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Sustainability on soy and beef supply chains: case studies focused on the Brazilian Amazon

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Abstract

This study analyses sustainability practices on soy and beef supply chains through two case studies focused on the Brazilian Amazon. Both industries are expanding at unrestrained rate into this region. This work shows evidence that several civil society initiatives, although incipient, have positively influenced the sustainability agenda of focal companies.

Keywords: agribusiness, supply chain management, sustainability.

1. Introduction

The world economy is based in the production, distribution and consumption of goods. This logic is based on the use of natural resources and energy, on the use of workforce, consumption of goods and disposal of waste, using the environment as provider and material sink. The result of this process can be positive because it allows people to access essentials goods such as food, but it can be negative when you consider the exaggerated consumption of natural resources and waste production, leading to a global social and ecological imbalance. Aware of this reality, our society have shown to be more alert and concerned about social and environmental liabilities that are going to be left for future generations. This, together with pressure of national and international civil society organizations, more stringent laws and market restrictions, are pushing companies and their respective supply chains to seek more sustainable measures and practices in their businesses, producing goods ethically and respecting the capacity of absorption and regeneration of the planet.

This study analyses sustainability practices on soy and beef supply chains through two case studies focused on the Brazilian Amazon. Both industries are expanding at unrestrained rate into this region. We will initially discuss the concept of sustainability in the context of supply chain sustainable agriculture, and the research methodology.

2. Sustainability in the context of the supply chain

A series of social and environmental factors begin to surface and acquire importance in the business world after the consecration of the sustainable development concept, "[…] that which attends to the needs of the present, without compromising the possibility of future generations attending to their own needs" (WCED, 1991:46), launched by the United Nations in 1987, in the report "Our Common Future". Hart

(2004) points out four key-motivators in order for global sustainability to be incorporated into the corporate world: industrialization and its environmental impacts; organized civil society demanding more transparency and monitoring companies' behaviors; technology revolution and innovation; and population rise, as well as increased poverty and social inequality. Paired with this ascending sustainability movement, comes the consolidation in the corporate sphere of the Triple Bottom Line (TBL) approach, which emphasizes that companies should not only be concerned with the economic value they create, but that they should also take into consideration the positive and negative environmental and social impacts in their value creation (ELKINGTON, 2004).

In order to be incorporated fully in the corporate context, social and environmental concerns need to be incorporated in the organization's strategy, as well as in the entire supply chain. SVENSSON (2007) defines supply chain management (SCM) as a philosophy that aims to integrate different agents and activities around one product or service. The number of agents and partners involved in the development and distribution of a product has increased due to globalization, albeit leaving the question of who is responsible for a product's impacts unanswered (SEURING; MÜLLER, 2008a, LEE; KIM, 2009, PEDERSON, 2009). The debate on SCM, which was previously more centered on efficiency, quality and product safety (CORSTEN et al., 2005; KLEINDORFER et al., 2005; SRIVASTAVA, 2007; PEDERSON, 2009), also began to incorporate social and environmental aspects (LEE; KIM, 2009).

Seuring and Müller (2008b, p. 1.700) define sustainable supply chain management (SSCM) as "[…] the management of material, information and capital flows as well as cooperation among companies along the supply chain while taking goals from all three dimensions of sustainable development, i.e., economic, environmental and social, into account which are derived from customer and stakeholder requirements.". With the initial awareness that supply chains impact the world and that the scarcity of natural resources impose economic growth limitations, the SSCM concept, and previously, green supply chain management (GSCM), emerged demanding that, in addition to targets like agility, adaptability and connectivity between the acting parties, value is created without exceeding environmental limits, as well as taking into account the needs of internal and external stakeholders (KLEINDORFER et al., 2005; LINTON et al., 2007; SVENSSON, 2007; SRIVASTAVA, 2007; MOORE; MANRING, 2009).

The integration of sustainability in the corporate sphere and in supply chains can arise as a consequence of internal or external drivers. These internal drivers can appear due to moral conviction or ethical issues (ELTANATAWAY et al., 2009; PEDERSON, 2009), as well as because of the need for cost efficiency (KLEINDORFER et al., 2005), among other factors, depending on the company's profile.

There are also a series of external drivers that motivate companies to incorporate social-environmental concerns, including: pressure from (i) non-governmental organizations (NGOs) and organized civil society, (ii) consumers and (iii) the government through regulations (SEURING; MÜLLER, 2008a, 2008b; CILIBERTI et al., 2009).

