SUSTAINABLE BEEF PRODUCTION IN BRAZIL
DIFFERENT INTERESTS TO A COMMON CAUSE

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SUSTAINABLE BEEF PRODUCTION IN BRAZIL
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Abstract

With the increasing concerns of beef production being the first cause of Amazonian deforestation, the Brazilian beef industry has taken major steps in recent years towards a more sustainable production. In this very competitive market, producers, industrials and retailers are each acting at their own level for this common cause. The aim of this qualitative research is to find out how the interests of these stakeholders can be aligned. The literature review covers a brief history of sustainable beef in the country, main concepts associated and the role and perception of each of the stakeholders of the beef value chain. Selected case studies and interviews of the actors of a given supply chain highlighted that it is urgent to accord on common objectives and on a practical action plan to unify monitoring systems. If there is no price premium for sustainable beef products, production becomes more efficient and this translates into profitability gains after the initial investment is repaid. Moreover, this effort should include small players who need financial support and technical assistance to integrate new technologies in their business to be able to control their social and environmental impact.

KEYWORDS: Beef - Beef supply chain – Sustainable production- Deforestation – Brazil
Resumo

Com a crescente preocupação de que a produção de carne bovina é a primeira causa do desmatamento amazônico, a indústria brasileira produtora de carne bovina deu passos importantes nos últimos anos para uma produção mais sustentável. Neste mercado muito competitivo, os produtores, as indústrias e os varejistas estão agindo por essa causa comum. O objetivo desta pesquisa qualitativa é descobrir como os interesses dessas partes interessadas podem ser alinhados. A revisão da literatura abrange um breve histórico da produção de carne bovina de modo sustentável no país e também os principais conceitos associados e o papel e a percepção de cada uma das partes interessadas na cadeia de valor da carne bovina. Estudos de caso selecionados e as entrevistas dos atores de uma determinada cadeia de suprimentos destacaram que é urgente chegar a objetivos comuns e a um plano de ação prático para unificar os sistemas de monitoramento. Se houver preço diferenciado para a carne produzida de modo sustentável, a produção se torna mais eficiente e isso se traduz em ganhos e rentabilidade após o reembolso do investimento inicial. Além disso, este esforço deve incluir investimentos financeiros para apoiar e dar assistência técnica para integrar novas tecnologias a seus negócios para poder controlar seu impacto social e ambiental.

PALAVRAS-CHAVE: Carne - Corrente de abastecimento de carne - Produção sustentável - Desmatamento - Brasil
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1 Introduction

“Unfortunately marketing has taken over from science when it comes to food regulation and food safety” says Professor Mike Gibney, Director of the University College Dublin Institute of Food and Health. This quote illustrates how important certification has become for retailers in the food industry these last few years. And the beef industry is no exception. As Brazil is the second beef producer behind the United States and first exporter in the world (Duff, 2011), it made sense to study the industry in the country as a minor change in production methods would concern lots of consumers. With the beef consumption per capita expected to increase from 6kg in 2016 to 7kg in 2025 (Organization for Economic Co-operation and Development-Food and Agriculture Organization, 2016) and a projected population growth of 12.3%, it would be a challenge to respond to global demand without sacrificing natural resources. Moreover, beef production does not only concern meat but leather is also an important output and brands like Nike rely on the Brazilian production. However, in our research we will limit beef production to meat products to focus on the entire supply chain.

Sustainable production is a top concern in the agenda of the Brazilian beef industry. With the publication of the report Slaughtering the Amazon in 2009, the Non-Governmental Organization (NGO) Greenpeace highlighted cattle ranching as the first cause of deforestation of the rainforest and accused the slaughterhouses of being responsible. Retailers were also mentioned in later reports. As a result, the Grupo de Trabalho da Pecuária Sustentável (GTPS) was created as a roundtable involving all the stakeholders of the Brazilian beef supply chain, including banks. The definition of sustainability was one of the first subjects tackled by the roundtable. If sustainable production is sometimes reduced to zero deforestation, we will adopt a more traditional definition taking into account social, economic and environmental characteristics (Harris, 2003). One of the main measures regarding sustainable beef consists in tracking the cattle along the supply chain to make sure that the meat sold does not come from deforested areas. McDonalds Novo Campo Project is a typical project: make sure
no meat sold comes from Conservancy Units and Indian Areas while following the principles with a commitment to zero deforestation, no child labor and slavery. It is validated by third party verification (McDonalds, 2016).

The bans of Brazilian beef in Europe, the US and Hong Kong in March 2017 recalls how traceability is essential to ensure quality of the product (Viande Avariée, 2017). However, on this tracking issue, the stakeholders have trouble finding a common solution. By stakeholders, we mean NGO’s, producers, retailers, banks involved in project financing, governments and retailers. The retailer Carrefour developed its own program launched in August 2016 while the industrial JBS has another tracking system. Competition is a key component of the market. Indeed, if sustainability is recognized as a common cause for all the stakeholders, it is hard to align them on how to concretely cooperate. The variety of programs and projects on sustainable beef going on in Brazil is a proof of the lack of cooperation of the actors involved. A major challenge for sustainable beef in Brazil is that the national market is not sensitive enough to sustainability issues to pay a price premium for beef. Most important criteria for the consumer are price and quality (Bradao et al, 2015). On the other end of the value chain, producers don’t want to engage in costs linked to sustainability improvements if they know the market will not compensate for these costs. This is why it is crucial to design a common action to solve this chicken and egg problem.

Hence the study was guided by the question:

**How to align interests of the different stakeholders in sustainable beef production in Brazil?**

The objective is to understand the roles and perceptions of the different stakeholders of a given value chain in sustainable beef in Brazil. At this stage of the research, we will define sustainable beef as the meat production that respects the 3 P in its economic, social and environmental dimensions.

The methodology applied in this research is qualitative, involving collecting primary and secondary data. The first step consists in a literature review of
Journal articles, newspaper articles, websites, books and movies on sustainable beef in Brazil. The second step was based on case studies and semi-structured interviews administrated to main selected stakeholders with analysis and conclusion.

The study is relevant in practice because it will give some aspects stakeholders should work on in priority when designing a sustainable beef supply chain in partnership with each other. This topic is gathering a lot of foreign attention now and the way the value chain is modified will greatly impact Brazil beef exportations in the years to come.

