In depth interviews were conducted, totalizing approximately six interviewed, two from the slaughterhouse (purchase manager, quality supervisor), three cattle breeders - one of confinement model, and the President Association of Cattle Breeders in the Northern State of Mato Grosso. The following section covers the transcriptions of the interviews that were analysed by means of content analytical technique.

4. SUSTAINABLE STANDARDS PRACTICED IN BEEF SUPPLY CHAIN - the Case from the Northern Region of Mato Grosso

The structure of the Brazilian beef supply chain is divided into: support subsystem, composed by basic insumes suppliers and transportation agents; raw material production subsystem, related to the farm animal production in animals breeding, raising and fattening stages; industrialization subsystem, involving transformation industry, that is, slaughterhouses of diverse sizes, responsible for animals slaughter; trade subsystem, covering wholesale, exporting an retail, and consume subsystem, characterized by final consumer. Figure 1 depicts the structure of the Brazilian beef supply chain.

Though being a spot in international scenario, due to its competitive potential, and national recognise, as important earning generator, the Brazilian beef chain faces obstacles in relation to the adoption of sustainable practices. In this context, this study sought to verify according to some chain agents view, how the governance process in complying with the sustainable standards required by consumer market takes place. Following, based on the undertaken interviews, the agents view, according to what was previously described in the methodology section.

a) Slaughterhouse

The selected company is a medium size slaughterhouse that performs in the beef sector, certified for exporting fresh beef. It is a familiar company and its geographical distribution is in three units situated in Sinop/MT, Matupá/MT and Iguatemi/MS, that covers besides the slaughterhouse, the confinement activities, farms, distribution center, own carrier and retail.

The mechanisms used by the company to guarantee the quality standards are: Traceability, Good Manufacturing Practices (BPF), Operational Hygiene Standard Procedure (PPHO), Danger Analysis and Control Critical Points (APPCC); Industrial Maintenance (MI); Humanitarian Slaughter (AH); Internal Audit (AI); Integrated Pest Control (CIP); Specific Risk Material (MRE); Operational Sanitary Procedure and Qualification of raw materials, insumes and services suppliers. Supervising and following are taken by the Federal Inspection Service (SIF).

The transcription of the interviews conducted in the slaughterhouse showed that in order to comply with the exporting standards, the slaughterhouse needs to stick to all the rules which refer to sustainable standards. That process begins in the Purchasing Department of the slaughterhouse, time that before buying, the buyer needs to research and find out if the cattle breeder meets all environmental and social standards. Such researches are carried out by the organs of the Federal and State governments (Instituto Brasileiro do Meio Ambiente – IBAMA, Instituto de Defesa Agropecuária do Estado de Mato Grosso – INDEA-MT and the Ministério do Trabalho e Emprego - MTE), and, if found any abnormality in meeting the specified standards, the purchase is barred until the deficiencies are remedied. On the other hand, the slaughterhouse is also responsible to meet internal standards as regards external sustainable standards. Figure 2 brings a table showing the main points put by the respondent responsible for this sector in the slaughterhouse concerning to the environmental and social standards, focus of this study.

Besides the above-mentioned highlighted aspects, other big relevant point to serve the importing market is the concern on animal welfare. In that point, many countries have distinct claims, as Russia (cited by the respondent), that requires that the animal stay in an area with coverage before slaughter, something that doesn't make much sense, since the vast majority of slaughtered animals in Brazil are created in the field.

b) Confinement

The confinement activity is an extension of the activities of the slaughterhouse. Both belong to the same owner. In the interview with the responsible for the confinement, it was evident that the governance process with focus on sustainable standards is to have a strict control on the process of traceability of animals, once, the containment

also receives non traced animals. It must be highlighted that the European market only accepts animals traced from birth. By giving input on confinement, the whole process of traceability is conferred, and verified if all the requirements required by the importing country are met. The concern in this aspect is large, regarding the possibility of the slaughterhouse disqualification.

A point reported by the respondent and that caught my attention was that the confinement in 2013 received a visit from European agents for the purpose of verifying whether they were being met all standards levied by that market. The visit was accompanied by staff from INDEA-MT, Sistema Brasileiro de Identificação e Certificação de Bovinos e Bubalinos – SISBOV and Ministério da Agricultura, Pecuária e Abastecimento – MAPA. The goal was to see how the process of traceability in Brazil is done and also the very big concern of these agents was with animal welfare. The feedback of these agents was that the Government should have greater participation in the process of certification and traceability of the animal, this aspect was discharged by staff due to traceability in the region be made by a private company. However, the literature also brings several authors (see Henson and Humphrey, 2010; Shuster and Maertens, 2013) that highlight the participation of private standards to regularize the market in developing countries.

c) Cattle breeders

In order to deliver their production of cattle for slaughter, the cattle breeder must meet environmental, social and animal welfare standards. Environmental standards refer to measures to reduce the emission of greenhouse gases, comply with the laws of deforestation, preservation of riparian forest, prevent soil degradation and pollution of water resources. Social patterns are associated with the proof that the property has no slave and child labourers. Already with regard to animal welfare standards, the producer must prove that this animal does not suffer bad treatment, own traceability or provide a statement that meets the requirements of traceability (information regarding the age of the animal, vaccines and animal health). To demonstrate that the standards are being respected by the cattle breeders, the company buyer requires from cattle breeder preflighted documents issued by the regulatory body, as Secretaria de Estado de Meio Ambiente – SEMA, IBAMA and the MTE.

Under the cattle breeders view, the difficulty in meeting what is required, it's on the constant standards, documents changes and the bureaucracy to meet all requirements whether they are environmental, social and animal welfare. And so, in an attempt to trace the production, many producers choose not to track the high degree of complexity required to achieve and maintain the bovine traceability. The cattle breeder argues that the cost/benefit ratio is very low.