The pressure from NGOs and organized civil society has as one of its emblematic cases the action against the shoe company Nike, accused of using child labor in its supply chain. This case, which had global repercussion, showed the fragility behind the reputation of such a giant corporation, due to its lack of social responsibility in the SCM. The company lost market share and had its brand name tainted amongst its stakeholders (MARKLEY; DAVIS, 2007; SEURING MÜLLER,, 2008a; ELTANATAWAY et al., 2009). The reputational risk led many companies to adopt control of the social and environmental aspects which affect their supply chain but had been previously ignored by managers. Moreover, the consumers' pressure for the incorporation of social and environmental aspects in SCM is perceived, for example, in companies from commodities sectors, that by nature already operate with small margins and cannot afford to lose access to markets due to sustainability issues (MARKLEY; DAVIS, 2007), and therefore begin to demand social and environmental requisites and certifications from their suppliers. Lastly, the third external driver is also of extreme importance: companies need to anticipate the increasingly strict regulations associated to social and environmental issues, otherwise they will be obliged to change when such laws have already been established. Porter and Linde (1995) draw attention to the fact that good environmental regulation is not only necessary to society, but can be a source of competitive advantage to productive sectors.

Such sustainability drivers begin to make the company change its way of acting, seeking to diminish social-environmental risks within its operation or to develop more sustainable products and services. These two reactions are not mutually exclusive: multiple times a company will begin to integrate sustainability in its SCM in order to

decrease its risk and realizes that it can improve by changing its product as a whole. Although various companies consider that internalizing social-environmental matters necessarily means reducing the organization's economic performance, the perception that actual concerns towards sustainability issues is not an obstacle in its revenue but helps a company become more competitive, is gaining more and more prominence (KLEINDORFER et al., 2005; SRIVASTAVA, 2007; SEURING; MÜLLER 2008a, 2008b; ELTANATAWAY et al., 2009).

However, to reach this competitive state, there are a series of steps to incorporate sustainability in the internal processes of organizations, including the raise in costs and greater demand for coordination on the respective monitoring, evaluation and auditing processes, among others. To make this change successfully, it is crucial that there is internal collaboration and communication, as well as transversal work within the supply chain as a whole (CORSTEN et al., 2005; SEURING and MÜLLER, 2008a, 2008b, PEDERSON, 2009). The integration of social and environmental issues in the standard processes of a company are key issues to guarantee the real risk reduction and improvement in the supply chain performance. Albeit usually viewed as obstacles, after being implemented with constant monitoring and training, not only increase the trust of other stakeholders amongst the supply chain, but also improve internal processes, decrease risk, and increase competitiveness in the supply chain (SEURING and MÜLLER; 2008a; CILIBERTI et al., 2009);

In a notable way, the agribusiness sector and more specifically the agricultural activity has the great challenge of increasing production and, at the same time, conciliate the preservation of soil quality and the environment. It is important to understand how sustainability is incorporated in this sector.

3. Sustainability in the agro-industrial sector

Although agricultural modernization and the entitled Green Revolution have generated a raise in productivity and food supply as never seen before, it was also responsible for a series of negative economic, social and environmental impacts. This evolution and growth process of agriculture made in 2007, that agribusiness on the world represented US$ 10.7 trillion, approximately 22% of world GDP (STEFANEL, 2008). The monoculture system caused intense soil degradation, making producers increasingly dependent on fertilizers to maintain their land productivity. Furthermore,

modern mechanized agriculture created dependency for fossil fuels, raising farming costs and decreasing financial returns. Regarding environmental issues, deforestation is very common in areas of agricultural expansion, where the producer takes down the forest in order to make space for new productions. Deforestation generates a series of negative environmental impacts, from the loss of biodiversity to consequent soil erosion, loss of nutrients and desertification, as well as the contamination risk from the use of fertilizers (NEPSTAD, 2004; EHLERS, 2009). Modern agriculture has diminished small producer's chances of survival, which did not have the minimum scale necessary to deal with the costs of mechanized monocultures. Many had to sell their lands and migrate to cities, increasing urban poverty and social inequality (BORCH, 2007; EHLERS, 2009).

In the midst of such scenario, modern agriculture began to be questioned and different approaches started to emerge. Among them, the alternative agriculture approach, which demanded the reduction of agrochemicals' use in favor of organic agriculture, the creation of a regional system with a local market and agriculture, which seeks to incorporate the TBL in the productive environment. However, it is worth emphasizing that although many argue that alternative agriculture is the only way to achieve sustainability, such a model has yet to prove itself adequate to feed a world in exponential growth (NEPSTAD, 2004; BORCH, 2007).

At the same time in which these movements begin to emerge, the global public power also portrayed their concern. The United States Government, for example, began to take into consideration social and environmental criteria in the deliberations regarding agriculture in the 1985 agricultural law, which incorporates the concern for decreasing the adverse environmental impacts of agriculture (EHLERS, 2009).

Such movements contribute to the creation and acceptance of the "sustainable agriculture" term, which began to be defined at the end of the 1980's by organizations such as the Food and Agriculture Organization of the United Nations (FAO) and the World Bank. For these organizations, sustainable agriculture is a food supply system that would use nature's services and resources in the best possible manner, maximizing the land's productivity and return to the producer, without damaging the environment and exhausting its natural resources. Furthermore, such a system should minimize the use of non-renewable resources in inputs such as fertilizers and pesticides that damage the environment and human health, guaranteeing only the necessary supply for human

consumption (FAO, 2002).