2 Literature review

This section presents an overview of the sustainability issue in Brazil in general, followed by a more specific analysis of the sustainable beef industry and the role of its different stakeholders in the country.

2.1 Sustainability and Brazilian agriculture

2.1.1 History and evolution of concept of sustainability

The concept of sustainability emerged with the observed impact of economic growth on the environment. For instance, in the eighteen century, the link between economic development and consequences on the environment was recognized with the theory of economic thinker David Ricardo. He believed that economic growth would eventually peter out due to the scarcity of natural resources, meaning land and its food production capacity (Kula, 1992). Two centuries later, philosopher Hans Jonas highlighted “the critical vulnerability of nature to man’s technological intervention” (Jonas, 1979, p6). Given the damages caused by economic development, Nature becomes a human responsibility in a future-oriented ethics. Not limited to the traditional anthropocentric vision, man
should care not only for him but also for the entire biosphere and act considering possible consequences in the future (Jonas, 1979).

This idea of preserving resources for the future spread with the United Nation report *Our Common Future* (Brundtland, 1987). According to Brundtland (1987), development is sustainable when it ensures “that it meets the needs of the present without compromising the ability of future generations to meet their own needs.” If this definition is the absolute reference on the matter and the mentioned report of the United Nation commission on Environment and Development is still a bible thirty years later, this definition remains very broad. Indeed, how can a non-renewable resource be used in a sustainable way? According to this report, the key element to sustainable development is to recognize that economic and environmental goals are fundamentally linked (Brundtland, 1987). Sustainable development also addresses social issues as the commission recognizes the need of equitable opportunities for all population (Brundtland, 1987).

This preparatory work led to the United Nations Conference on Environment and Development in 1992. The leaders of the world gathered in Rio de Janeiro acknowledged the need of a more balanced economic development towards more equality and the preservation of environmental resources. The choice of Brazil to organize such a conference had a particular meaning given the immensity and wealth of the territory. As a result, the Agenda 21 was adopted with twenty-seven principles and an action plan. Principle 1 is important because it affirms the anthropocentric position, placing the human being at the center of sustainable development (Cordonier Seger & Khalfan, 2004). Even though it seems leaders agree on much, the Agenda is not legally binding and principles remained to be applied in more specific treaties at national, regional and local levels (Cordonier Seger & Khalfan, 2004). In this study, we will take as a reference for this concept the 3P of sustainability (Profit-People-Planet), including the economic dimension (i.e., preserve balance), social (i.e., fair share of resources) and environmental aspects (i.e., land preservation) (Harris, 2003).
Over the years, the cause has spread from NGO’s and institutions to corporations. And has generated a lot of criticism. In their book *Eco-Business, A Big-Brand takeover of Sustainability* (2013), Peter Dauvergne and Jane Lister show how sustainability has become a business for companies and how it has been impacting their supply chain. However, for the authors, this means “eco-business is fundamentally aiming for sustainability of big business, not sustainability of people and the planet”. This explains all the controversies that have been going on private standard certificates that are often used more as a marketing tool than revealing a real new approach to the business. However, these voluntary standards are recognized on the market if a third party has approved them. In order to better understand the importance of the recent multiplication of private standards, the study *State of Sustainability Initiatives (SSI)* was conducted in 2014 by the International Institute for Environment and Development (IIED), the International Institute for Sustainable Development (IISD), the Finance Alliance for Sustainable Trade, Environment and Trade in a World of Interdependence (ENTWINED), and the Sustainable Trade Initiative (IDH) with the aim of “offering a framework for understanding the characteristics, important issues and market trends for select sustainability initiatives and standards operating in global market.” According to the report, the annual growth rate of standard compliant production across all commodity sectors reached 41% in 2012 while the conventional commodity sector grew of only 2%. Across developing countries, sustainable production is concentrated in Latin America.

### 2.1.2 Importance of agriculture in Brazil

Brazil plays a key role in the agricultural production of the subcontinent. Areas dedicated to agriculture occupy 35% of the territory with pasture leading the proportion of this occupation with 25% of land, which represents 200 million ha (Guedes Pinto, 2010). The country is among the main exporters and importers of many commodities such as sugar, ethanol, orange juice, coffee or meat. Brazil is also recognized as a leader for innovation and technology concerning tropical
agriculture with the Brazilian Agricultural Research Corporation (Empresa Brasileira de Pesquisa Agropecuária-Embrapa) sharing discoveries at a global scale (Guedes Pinto, 2010). The expansion of the agricultural sector in recent years in the country relies on productivity improvements (fertilizers, genetic improvements) but also on the increase of cultivated areas. Indeed, from 2003 to 2006, 90% of the cattle growth happened in the Amazon and often in replacement of natural forests (Smeraldi & May, 2008, see appendix 1). The Cerrado and Amazon regions are the most impacted. Deforestation would be responsible of 55% of national green gas emissions and the country ranks among the top 5 polluters, counting for 5% of global emissions. It is a key concern because even if the country is expected to reduce its share to 4% in 2030, deforestation will still be responsible for 43% of gas emissions if the average level of deforestation is similar to the average of the past ten years (McKinsey, 2009). Moreover, Brazil has the largest inventory of tropical forests (460 Mha). Main consequences of deforestation include soil degradation, climate change, loss of biodiversity and decrease of water resources (Guedes Pinto, 2010). To protect its large inventory of tropical forests (460 Mha), the government adopted in December 2008 the National Climate Change Plan. It aims at gradually reducing deforestation until it stops completely in 2040 (McKinsey, 2009).

More generally, agriculture and forestry accounted for 25% of national emissions in 2009 and this number is expected to rise to 30% by 2030 (See appendix 2). Half of these agriculture emissions come from cattle via enteric fermentation and organic wastes that produce methane (McKinsey, 2009). Adding to these environmental concerns, the expansion of agricultural activities in the region involves social issues such as the transfer of local communities, child labor and slavery. It is estimated that 25,000 to 100,000 modern slaves are today involved in agricultural work. In cattle ranching, they are mostly used to clear the land while displacing local communities (Campbell, 2008).