One of the cattle breeders interviewed mentioned the great interference on NGOs regarding the rules. Since it is situated in the Amazon Region, many NGOs argue the compliance with the existing environmental laws and, according to him, these same NGOs pressure the governmental bodies in the sense of imposing new requirements, mainly the environmental ones.

Other point highlighted by the cattle breeders was the power of the great retailers and the importing market exerted on the chain for establishing any standards. In both cases, the respondents highlighted that are aware of the environmental and social rules which need to fit for serving the market, and it was possible to notice the concern in meeting them, as essential requirement to sell their product.

d) Association of Breeders

The perception of the President of the Association of Cattle Breeders, concerning the use of sustainable standards, is similar to the cattle breeders' point of view. That the creators, are concerned to comply with the requirements, but complain of difficulty in getting and at the same time maintain traceability, due to the high cost and to meet all the procedures requested for purchase and maintenance, since these, they change constantly.

The president of the association exposed lobby matters practiced by part of the great companies in order to dominate beef production market with their own production standards, turned to social and environmental issue as well as animal welfare. He also mentioned the interference of NGOs in the construction of standards to serve to the external market.

5. FINAL CONSIDERATIONS

The article analysed the use of sustainable production standards in beef production chain, for this, the objective aimed to know in theory what these sustainable standards are, and following, some interviews with key agents in this process were interviewed in order to arise some points to understand how these control mechanisms work in chain. The information from the interviews showed a great concern from agents involved in the beef production chain in complying with the sustainable standards, but, it is noticed that there are difficulties of some chain links

in getting the compliance of all rules required by the importing market, other point verified by the interview was that still there is no formalization of the environmental and social certifications in the region as a competitive differential. Here, it is highlighted the cases reported by the individual producers and the president of the association, which show that the difficulties occur due to the cost of the qualification and traceability implantation and maintenance, the cultural differences and the perception on the importance of consumption values. In this point, it becomes necessary the more effective participation of public and private policies turned to this chain sector, aiming the increase of these producers participation in supplying products which comply with the standards required by the external market.

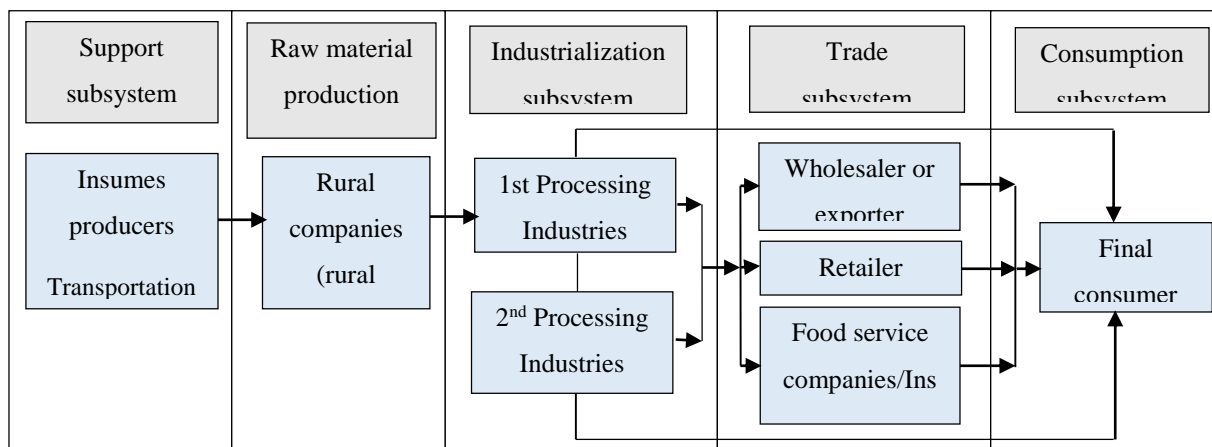
As limitation of the study, it is highlighted the reduction of chain agents researched. It is suggested that data collection should be extended to a larger number of informants that interact in this chain, especially environmental agents (IBAMA), animal welfare (INDEA-MT), research-oriented institutions such as Empresa Brasileira de Pesquisa Agropecuária (EMBRAPA) and Empresa de Pesquisa, Assistência e Extensão Rural (EMPAER). Furthermore, being a single case study, which approached only a unit of processing industry (slaughterhouse) of the Amazon Region, the data cannot be generalized. However, the study provides a variety of themes to be fleshed out, involving other agents (IBAMA, EMBRAPA, INDEA-MT) that influence the production chain to check which is the vision of how governance, specifically those towards sustainable standards in beef chain.

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Figure 1. Structure of the Brazilian beef chain



Source: Buaianin, A. M.; Batalha, M. O. (Coords.) (2007). *Cadeia produtiva da carne bovina* (Vol. 8). IICA, Brasília (Brasil).

Figure 2. Sustainable standards required by the slaughterhouse

Sustainability Standards	Rules to be covered:
Environmental	<ul style="list-style-type: none"> * Suppliers must comply with production environmental and social rules; * Care about the open burning of residues; * Burns in boilers must comply with the standards regarding the risk of leakage of toxic (ammonia); * Own affluent treatment fluids to avoid contamination of the soil and the water table; * Appropriate use of non-renewable resources, such as electricity and water consumption; * Wood for boiler comes from sustainable forest.
Social	<ul style="list-style-type: none"> * Working conditions must respect ethical standards; * Encourage employees continuously to education, as well as provide training courses; * Quality of life at work (physical activities, health care, social actions, among others).

Source: Research data (2014)