The greatest challenge of agriculture, according to the Agenda 21, is to increase supply in lands that are already being utilized in order guarantee access to food of an already growing population, conserving the remainder and regenerating lands that are no longer productive. In order to do so, ample work is needed that involves new policies and land reform, wide participation of the population, better diversification of the producers' income, better land conservation and better resource management (WCED, 1996).

To this effect, sustainable agriculture is a transition, an evolution of the current traditional agricultural model, a vision of the future, taking into consideration the planet's limitations and the well-being of the population that lives in it (EHLERS, 2009). In this transition, innovation will have a vital role. However, it is also necessary to consider communication and dialogue between stakeholders, education, new ways of thinking and producing, which should be approached in a fresh, conjoined vision (BORCH, 2007). In order to find the path of sustainability in agriculture, it is necessary to consider the diversification of agricultural systems, the reorientation of scientific research, the strengthening of family agriculture, as well as recognizing the pressure from consumers for healthier food products. These are important steps for a conjoined creation of a new sustainable production vision for the future.

4. Methodology

This paper is to be included in the field of case studies and its design is based on Yin (1994) and Eisenhardt (1989). They assert that this strategy is well used by researchers who try to respond to questions such as "how" and "why", relative to phenomena referring to contemporary facts, which occur in contexts of little possibility of control over the studied events. The present research aims to analyze sustainability practices on soy and beef supply chains focused on the Brazilian Amazon. Great attention is given to the evaluation of how external pressures related to social and environmental issues have incurred over these chains based in the Amazon region.

In order to achieve such an objective, the study was based on secondary and primary data. Data collection takes place by raising secondary data about the soy and beef supply chains in the Amazon, their characteristics, main agents, productive process, social and environmental impacts that gave rise to the external pressures which

affect these chains. Primary data was raised so as to evaluate the different perceptions surrounding the external pressures on these chains as well as changes in the social-environmental practices resulting from these pressures. The primary data was obtained by semi-structured interviews[i] with different stakeholders such as soy trading companies association, clients from the agribusiness sector, financial institutions, NGOs and government representatives. Throughout the case's presentation, the unquoted data refer to information collected during these interviews with the aforementioned stakeholders. Within the case's analysis (item 5), there are, additionally, considerations from the authors of this research paper.

5. Sustainability on soy and beef supply chains on the Brazilian Amazon

Brazil is the largest exporter of bovine meat products and the second largest exporter of soy and corn (LANDIM, 2010).

Brazilian agriculture exerts a key role in the economy, responsible for about 35% of the country's Gross Domestic Product (NEPSTAD, 2006). The country is the second largest soy producer globally (USDA, 2008) and about 70% is exported to locations such as Europe, China, Japan, among others (HSA, 2006). The soy supply chain in Brazil, as seen in the rest of the world, is leaded by large trading companies such as Cargill, Archier Daniels Midland (ADM) and Dreyfus, which basically dictate the rules for producers and are responsible for 60% of national commercialization. Soy was initially introduced in Brazil in the southern region of the country. During the 70's, the soy supply chain began to expand to the country's Midwest region, surpassing the barrier of the Amazonian biome at the end of the last century. Some of the Brazilian government's development policies launched during the 70's created incentives for producers to migrate to the Midwest of Brazil: plantations were subsidized, access to credit was guaranteed, among other subsidies.

Notwithstanding, the Brazilian government financed Embrapa, the Brazilian Company of Agricultural Livestock Breeding Research, which researched ways for soy to have better productivity according to the climatic conditions of the tropical savanna region and Amazonian region. Large multilateral banks such as the World Bank and its private arm, the International Finance Corporation (IFC), also financed this expansion by investing in infrastructure projects in the region. More recently, globalization was a

huge soy demand driver, mainly derived from China. Moreover, there was land available in this Amazon region, and climate in the region was favorable due to frequent rainfall. Finally, in late 1990's, a BSE outbreak occurred, an illness popularly known as mad-cow disease. This gave Brazil an important competitive advantage, as the entire world began purchasing animal feed free of animal protein and soy based (FEARNSIDE, 2001; BICKEL; DROS, 2003; FRANÇA, 2003; FURTADO, 2004; HSA, 2006; NEPSTAD, 2006).

The Brazilian cattle breeding is the largest commercial herd in the world, with about 199 million head of cattle for meat and milk (IBGE, 2008). The beef cattle in Brazil represents the largest share of agribusiness in the country, generates about 7.5 million jobs and a turnover of approximately US$ 29 billion per year,.According to the Association of Brazilian Beef Exporters, the beef production has increased almost 44% between 1999 and 2008. The exports represent only 22% of the amount cattle produced (2 million of 9 million per ton of carcass equivalent) while the domestic market represents 78%, but the country is the largest exporter in volume and revenue, being responsible for 28% of the global beef exports (ABIEC, 2010).