These problems regarding Brazilian agriculture can be explained by no comprehensive land use planning, monitoring system limited to some regions (Amazon) and poor law enforcement in some isolated regions at the farm level.
(Guedes Pinto, 2010). However, even if these problems exist, the heterogeneity of situations should not be forgotten: some Brazilian farms such as the farm Sao Marcelo are best practice and are inspiring examples at a global scale (first farm to get the Rainforest alliance for beef production in the world).

2.2 Sustainable beef production in Brazil

2.2.1 A world leader in beef production

Regarding the meat sector, Brazil is the second producer and the first exporter. According to the Association of Brazilian Industry Beef Exporters (Associação Brasileira das Indústrias Exportadoras de Carne - ABIEC), the sector represents 15% of Brazilian exports and employs more than 7 million persons (Viande Avariée, 2017). According to the Brazilian Minister of Commerce, Brazilian beef exports represented 4.3 billion dollars in 2016 with 150 countries involved (Viande Avariée, 2017). Beef exports represent 25% of global trade (McKinsey, 2009). The formation of ABIEC in 1979 was aimed at promoting national production at an international scale. The number of feedlots remains small compared to other exporting countries. Cattle are in feedlots only in the last period of their life, which means the production is still considered as “grass fed” (OECD, 2008). The long growth period (more than 4 years) can represent a challenge for farmers and some work on genetic improvements as a way to decrease this period (Sao Marcelo farm). To support the expansion and the modernization of the sector, the Brazilian Development Bank (BNDES) and the International Finance Corporation (World Bank Financial institution) invested in slaughterhouses (Junior & all, 2008). Indeed, the investments of the BNDES continuously increased in the industry since 2005 and beef production became the first sector of investment for the bank. The market became very competitive as slaughterhouses were fighting for BNDES preferences (Junior & all, 2008).

2.2.2 Historical perspective of sustainable beef in Brazil

The current agricultural production paradigm relies on high concentrated
chemicals and mechanized methods, which is supposed to guarantee high yields (Kluwe Aguiar, 2011). On the contrary, sustainable farming has been associated with the “protection and improvement of natural environment, animal welfare and the conditions of local communities while being productive and efficient” (Gianezini et al, 2014). Sustainable livestock production requires respecting environmental legislation (legal reserve) and responds to social pressure regarding deforestation, greenhouse gas emissions and water usage (Gianezini et al, 2014). However, these definitions remain quite vague and can lead to different realities. In Brazil, the most developed experience of this sustainable approach is organic farming. Beef is organic when animals are exclusively in pastures and are treated only with herbal and homeopathic products. In the country, organic beef products are certified and differ from sustainable beef (also referred to as “green cow” or “natural beef”) (Gianezini et al, 2014). According to Peinado Gomez research, in the specific context of Brazil, sustainability meant Amazon deforestation. This approach became institutionalized and Amazon deforestation became valuable for the industry, leading to various initiatives (Peinado Gomez, 2014). Hence sustainable beef and green beef refer to the same general idea while organic beef product is a more advanced experience with natural medication and raise in pastures that translates into a price premium.

Concerning sustainability in Brazilian beef production, Peinado Gomez (2014) sees three distinct periods.

From 2000 to 2009, the first denounces towards beef production were made concerning gas emissions and deforestation but the industry did not take any measures to fight against such consequences. The most significant alert at the time came from the World Bank Working Paper Causes of deforestation of the Brazilian Amazon (Margulis, 2004). According to Margulis, “the financial viability of cattle ranching does not mean that public policies should support it. For such support, a social and environmental analysis of the costs and benefits of cattle ranching and deforestation should be carried out”. In a 2006 report, the FAO denounced the impacts of livestock on the environment. With deforestation, cattle are also responsible for intensive water use and pollution and a major
driver of loss of biodiversity with pesticides used and cattle natural emissions of ammonia that causes acid rains (Steinfeld & all, 2006). According to the report, cattle’s ranching contribution to global warming accounts for 18%, which is more than the transportation sector. As mentioned in the McKinsey report, this gas production is due to enteric fermentation (digestion process) that rejects methane in the atmosphere. After the publication of Greenpeace report on soy crops in the Amazon, the GTPS was informally created as a way to protect the industry interests. Nevertheless, it took almost three years of discussion to come to “zero deforestation commitment” given the level of competition in the industry (Peinado Gomez, 2014). Indeed, an external shock was mandatory to align interests of the different stakeholders.

From 2009, the famous Greenpeace report Slaughtering the Amazon against slaughterhouses, alongside with Federal Prosecutor’s Office (Ministério Público Federal-MPF) action, forced the assimilation of deforestation into the beef industry. Both investigations started in 2007 and adopted a supply chain approach (Peinado Gomez, 2014).

Para’s Federal Prosecutors Office did a two years investigation to examine cattle ranching participation in deforestation. It ended in twenty lawsuits against members of the beef value chain in 2009. They first established a list of ranchers with environment liabilities using the information of the Animal Transport Handbook (Guia de Transporte Animal-GTA), which is mandatory when the cattle are transported. The GTA is an official federal document that records the moves of the cattle within states or between states to prevent sicknesses and infections. Then the Para’s Federal Prosecutors office traced slaughterhouses and retailers involved with these ranchers (MPF, 2009). Slaughterhouses such as Bertin or JBS were asked financial indemnities for social and environmental impacts on the Brazilian society. Moreover, retailers such as Carrefour or Wal-Mart were notified they were selling beef from illegal deforested areas and they had to suspend for forty days their purchases from the slaughterhouses involved to avoid being accused of co-responsibility of Brazilian deforestation (Peinado Gomez, 2014).
In the very same month of June 2009, Greenpeace published its report on the cattle beef industry. In their brand damage strategy, Greenpeace tracked deforestation from ranchers to consumers for meat and derived products such as leather and highlighted the key role of slaughterhouses in deforestation (Greenpeace, 2009). As “Bertin” and “Deforestation” are respectively the second and third most frequent words used in the report, it contributes to focusing the attack towards this particular slaughterhouse around a focal issue, Amazonian deforestation (Peinado Gomez, 2014, see appendix 3). In the report, it is stated “where Greenpeace was able to obtain mapped boundaries for ranches, satellite analysis reveals that significant supplies of cattle come from ranches active in recent and illegal deforestation. Trade data also reveal trade with ranches using modern-day slavery”. Hence even if they insist on the environmental impact of cattle and the link with deforestation, they also mention social consequences regarding working conditions of the industry. According to the report, cattle in the Amazon are responsible for 14% of the world annual deforestation, being the first driver of deforestation worldwide. Hence, by presenting a Brazilian problem in a global scale and involving multinationals such as Nike or Timberland, they attracted the attention of consumers from all around the world (Peinado Gomez, 2014). They highlighted how criminal meat was “laundered” throughout the international supply chains and some projects were directly financed thanks to institutional financial support of the National Bank for Economic and Social Development (Banco Nacional de Desenvolvimento Econômico e Social-BNDES) or the International Finance Corporation (IFC). As a result, the IFC retrieved its $US 90 million loan to Bertin and this led to the merger with JBS (Peinado Gomez, 2014).

This context led to the multiplication commitments towards sustainability. The Terms for the Adjustment of Conduct (Termo de Ajustamento de Conduta-TAC) was created by MPF for companies to recognize legally their socio environmental damages and commits to changes via an action plan (MPF, 2009). In addition, the Rural Environmental Registry (Cadastro Ambiental Rural-CAR) is a “pivotal key to assist the process of environmental regularization of rural properties and possessions instrument”. (Kanashiro Makiya, 2015). Indeed, the TAC forces
retailers and slaughterhouses to buy only from farms with the CAR, that is to say geo referenced information of protected areas such as Legal Reserve or Permanent Protection Area. Another consequence of these attacks was the signing of the Minimum Criteria for Industrial Scale Cattle Operations in The Brazilian Amazon Biome, also known as Zero deforestation commitment, Beef Embargo or Beef Moratorium (Peinado Gomez, 2014). It was signed in October 2009 by the four biggest slaughterhouses (Bertin, JBS, Marfrig and Minerva) and asked for a higher commitment than the TAC in terms of deforestation. According to Greenpeace, “measures include the monitoring of their supply chains and clear targets for the registration of farms that both directly and indirectly supply cattle as well as measures to end the purchase of cattle from indigenous and protected areas and from farms using slave labor” (Greenpeace, 2009). However, both documents saw geo referencing as a way to monitor deforestation. This also led to the formal creation of the GTPS (GTPS, 2012).

Hence it is at this time that deforestation became a “hegemonic” topic for the stakeholders and solutions such as geo referencing, litigation and brand damage were developed (Peinado Gomez, 2014).

Since 2012 and after these evolutions, sustainability is now seen as way to prevent future risks. “Risk can be broadly defined as the probability of variation surrounding an anticipated outcome” (Carter & Roger, 2008). The industry has now learned “how to use sustainability to promote their businesses” (Peinado Gomez, 2014). Greenpeace published an additional report three years after the first one to assess progress made: JBS Scorecard: How the biggest meat company on the planet is still slaughtering the Amazon. Following this accusation, JBS sued Greenpeace and won as the report had to be taken off the national Greenpeace website. But JBS understood how sustainability was becoming strategic and the position of sustainability director was created (Peinado Gomez, 2014).

2.3 Challenges and roles of the actors of the sustainable beef supply chain
2.3.1 Sustainable supply chain management

According to Christopher (2016), supply chain can be defined as “a network of connected and interdependent organizations mutually and co-operatively working together to control, manage and improve the flow of materials and information from suppliers to end users.” Hence supply chain management refers to the management of relationships to reach a more profitable outcome for all the parties of the chain and this can result in a competitive advantage, that is to say a position of enduring superiority over competitors (Christopher, 2016). Hence for Lambert logistics is only an organizational function while supply chain management is the management of a network of companies (Lambert & Enz, 2016). This can translate into a value advantage or/and a cost advantage while the goal is to deliver additional customer value at a lower cost. To him, the concept of value chain invented by Michael Porter becomes very similar to the one of supply chain. Porter understood competitive advantage came from the value chain, that is to say from each of the relevant activities of a company that created value if they were done better and at a lower cost than competitors. If some of these activities were not differentiated, outsourcing could become a strategic option.

With the increase of outsourcing activities, value is not created only by a single business but by “all the entities that connect to each other” (Christopher, 2016). According to him, we are entering an era of “supply chain competition”, that is to say companies do not compete only with marketing and advertising but with their all range of capabilities and competencies. However, competition is not limited to “supply chain versus supply chain” as the overlapping of supply chains is the rule and no exception (Lambert & Enz, 2016). A supply chain is managed link by link and the firm that will manage best its relationships will perform better than the organizations with the same suppliers and customers. Hence it is key to implement customer relationship management and supplier relationship management (Lambert & Enz, 2016). Management should target customers and establish a partnership with a small group of key customers based on shared values. Some of the expected impacts of customer management relationship are improvement of demand planning, optimization of physical networks/facilities.
or leverage of alternative distribution channels (Lambert & Enz, 2016, Figure 4 p10). The process is the same for selecting suppliers and the expected outcome is a win-win relationship benefiting all stakeholders (Lambert & Enz, 2016). The power is slowly shifting from suppliers to customers and the consequences of this are that these powerful customers ask more in terms of "service requirements" from suppliers (Christopher, 2016). And more sustainable practices are one of these services requirements.

Indeed, Carter and Roger (2008) developed a framework of sustainable supply chain management. As the triple bottom line (natural environment, society and economic performance) suggests that sustainable practices are not only beneficial to society or the environment but could have long term positive economic consequences, sustainable supply chain management is highly strategic. It is especially the case for risk management as seen in the part on the history of sustainable beef in Brazil.

Figure 1: Sustainable supply chain management (Carter & Roger, 2008)
Sustainable practices lie in the middle, at the intersection of social and environmental activities with the economic bottom line, which is qualified as “best” by the authors. To them, environmental and social practices have a major economic potential as shown by the size of the area in which sustainability is written. Cost savings due to reducing packaging wastes, reduced health and safety costs resulting from better working conditions, enhanced reputation among customers and shareholders are examples of potential economic benefits. This leads to the statement that firms reaching for sustainable supply chain management will have higher profits than the one only focusing on one or two elements of the triple bottom line. These sustainable practices are likely to result in win-win relationships for all the actors of the value chain (Carter & Roger, 2008). They can also lead to a reduction of transaction costs. Some obstacles to be overcome in the beef chain 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 subsidized competition (Redivo, 2015). In sustainable food chains, three main variations of standards can be distinguished. First is individual standard, which is developed by individual organizations who apply the norms throughout their chains. The second kind is collective national standard that are developed by collective associations and NGOs. The last type is international collective standard on the same principle except they are recognized at a global scale (Redivo, 2015).