Until the 80's, the cattle breeding in the Amazon region were seen as a way to secure landholding, obtain gains from speculative capital and receive government benefits and credits. The activity was not profitable if there were no tax incentives to run it (MARGULIS, 2003). Tax incentives granted since the 70's helped to install the infrastructure and industry that were associated with beef production in the Amazon region. Currently, there are many credit lines for cattle ranching and slaughterhouses in the Amazon region, offered in large part by banks like the Brazilian Development Bank (BNDES), the Inter-American Development Bank (IDB), the IFC, besides Brazilian private banks, such as Bradesco. They contribute to the expansion of industrial facilities in the region, a process leaded by large groups such as JBS Friboi, Bertin, Marfrig, Independência and Minerva: the focal companies (slaughterhouses/tanneries) of the beef supply chain which operates in the Amazon region. In 2008, BNDES allocated 40% of total disbursements for direct transactions with these groups. (SMERALDI, 2009).

Between 1997 and 2007, the livestock grew 77% in the Amazon region compared to 24% of the rest of the country, which can be explained by several reasons like: the easy appropriation of public land for speculation, the good climatic conditions,

the illegality associated with environmental and labor issues, the fertile land with greater carrying capacity in terms of animal unit per hectare. Althought large slaughterhouses groups have operations in this region, currently only 40% of the Amazon slaughterhouses are legalized (SMERALDI, 2009).

Four among ten Brazilian municipalities with the highest number of cattle, are within the Amazon region. Three of these - Sao Felix do Xingu (State of Pará), Juará and Alta Floresta (State of Mato Grosso) – figure in the list of leading cities in deforestation in the Amazon according to the Deforestation Detection in Real Time (DETER) system from the National Institute for Space Research (INPE) (IBGE, 2008). The livestock industry is responsible for approximately 60% of illegal deforestation in the Brazilian Amazon (GAIER, 2009). In addition, among organizations and individuals that make up the "Dirty List[ii]" of the Brazilian Labor and Employment Ministry, 62% were related to cattle ranching in the Amazon region (SMERALDI, 2008).

The most visible environmental impact from soy and beef supply chain was accelerated deforestation. In the very beginning of the first decade of the century, the Ministry of Environment registered a 40% deforestation rate in the country. In many cases, deforested areas were initially used for grazing and rice production, and later converted into soy plantations (FRANÇA, 2003).

The deforestation brings a series of negative consequences to the environment, from the clear loss in biodiversity associated to chopping down the forest, as well as CO2 emissions, changes in the rain patterns, among others (DROS, 2004; FEARNSIDE, 2006; NEPSTAD, 2006). Due to deforestation, Brazil is one of the greatest CO2 emitters in the planet today (SALOMON, 2009). Moreover, the excessive use of deforested soil for large mechanized plantations with no crop rotation schemes, resulted in degradation, making the application of agro-toxics on these vast plantations necessary, which in its turn results in soil contamination, as well as rivers (DROS, 2004).

Social impacts also began to spread: great mechanized plantations crushed family agriculture and, in consequence, various families of small producers migrated to cities looking for new occupations. To this effect, an increase in poverty occurred, as well as a disordered urban expansion, raising urban violence, lack of structure to attend to the basic needs of the population such as health, food supplies, and basic hygiene, among others. Still, although Brazil is the second largest global soy producer, it does not

contribute to improve the food supply deficiency that the country still suffers. In addition, the race for land occupation created agrarian conflicts and caused a series of disagreements with local riverside communities and indigenous tribes. Community health was compromised due to the increase in contamination by exposure to agro-toxics and in addition, there was an explosion of forced labor, analogous to slavery (FEARNSIDE, 2001; BICKEL; DROS, 2003; LOBO, 2006; NEPSTAD, 2006).

5.1. Social and environmental pressures over the soy and beef supply chain in the Brazilian Amazon

At the end of the 1990's, researchers began to publish studies alerting about the impacts soy expansion in the Amazonian biome. At the same time, international and Brazilian environmental NGO's began to mobilize and campaign against the unrestrained expansion of soy in Brazil. Greenpeace, for instance, articulated campaigns against the production of transgenic soy in Brazil and against the construction of the Cargill port in Santarém, state of Pará, a project that represented great incentive towards opening new areas in the midst of a vast area of native forests in the Northern region of the country (BICKEL; 2003; DROS, 2004).

At the same time, the European consumer began to pay attention to the impacts the soy they had been purchasing from Brazil could cause. Holland was one of the first European markets that began to discuss how to improve sustainability practices in the Brazilian soy supply chain: the environmentalist movement induced consumers to motivate themselves in that part of the world, as it occurred in a posterior moment with Switzerland as well. Swiss supermarket COOP, responding to pressures from environmentalist consumers, created social and environmental criteria for soy production (PROFOREST, 2004). In addition to these criteria, known as the Basil Criteria for Responsible Soy Production, COOP, alongside CORDAID from Holland, international NGO WWF, Unilever, and the Brazilian Amaggi Group, created a forum in which principles and criteria for sustainable soy production globally would be discussed – the Round Table for Sustainable Soy (RTRS). At the same time, Brazilian companies from the retail sectors, such as Carrefour Brazil and Pão de Açúcar, began to demand better criteria for soy production as well (NEPSTAD, 2006).