### 2.3.2 The challenge of reducing transaction costs via exchange of market information

Transaction Cost Economics (TCE) is a theory that states exchanges between different agents involve costs of various degrees (Marques Viera, 2006). TCE tries to help us understand how groups make (and should make) decisions in a way that generates economically profitable outcomes (Ketokivi, 2016). Marques Viera recalls that the American economist Williamson identified three types of transaction costs. The first type of costs happens before the transaction and is linked to searching about products, prices, inputs, new partners, buyers and
sellers. The second type of costs is related to negotiation costs including agreements on trade terms (price, delivery for instance) and the costs of writing contracts and paying a commission to an intermediary. The last kind of transaction costs is linked to monitoring, that is to say inducing compliance and integrating feedback from the supplier or the buyer after the transaction (Marques Viera, 2006). This third type of cost is very important concerning sustainable beef.

Regarding communication, there are two kinds of information available along the supply chain, market information and technical information. “The first one deals with customers, competitors, suppliers, distribution channels, among others, by which the profitability of the investment is directly or indirectly influenced. The second kind, technical information, deals with product and process standards, regulation, certification, which do not consist of plans and actions by other people”. Technical information is supposed to be easier to access, especially in competitive markets (Marques Viera, 2006). The case study reveals that the beef processor selected has a lot of technical information available but fewer marketing information. Indeed, the beef processor would like to have more information about the end consumer in export markets (Marques Viera, 2006). Hence, having access to more market information could reduce transactions costs along the beef value chain.

2.3.3 The importance of stakeholder management in corporate social responsibility

Freeman described stakeholders as “any group or individual who is affected by or can affect the achievement of an organization’s objectives” (2001). According to him, stakeholder approach emphasizes active management of business environment and the promotion of common interests. Stanford Research Institute was the first organization to introduce the word stakeholder while arguing that managers needed to understand the concerns of shareholders, employees, customers, suppliers, lenders and society, in order to develop
objectives that the shareholders would support (Freeman, 2001). This means management should actively explore its relationships with all stakeholders to reach long-term goals and develop a sustainable strategy.

The idea of corporate social responsibility (CSR) broadens the scope of stakeholder analysis and underlines the importance of relationships in previously antagonistic groups (Freeman, 2001). Indeed, according to Tim Mohin, corporations are among the least trusted of our institutions (Mohin, 2012). But like any group of human, they can promote responsible behaviors or encourage cutting corners (Mohin, 2012). This is especially the case concerning green behavior. Environmental issues have taken more and more importance in the last few years for these corporations. And being green is not only a matter of good behavior as it also generates profits. “The gold that smart companies mine for being green includes higher revenues, lower operational costs, and even lower lending rates from banks that see reduced risk in companies with carefully constructed environmental systems” (Mohin, 2012). Hence developing sustainable strategies appears as profitable for corporations. “For business, it means that many stakeholders, in particular customers and employees are hearing the green message everywhere and are getting more concerned” (Esty & Winston, 2006, p11). After analyzing the experience of dozens of companies, Esty and Winston come to the conclusion that the environmental advantage is becoming key in terms of competitive differentiation whereas other elements such as labor costs are flattening. According to them, “mismanaging these issues can drain value out of a company quickly- and damage brand reputation built up over decades of careful cultivation” (Esty & Winston, 2006, p3).

However, CSR is a concept that is not limited to environmental issues but refers to a cluster of concepts around business ethics (May & all, 2007). It signifies alternative ways of doing business contrasting with the neoliberal view according to which the only responsibility of business is to make profit in respect to the law (May et all, 2007). Each of the term of CSR has been challenged individually. However, the term social is often seen as implicitly inclusive and “relating to all aspects of society” (May & all, 2007, p8). The expressions sustainable development and sustainability are often used to refer to the same
idea as they imply paying attention to social, economic and environmental aspects of society. CSR has evolved with the new forms of communication and the use of Internet. Getting access to information is not anymore the monopoly of a few people. However, “corporations have also learned to use the media, oftentimes confounding news report with public relation exercises, embracing and reframing CSR as good business” (May & all, 2007, p37). It is a way for the firm to reach all stakeholders.

Indeed, the central concern of a stakeholder approach is “the survival of the firm” by understanding their impact and having the support of those who can affect the firm. The approach should be very specific. Concrete stakeholders to the firm should be identified with names and faces and understood in the context they are evolving in (Freeman, 2001). Moreover, “successful strategies integrate the perspective of all stakeholders rather than offsetting one against each other”. Hence, according to Freeman, stakeholder’s interests must be managed all at the same time. They should not only be understood at a given time $T$ but also managed over the long run.

Harrison and St John identified two basic approaches for managing stakeholders: buffering and bridging (Freeman, 2001). Buffering is the traditional approach for most external stakeholder group and refers to activities such as market research, public relations and planning. In the contrary, bridging involves forming strategic partnerships. This approach involves adopting common goals and lowering the barriers around the organization. The sustainable beef value chain seems to be adopting more a bridging strategy being proactive to develop common practices (Freeman, 2001). However, the main challenge remains the identification of stakeholders. Does illegitimate stakeholder exist? Even if it is the case, taking stakeholders interest into account will increase the social performance of the firm. If the direct impact of social performance on economic performance is not obvious, it remains one criterion on which civil society evaluates a firm’s impact. Hence, the stakeholder theory shows the key importance of aligning interests of the different stakeholders of the beef value chain to guarantee the success of the firm.
2.3.4 Role and position of the actors of the sustainable beef value chain

The beef supply chain is now a global phenomenon (Kluwe Aguiar, 2011). One farmer cannot anymore operate in isolation but pass the local slaughterhouse and reach market dynamics influencing food production at a larger scale (Kluwe Aguiar, 2011). In the sustainable beef value chain, we identify the direct value chain composed of producers, slaughterhouses, retailers and civil society. Government, research institutions and technology companies also play a key role in implementing sustainability in beef production.

➢ Producers: According to the Foreign Agricultural Service of the United States Department of Agriculture, there are more than 226 millions cattle heads in Brazil (Cook, 2017). Around 30% of farms in Brazil are involved in cattle ranching. Continuous grazing in large pasture extensions with low input is the main production system (Cerri et all, 2016). In tropical areas like the Cerrado, the majority of pastures are unfertilized with grasses of African origin, mainly Brachiaria spp (Cardoso et all, 2016). This type of land has a potential to accumulate soil carbon and more productive pastures will accumulate more soil carbon than degraded pastures (Cardoso et all, 2016). Animal weight gain can be accelerated with applications of nitrogen and phosphorus fertilizers. The production of these fertilizers requires significant fossil fuel inputs and increases the overall greenhouse gas emissions (Cardoso et all, 2016). However, in his research, Cardoso proved evolving from extensively degraded pastures to Nitrogen- fertilized improved pastures or to grass-legume mixed swards could reduce the carbon footprint between one third to a half (Cardoso et all, 2016). Ranches vary in size, ranging from small subsistence ranchers who employ traditional techniques to large mechanized farms. As cited by Alves Pinto, the Brazilian institute of Geography and Statistics (Instituto Brasileiro de Geografia e Estatística) concluded in 2006 that small producers were the more numerous even if they owned only 18,6% of the land. He also mentions that these small producers have little or no access
to machinery, infrastructure or information. Cattle birth, growth and fattening can occur in the same place or in different farms (Alves-Pinto, 2013). Indeed, cattle often spend time on different properties prior to slaughter, can be raised in non-compliant organizations without a CAR registration and can be sold to a compliant ranch before being transferred to a slaughterhouse. (Gibbs, 2015). This is known as the laundering process (See appendix 5). Tracking individual animals is the solution to ensure full traceability but it will take years to put in place.

- **Industrials:** The three largest slaughterhouses Marfrig, Minerva and JBS process a large proportion of the cattle (Kanashiro Makiya, 2015). As mentioned previously, they all signed zero deforestation agreement in 2009. According to Gibbs, “Slaughterhouses are a key leverage point in the supply chain due to their physical location in the agricultural-forest frontier, daily interactions with ranchers, and ability to restrict market access immediately” (Gibbs, 2015, p42). In her study, she wanted to quantify meatpacker and rancher response to zero deforestation agreements in the Para state. According to her results, in 2009 36% of supplying properties of JBS had recent deforestation and this fell to 4% in 2013.

- **Transport:** Forms of transportation vary according to local conditions and the state of the animal. Transport by inland waterway or by road is the most frequent (Andrade et all, 2009). It is very important to prevent the animals from being hurt and getting bruises in the process to preserve animal welfare and the quality of the meat. To be even more sustainable, beef products should be transported in efficient ways. Indeed, optimizing cold chain transportation is a way to reduce carbon footprint across operations (JBS, 2017). According to a research of Neto and Filho, increasing refrigerant spaces at departure and destination is a way to minimize transport costs (Neto & Filho, 2009). Preventing empty truck miles also increases sustainability of products and global efficiency (JBS,
Retailers: The largest beef retailers in Brazil are Carrefour, Wal-Mart and Pão de Açúcar (Alves Pinto et al, 2013). The result is all of these actors are committed with climate governance (Kanashiro Makiya, 2015). The conclusion of her paper on sustainability initiatives driving supply chain: climate governance on beef production system is that “producers will have to adapt to the new rules of production under the scope of sustainability as defined by large retailers.” This underlines the important role of retailers in the value chain given their proximity with the consumers. Retailers value their efforts in developing sustainable beef and communicate with the consumer via certain labels such as Alianza do Pastizal for Carrefour. Based on internal documents, this meat is produced in the south of Brazil and protects the Pampa biome as 50% of the land is conserved instead of the 20% required by the law.

Research and technology: Genetic improvement is becoming an increasing phenomenon in the Brazilian cattle industry. The crossing between the taurine and zebu species is already a current practice in the industry in order to produce meat of better quality (Duran, 2014). These improvements also concern trainings. As an example, the company Rehagro trains professionals to raise productivity in the cattle industry, via the insemination of semen for instance (Rehagro, 2017). A part from genetics, tracking technologies have developed a lot over the last few years. Agrotools “delivers intelligence to agribusiness actors through geospatial technology solutions”. The company covers more than 1 million farms in the world and 90% of the legal Amazon territory according to their website. They used a platform called TerraMatrix, a collaborative tool which allows them to cross data provided by ranchers and public data to make sure no cattle comes from a protected area. It counts Carrefour, Walmart, ABIEC, GTPS, JBS, the World Wide Fund for Nature (WWF) and McDonald’s among its clients or partners (Agrotools, 2017). To also help detail production chain, Merck Animal Health
launched last year an app called Meat Sustainability Calculator. A standard of North American production practices was established and beef producers can compare to this average to see where they stand in terms of sustainability. (Beef Magazine, 2016). The calculator helps evaluating greenhouse gas emissions as well as water and land usage. All this shows that more and more tools are available to integrate sustainability into the beef production. However, as cited in the Brundtland report (1987), “while this technology offers the potential for slowing the dangerously rapid consumption of finite resources, it also entails high risks, including new forms of pollution and the introduction to the planet of new variations of life forms that could change evolutionary pathways”. Indeed, genetic beef improvement to make it more sustainable could be considered as a new variation of life form.

- **State sector:** Governments agencies encourage the development of sustainable practices in the beef industry via policies or support of projects (Alves Pinto & all, 2013). Since 1934, Brazil had legislation in place to protect forests but it hasn't stopped deforestation. However, Brazil’s new Forest Code (Law N. 12.651), in force since 2012 appears as an efficient tool to keep up with the recent reduction of deforestation in the Amazon. When implemented, this law will allow better monitoring of land use (WWF, 2016). The effective participation of supply chain actors and decision makers is necessary for the law to be successfully implemented. The key instruments of the law are the Rural Environment Registry (Cadastro Ambiental Rural-CAR) and the Environmental Compliance Program (Programa de Regulação Ambiental- PRA) (WWF, 2016). The CAR is not yet complete partly because landowners in some regions still have concerns with CAR registration (WWF, 2016). This shows the difficulties of implementing policies at a local scale.