In 2006, a Greenpeace campaign launched by the report Eating Up the Amazon exposed the impacts of soy expansion in the Amazonian region through the

irresponsible actions of large trading companies as well as incentives from the government and financing agents. It also highlighted the consumers' responsibility over the social and environmental impacts generated by the soy production expansion. Greenpeace's report exposed companies like McDonalds for causing, although indirectly, deforestation in the Amazon region: soy was being sourced from this region in order to feed poultry that later on become nuggets for various parts of the world. The report mapped all players in the chain and claimed that they should work together in order to internalize the social and environmental impacts of the supply chain and commercialization of soy. Furthermore, Greenpeace formulated a list of minimum criteria for a sustainable soy production, which included banning soy sourcing from areas inside the Amazon biome (GREENPEACE, 2006b).

This report had repercussions throughout the chain. Thinking of its reputation, McDonalds demanded their suppliers, such as Unilever, not to source soy from deforested areas. In its turn, Unilever, concerned about the risks associated to their business, demanded from the trading companies - their suppliers - the same actions. Consequently, the large trading companies directed this demand to small producers.

Other pressures arose in parallel: financial institutions began to demand their clients to consider the social and environmental impacts in their production process, subject to canceling current contracts; this condition made it so that trading companies began to become aware of the practices within their chain (FGVAGRO, 2008). Alongside these conditions, pressure was also exerted on government, historically a major driver of the soy expansion.

In June 2009, Greenpeace released another report: "Slaughtering the Amazon". Result of three years of work and research, the NGO linked the presence of cattle industry (mainly farms, slaughterhouses and tanneries) with Brazilian Amazon deforestation, increase of CO_2 emissions, use of forced labor in the region and invasion of indigenous lands. The report noted that one out of eight hectares of native forest destroyed in the world was responsibility of the Brazilian Amazon cattle industry.

Additionally, the study pointed out that 75 large multinational companies - such as Timberland, Ikea, Adidas, Gucci, Prada, Burger King, Unilever, Johnson & Johnson, Wal-Mart, Tesco, Carrefour, Makro, Kraft, Hereford - were buying raw material and/or products from slaughterhouses/tanneries – like Marfrig, JBS Friboi, Bertin,

Independência and Minerva – whose suppliers include cattle farms associated to forced labor and illegal deforestation within the Amazon biome (GREENPEACE, 2009).

The report alerted that besides the economic incentive for the cattle industry, one of the factors that contributed to the beef expansion in the Amazon region is the lack of governance, through corruption, limited and lack of coordination capacity between government departments. In addition, the lack of control of land titles, agrarian violence, land grabbing and Congress intention of reformulating the Brazilian Forest Code are reasons that contribute to strengthen the concerns on Amazon region environmental protection. Regarding social aspects, reinforced the connection of large slaughterhouses with farms into the "Dirty List" of the Brazilian Labor and Employment Ministry (MTE). The traceability of the raw material showed that, the most part of the meat and leather produced in the Amazon are shipped to the Brazilian South and Southeast to be processed and exported. This process hides the illegality trace, permitting the "product laundering" through the chain until it reaches the final consumer (GREENPEACE, 2009).

Other reports and studies from local NGOs had already shown the relationship between the Brazilian cattle sector and the Amazon deforestation expansion and climate change. However, the release of the report "Slaughtering the Amazon" impacted media in Brazil and abroad, especially because worldwide brands were involved with deforestation of the main and largest remaining rainforests in the world. One day after the report was released, the Federal Public Prosecutor's Office (MPF) of the State of Pará and the Brazilian Institute for Environment and Natural Renewable Resources (Ibama) filed a public civil action against 21 farms accusing them of the illegal deforestation and against 11 slaughterhouses for sharing crime responsibility, asking for US$ 1,15 billions damage. Also, they recommended to 69 companies that used to buy livestock products from this region to stop trade relations with the accused parties (PECUÁRIA, 2009).

5.2. Reactions of the Brazilian soy supply chain to external pressure

Initially, the trading companies defended themselves from the accusations made against them (CARGILL, 2006). However, McDonalds began to demand action from their suppliers, which in turn, induced trading companies to open dialogue with civil society. It was the first time that soy producers and civil society, two players that

historically had been enemies, came to an agreement on how to improve social-environmental practices in the chain. The answer to these pressures occurred through dialogue and negotiation with multiple stakeholders. From this dialogue, a series of voluntary initiatives surfaced, such as the Soy Moratorium, the continuation of the RTRS dialogue, among others.

The Soy Moratorium was signed initially by the Brazilian Association of the Vegetable Oils Industry (Abiove), the National Agency of Grain Exports (Anec), and the civil society. The treaty demanded that producers purchased soy only from areas that were not deforesting the Amazonian biome, or in other words, that were committed to zero deforestation within the biome. Moreover, it envisioned continuous monitoring of the production areas in order to assure zero deforestation. Lastly, it also aimed to raise producer awareness on the social-environmental impacts of soy production (ABIOVE, 2006; KAUFMAN, 2007). In order to make these objectives fulfilled, working groups were created.

The small producers' reaction was not a positive one. The State of Mato Grosso Farmers Association (Famato) published a release rejecting the moratorium, as they believed that they were being forced by the large trading companies to follow the new rules, without being previously consulted (FAMATO, 2006). However, not seeing any alternative option, the small producers adapted to the demands made by the trading companies.

The government's reaction, despite positive, was a bit delayed. Even though it had already been following the national plan against deforestation since 2004, together with the creation of state parks and conservation units, the government adhered to the initiative only after the moratorium's first year. Civil society, nevertheless, committed to assist and engage as much in the discussion, as well as in the necessary monitoring and supervision.

During the Soy Moratorium's initial year, monitoring was carried out in big farms of at least 100 acres each, given it was more challenging to catch small areas of deforestation. On the Moratorium's second anniversary, monitoring was carried out in areas of at least 50 acres, decreasing the breach for undetected deforestation. This farm monitoring over 50 acres corresponds to 95% of soy production in the Amazonian biome. In its third year, it will reach 98,5% of monitored production. In order to reach 100%, it would be necessary to monitor farms of 25 thousand acres up (GTS, 2007;

GTS, 2009; GREENPEACE 2008).

Still, the RTRS continued its discussion that had been initiated in the end of 2003. In 2007, shortly after the Soy Moratorium, the initiative had almost 50 participants. The United States initially demonstrated interest, however, it soon gave up its participation. Since it is the largest soy producer in the world, the country's participation would have been essential, however, because it exports mainly to China, who did not demonstrate the same social-environmental concerns as Europe, it did not feel the need to enter the discussion.

The RTRS aimed to create a series of principles and criteria regarding responsible soy. Since the Round Table embodies more than just the Amazonian biome, considering matters of soy production that impact the entire world, the initiative did not get into the same level of detail as the moratorium. The principles were based on nine key impacts of soy production on the environment and society. The first version of these principles was ready in 2009 and is currently undergoing its pilot stage. The idea is to create, together with these principles and criteria, a certification system (RTRS, 2009).

Notwithstanding self-regulation initiatives, the government, aside from doing what had already been established in the federal forest code (authorized deforestation of 20% in the Amazonian biome) began to act with other regulation: the federal government launched a resolution at the National Monetary Council, resolution CMN 3992, which forces farmers to prove their properties' legal status in order to be able to obtain financing from financial institutions (GREENPEACE, 2008). Despite the fact that trading companies were not obliged to follow through with the resolution – just banks that were not the main financiers of soy production in the area – this initiative marks the beginning of a trend that could be on its way in terms of external pressure through regulations.

5.3. Reactions of the Brazilian beef supply chain to external pressure

Threatened by the risk of losing large beef markets, vital for the industry maintain its world leadership, some initiatives emerged in many links of the beef production chain. The major retail companies, among them Pão de Açucar, Carrefour and Wal-Mart, declared not to buy more cattle from illegal farms and slaughterhouses and, momentarily, suspended all contracts. They requested to slaughterhouses not to

buy cattle from illegal farms, ask to deliver the Animal Transit Guide (GTA) with the invoices and to submit an independent audit plan with international recognition to ensure the origin of the product. (SPITZCOVSKY, 2009).

On December 7th, 2009, the Brazilian Supermarkets Association (Abras) launched a program to certify its beef supply chain in Brazil, a self-regulation program on beef traceability and origin. The supermarkets involved guaranteed their customers that they only buy from slaughterhouses committed to ending deforestation in the Amazon and also respect the hygiene and food safety patterns and respect labor conditions. (FROUFE, 2009; OLIVEIRA, 2009). During July 2009, after four weeks of intense dialogue slaughterhouses, landowners, tanneries, the State Government of Para and Federal Public Prosecutor's Office (MPF) of the State of Pará signed Terms of Adjustment of Conduct (TAC). This legal instrument foresee some obligations in the short, medium and long term to slaughterhouses, to the Pará State Government and to those farmers that want to be out of illegality and are interested in maintaining business relations with slaughterhouses (MOTTA, 2009).

Among the various TAC's clauses, one of them was that after six months its signature it could only be purchased animals from properties with the Rural Environmental Registry (CAR) registered in the Environmental Secretariat of Pará State (SEMA).The registration is the first step to regulate the ownership in an environmental way. The slaughterhouses committed not to buy cattle from farms that were on Ibama's list of illegal areas and/or the "Dirty List" of Brazilian Labor and Employment Ministry (MTE), or were defendant by land indigenous invasion, by agrarian violence, by land grabbing and/or by deforestation and other land conflicts. According to the Environmental Secretariat of Pará State (SEMA), since August 2009 there was a 430% increase in requests for environmental legalization of rural properties. (MAGALHAES, 2010).