**Figure 2:** Government agencies involved in sustainable beef industry (source Alves Pinto et all, adapted by the researcher)
From the previous chart, we see there are many government agencies involved in sustainable beef development at a national level and fewer at the federal and municipal levels. This can be a reason for difficulties of accompanying producers at a local level.

- **Brazilian civil society:** Civil society, mainly consumers and NGO’s also support sustainability via projects or via research highlighting specific problems to cattle productions (Alves Pinto & all, 2013). Some NGO’s involved in the Brazilian cattle industry are Friends of the Earth- Brazilian Amazonia (Amigos da Terra-Amazônia Brasileira), Alliance of the land (Aliança da Terra), The institute of environmental research of Amazonia (Instituto de Pesquisa Ambiental da Amazônia), the National Wildlife Federation (NWF), The Nature Conservancy (TNC), and WWF. Moreover, the Forest and Agriculture Certification and Management Institute-Imaflora (Instituto de Manejo e Certificação Florestal e Agrícola) is the NGO responsible in Brazil for the Sustainable Agriculture Network (SAN) 2010 certification program (Alves Pinto & all, 2013). In a study that determines the factors with influence in the Brazilian beef consumption,
environmental issues stand out in consumer desires. This goes along with a demand for more quality attributes such as less chemical residues, concern for animal welfare and no harm for the environment (Brandao et all, 2015). Health, socio-cultural and economic factors are the other three categories of factors that matter to global consumers.

- **Export markets:** Commodity exportations are an important link between the Brazil and the international economy (Peinado Gomez, 2014). And the beef market is expected to grow in the coming years. For instance, China is becoming a major consumer of animal protein hence all products (poultry, beef) are expected to increase in terms of volume and value (Kluwe Aguiar, 2011). China is currently the second importer of Brazilian beef in the world so it represents a major commercial opportunity for Brazil (Viande Avariée, 2017). In globalized economies, being sustainable could be a factor of differentiation and allow Brazilian beef producers to remain competitive. The Brazilian beef market also has to adapt to standards required by importing markets. Hence, foreign rules can also act as a catalyst for change in production (Redivo et all, 2015). However, it is mandatory to polish the image and reputation of Brazilian meat in at a global scale. Indeed, according to recent studies, consumers of the European Union do not recognize Brazil as a country of origin (Kluwe Aguiar, 2011). The recent scandals linked to rotten meat in March 2017 did not improve this image (Viande Avariée, 2017).

- **Banks:** Even if banks are not directly involved in the beef value chain, they are important stakeholders and can play a key role in sustainable beef development in Brazil by having a very strict loan policy. Besides own initiatives of banks, the financial sector has a framework to guide its investments in terms of social and environmental impact (Guedes Pinto, 2010). In Brazil, there is the Protocolo Verde while at the international level the Equator Principles (EPs) stand as a reference. According to the official website, EPs is a risk management framework adopted by financial institutions for determining, assessing and managing
environmental and social risks in projects. It also provides a minimum standard for due diligence to support responsible risk decision-making. Hence in Brazil, “it is expected that loans and other banks operations would guarantee that their investments only go to responsible business” (Guedes Pinto, 2010). The results of his survey on tools and products to finance agricultural activities and manage social and environmental risks show there are different policies and profiles of banks. Some are more conservative while some have adopted exclusion criteria and qualifications. They recommend that the financial sector consider funding directly the farmers through cooperatives and producers’ associations. They also underline the necessity of developing traceability systems. For them, the joint sustainable and social certification should be encouraged between companies and suppliers. Because it finances operations in diverse parts of the chain, the financial sector has an important role to play in sustainable beef and should be drivers of responsible business (Guedes Pinto, 2010).

Focus on the role of the GTPS: As former GTPS president Eduardo Brito Bastos presents it: “GTPS is formed by different segments of the beef cattle value chain in Brazil, which represents the industries and organizations of suppliers of inputs and machinery, production and farmer’s organization, distribution networks (wholesale and retail), credit and insurance services, civil society organizations, research centers and universities”. The goal of the organization is to develop socially just, environmentally responsible and economically viable livestock production (GTPS, 2012). They do so by developing tools and mechanisms involving monitoring, tracking, production criteria, purchase and financing and economic incentives to develop sustainable beef (GTPS, 2012). They have partnership with the government as well as interactions with international beef associations. The structure of the organization gathers an assembly, an executive committee, mediation committee and working groups (Technical Commission, Economic and Financial
Incentives Commission and Dissemination Commission). The composition of board of directors of the executive committee illustrates the diversity of stakeholders involved in the industry. Difficulties to align stakeholders are mentioned several times in the report. According to Francisco Sergio Jardim, “the discussions of the Forest Code show the difficulties in reaching unanimity in the sector”. Not even the specialists have reached a consensus on what is sustainability when it comes to the global beef value chain (WWF, 2014). The report details the results of all the programs they are involved such as the Rio Verde Project which aims at recovering and preserving 100% of the gallery forests along the main rivers of Mato Grosso until 2020. We can note the diversity of the actions of the GTPS and the projects they are supporting at the national, federal and local scales (GTPS, 2012).

Now that we have seen the role and contribution of the different actors to sustainable beef development from a theoretical point of view, let’s focus on the figure below, extracted from a study of Gianezini & all dating from 2014. This will help understand what the perceptions of each stakeholder are in practice.