Another initiative with significance was the zero deforestation pact assumed voluntarily by large slaughterhouses. The agreement was no deforestation in the Amazon biome after its signature and companies should prove in a monitorable, reportable and verifiable way that no direct or indirect supplier has deforested in the Amazon biome. It was prohibited the invasion of indigenous lands and protected areas, use of forced work, land grabbing and agrarian violence. The companies have

committed to buy cattle and beef products from properties with a reliable, auditable and internationally traceability system. (GREENPEACE, 2010)

Among the many different goals and common commitments assumed, some of the largest slaughterhouses (JBS, Bertin, Marfrig, Minerva and Frigol) formed a single group to seek for ways to improve the sustainability practices in the beef supply chain. Each company reaffirmed its commitment to protecting the environment, with social responsibility practices and traceability of their products.

The IFC and Bertin slaughterhouse decided in common agreement on June 2009 to terminate a contract of US$ 46 million. This occurred after civil action from the Federal Public Prosecutor's Office (MPF) of the Sttae of Pará and the launch of the report Slaughtering the Amazon (2009) (IFC, 2009). In an official statement, Bertin announced that the end of the contract was due to the economic crisis that affected the Brazilian agribusiness, but IFC did not explain the reason and said it demands of its customers and itself the highest social and environmental standards. (IFC, 2009; INACIO; FREITAS, 2009).

BNDES announced in July 2009 the improvement of social and environmental requirements for funding and equity in the cattle production chain. The new measures complement the initiatives taken in the bank's shareholding agreements with slaughterhouses in 2008 and companies that have received resources from BNDES. After 2012, all slaughtered animals should have at least six months of traceability and in January 2016 with full traceability, i.e., from the birth to slaughter. (BNDES, 2009; GAIER, 2009).

Finally, but as important as the other initiatives in June 2009, after a long dialogue and process that started in late 2007, the Sustainable Livestock Working Group (GTPS) was launched. The GTPS is a forum composed of different institutions as banks, different industries, civil society organizations, cattle producers associations, retailers, research centers and universities. Aware of the influence of cattle ranching on Amazon deforestation, the GTPS approved as a main line in their work plan the zero deforestation in the sector activities. The plan foresee the monitoring of the Amazon deforestation, the definition of principles and criteria for the beef production and marketing, the creation of a traceability system and the dissemination of good production practices for the sector (AGROAMBIENTE, 2008).

5.3 Case study analysis

External pressures required changes over social and environmental practices in the soy and beef productive chain in the Amazonian biome. This resulted into a successful case making way to improve social and environmental practices in other supply chains based in Brazil.

The soy supply chain case was one of the first great examples of this type of external pressure in Brazil and showed that this process is possible. Soy is an example to be replicated within other chains in the future, as is being done in the Brazilian livestock chain. Furthermore, it is interesting to see how even an extremely anonymous product also required a minimum level of accountability. Still, it was an important success case with regard to communication and engagement.

The fact that the soy market is, in its great majority, focused on the external sector, and that Europe is Brazil's main commercial destination, which in turn has a more elevated level of social-environmental regulations, made it so that the Brazilian soy supply chain was more vulnerable to questionings on its social-environmental practices within the country. Also, the need for infrastructure and financing makes monitoring of the supply chain easier (FEARNSIDE, 2001; BICKEL; DROS, 2003; FRANÇA, 2003; HSA, 2006). At the same time, due to the growing concern with climate change, the opportunity to discuss sustainability in the soy supply chain in Brazil arises, due to the relation between crop production and deforestation in the Amazonian region. Additionally, external pressures over the wood and palm supply chains were also precursors to the external pressure that occurred within the soy supply chain.

It was the first time that different stakeholders were put together in a structured manner in order to discuss a private initiative in favor of sustainability; the first time that agro-business publicly assumed that they were part of the problem and committed to making improvements. This posture gave way to some of the results seen in the beef supply chain. Even the financing agents, through financial institutions, began to signal interest on the moratorium as an important monitoring tool. The government itself has been more active in programs to stop deforestation in the area, even though there is still much work to be done in that front.

An important role of the Soy Moratorium in its first years was to interrupt soy expansion and consequently the Amazonian biome deforestation. This movement also

motivated producers to evolve to more social and environmental practices. Nevertheless, it is difficult to state that the external pressure over the soy chain is a real success case or just a quick reaction to a recent pressure. Even so, today it is possible to say that a series of improvements have been achieved in the chain's social and environmental practices and, at least, it can be considered effectiveness case.

However, the fact that deforestation has been reduced in the Amazonian biome and that soy expansion within the area has been reverted during the moratorium's first years can be questioned, as producers deforest an area in order to plant another crop and only after a few years begin to produce soy (OLIVEIRA, 2008). Another relevant fact is that soy price in the recent years after the Moratorium was signed was low, and that could also explain deforestation decrease.

The Soy Moratorium itself has a voluntary and transitional character. It is a treaty made initially in 2006 and it has already suffered revisions since then (NERY, 2009). If the problems that the moratorium seeks to resolve have not been effectively considered, all that was accomplished up to now may be wasted. Furthermore, the moratorium focuses only on the Amazon biome and not on the tropical savanna eco-region; therefore, even if the moratorium is effective, the deforestation problem in Brazil as a whole is still not resolved. It is necessary to reinforce that the moratorium is in fact just the first step, considering the bare minimum that must be done and is still in its implementation stage. There are a series of principles and minimum criteria that Greenpeace raised in 2006 when it first released its report that still need to be covered.

In the livestock case, despite several accusations against deforestation and use of forced labor due to livestock activity in the Amazonian biome, it was only when Greenpeace's world known report "Slaughtering the Amazon" was published and the public civil action in the State of Pará occured that the fact called the attention of large Brazilian slaughterhouses and worldwide brands from fashion, retail and cosmetics sectors. Only after the release of this report, this issue was included in their agenda focusing the sustainability in these different industries. It is not possible to ensure that everything was accounted for, but since this day several initiatives and innumerous discussions took place. Adherence to traceability electronic systems, deforestation monitoring, exclusion of suppliers who do not take into account social and environmental aspects, land regulations, among others are now measures that go beyond

volunteer initiatives, resulting into imperative actions for those who aim competitiveness..

Some positive and breakthrough initiatives appeared with NGO pressure on Amazonian livestock, but the progress is not very clear until now and contributions made did not help to achieve a greener beef supply chain in the Amazon region.

Finally, it is important to emphasize that the Soy Moratorium and zero deforestation pact assumed by the slaughterhouses and soy trading companies diminish liabilities, but has not found a way to fix the heart of the problem. There is still a problem with the focal companies social and environmental practices. In reality, the trading companies did not change their supply chains production processe. In order to truly change the sustainability practices of the chain as a whole, much more than that would be necessary.

A series of obstacles still remain and hinder the implementation of good social and environmental practices across these chains. Since the pressure and its consequences are still very recent, it is not possible to certify conclusive results.

The government also needs to act in supervision, monitoring and regulation. In 2012, with the release of the Brazilian federal ecological zoning, everyone should be registered, federally licensed and would have government control. However, there is a difficulty in implementing the rural environmental registration. There is need for positive regulation, such as incentives for family agriculture and positive purchasing policies.

6. Conclusion

This research presented evidence that the external pressure of clients forced the internalization of both social and environmental aspects within the practices of focal companies in the soy and beef supply chain.

The analysis presented in this paper has also shown that the strategy adopted to internalize social and environmental aspects in the soy and beef supply chain within the Amazonian biome was through the establishment of voluntary deals, as well as principles and minimum criteria to adapt their production processes. The most notorious voluntary treaty pertaining to the soy chain is the Soy Moratorium, which has the merit of joining different stakeholders to work towards a common goal. It was an effective way to engage different stakeholders and generate awareness.

Most certainly, both supply chains are still a long way from being sustainable: voluntary initiatives are not sufficient to assure the operation's sustainability along the chains. The government, for instance, should contribute in registering and monitoring producers and companies. Still, financing agents also have an important role, by demanding social and environmental requisites from the supply chain members.

There is a need for more involvement and dialogue with the financing agents and focal companies (trading companies and slaughterhouses), as well as a need for these companies to internalize the negative externalities that they create. In order to do so, there must be internal controls, monitoring, integration, awareness, engagement and most importantly, transparent communication. To this effect, the chains will guarantee not only its license to operate, but its competitive advantage as well.

Furthermore, dialogue and engagement between stakeholders are necessary in order to create practices that are more sustainable within these two supply chain examined. At this time, companies are still not changing their strategy and making a more sustainable product; they are just making the same product with some social and environmental criteria and not rethinking the supply chain strategy in order to be able to be both competitive and sustainable. .

Initiatives that mobilize the supply chains within the Amazon region to act differently towards sustainability, public policies that encourage the appreciation of the forest, income generation programs and capacity building in forest management, credit lines for biodiversity products; and structured and integrated markets can represent one way for a new economy, the Green one.

7. References

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[i] Interviewed agents: Brigit Hoffer, Consumer Policies Coordinator, COOP Switzerland; Mario Menezes, Autonomous Agronomist and Environmentalist; Bernardo Machado Pires, ABIOVE Sustainability Coordinator; Raquel Carvalho, Campaigner for Amazon Campaign, Greenpeace; Tatiana de Carvalho, Campaigner for Amazon Campaign, Greenpeace; Daiene Bittencourt Mendes Santos, Environmental Analyst – Policies for Combating Deforestation Department – Executive Office – Ministry of Environment; Rodrigo Gonçalves Sabenca, Environmental Analyst – Department of Sustainable Rural Development – Extraction and Sustainable Rural Development Office – Ministry of Environment; Roberto Smeraldi, Founding Director, Friends of the Earth – Brazilian Amazon; Christopher Wells, Superintendent of Social-Environmental Risk, Santander Brazil.

[ii] The Brazilian Human Rights Secretary together with the Labor and Employment Ministry (MTE) created on 2004 a list of companies and people that were punished for using forced labour. It is an official and online system where anyone can consult it.