**Figure 3 : Sustainability and agents of the beef chain in Brazil** (Gianezini & all, 2014)

<table>
<thead>
<tr>
<th>Chain links</th>
<th>Agents</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Consumption</strong></td>
<td>Consumer NGO’s</td>
<td><strong>Perceptions/demands</strong></td>
</tr>
</tbody>
</table>
|  |  | - Concerned about consuming products from productive chains that adopt environmentally and socially correct practices  
|  |  | - I wish to “eat well, safe, and with a clean conscience”  
|  |  | - Animal welfare and food security  
|  |  | - Many consumers are taking part in groups about sustainable livestock |

| Research | Research & technology institutions | **Understandings/Results** |
|  |  | - Development of environmental accounting methodologies that better portray Brazilian reality: ecological footprint (ha per capita) and carbon footprint (greenhouse gas emissions: kg CO2-e/kg product)  
|  |  | - Vegetation cover and fragmentation  
|  |  | - Comparative studies of the economics of mitigation alternatives  
<p>|  |  | - Research of more productive fodder varieties and the |</p>
<table>
<thead>
<tr>
<th>Distribution</th>
<th>Retailers</th>
<th>Orientations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>- Invest in researching the carbon cycle in Brazilian soils and productive systems</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Suspend the purchase of meat from deforestation areas in the Amazon</td>
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<tr>
<td></td>
<td></td>
<td>- Cattle Origin Guarantee Program</td>
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<tr>
<td></td>
<td></td>
<td>- Comply with the “Cattle Breeding Pact”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Signature of specific term commitment</td>
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<tr>
<td></td>
<td></td>
<td>- Creation of sustainable labels (certificates)</td>
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<tr>
<td></td>
<td></td>
<td>- Meat brands, with differentiation and added value</td>
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</tbody>
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<thead>
<tr>
<th>Processing</th>
<th>Beef industry Slaughter-Houses</th>
<th>Orientations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Program for the cattle purchase procedure:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Investments in sustainability and incentives to sustainable livestock breeders</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Do not raise cattle or purchase meat from conservation areas (or Brazilian native reserves)</td>
<td></td>
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<tr>
<td></td>
<td>- Observe the labor regulation from ministry of work and data from IBAMA</td>
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<tr>
<td></td>
<td>- Reuse tannery waste as soil fertilizer</td>
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<tr>
<td></td>
<td>- In addition to competing with other countries for market, there is also a competition among national and international chains</td>
<td></td>
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<thead>
<tr>
<th>Production</th>
<th>Breeders</th>
<th>Orientations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Mitigation of greenhouse gases through: natural recovery/reform of degraded pastures, genetic improvements, feedlot and farming/breeding integration</td>
<td></td>
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<tr>
<td></td>
<td>- Increase in pasture capacity; increase in pasture biodiversity; improve soil fertility and permeability conditions; reduction of the residue levels; natural control of plagues and conservation of water resources</td>
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<tr>
<td></td>
<td>- Explore the Brazilian Development Bank (BNDES) funding lines in pasture recovery</td>
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<tr>
<td></td>
<td>- Demystify livestock breeding as a villain in the environmental degradation process</td>
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<tr>
<td></td>
<td>- Education: diffusion of such concepts in schools</td>
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<tr>
<td></td>
<td>- Sustainable Brahman Project and “Boi Guardião” Program</td>
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<tr>
<td></td>
<td>- Carbon credit (often called a carbon offset) commercialization</td>
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</tbody>
</table>

| Suppliers | - Genetics for sustainable livestock breeding |
|           | - Specific inputs for organic livestock breeding |

<table>
<thead>
<tr>
<th>Regulation</th>
<th>Government</th>
<th>Actions/Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Allocate resources for environmental adequacy projects regarding livestock activities</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- New Forest Code (Undergoing the approval process)</td>
<td></td>
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<tr>
<td></td>
<td>- Brazilian System of Beef and Buffalo Meat Identification (SISBOV): Brazilian identification and certification system of cattle and buffalo origins</td>
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<tr>
<td></td>
<td>- «Brazilian Beef »: highlight the natural pasture breeding system,</td>
<td></td>
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</table>
efficacy of herds’ sanitary control programs and excellence of
slaughterhouses
-Brazil’s competitive advantage in sustainability: large availability of
land, water and sunlight, cheap workforce, good supply of inputs,
access to production technologies, privileged position in climatic
diversity, adaptation of the zebu breed to the tropics and breeder
vocation

Hence this figure underlines all agents in the Brazilian beef value chain are
taking significant measures concerning sustainability at every level. This is
something to keep in mind when defining the methodology.

3 Methodology

This paper is based on an exploratory research with a qualitative approach
including already published case studies and semi-structured interviews.
According to Malhotra (2010), the goal of exploratory research is to give an idea
on how and why things are happening by exploring insights and clarification.
Given that the objective of the research is to understand the roles and
perceptions of the different stakeholders of a given value chain in sustainable
beef in Brazil, exploratory research turns out to be the most relevant. “A study is
classified as qualitative if the purpose of the study is primarily to describe a
situation, phenomenon, problem or event (...) and if the analysis is done to
establish the variation in the situation, phenomenon or problem without
quantifying it” (Kumar 2011). Hence the qualitative approach seems to be the
most appropriate to answer the research question. The data that will emerge will
be descriptive. The aim is to compare whenever possible the vision of the biggest
players expressed in the interviews to what is really happening on the ground
thanks to the three published case studies. However, all the subjects tackled
during the interview where not mentioned in the case studies so it was not
possible to address every category.
**Research setting:** The interviews took place from April 2nd to May 10th 2017 while the researcher was physically in Brazil and the case studies were analyzed in parallel.

We chose three field cases already published to illustrate the key roles a NGO (WWF), a federal state (Mato Grosso) and an international private organization (Sustainable Agriculture Network-SAN) can each play in developing sustainable beef at different levels in Brazil. They were chosen because each organization (WWF, the Mato Grosso state and SAN) plays a major role in sustainable beef at their own level. The first program is based on the action of the NGO WWF in Pantanal, we chose it to evaluate a local program promoting organic beef in a diverse biome designed by an NGO. Then we chose the Northern Mato Grosso example to illustrate local action taking place at a state level focusing on importing market standards. Finally, the focus will be on a voluntary international certification program with SAN 2010. Studying these programs is key to acknowledge how each stakeholder acts at his own pace and scale concerning sustainable beef. The aim of the research is to see if qualitative interviews of main stakeholders are in line with what is described in the cases.

For the interviews, a beef producer, an industrial, a retailer, a NGO and a state organization were selected as the main stakeholders of the Brazilian beef supply chain. Indeed, to answer the research question (How to align interests of the different stakeholders in sustainable beef production in Brazil?), it is mandatory to take into account the vision of main stakeholders. The interviewees were not chosen by convenience but because they are among the biggest players in the Brazilian sustainable beef market. They allowed their names and companies to be mentioned. Daniel Eijsink, Operations General Manager at Grupo JD, was chosen to get the vision of a successful beef producer, the farm Sao Marcelo. Indeed, the farm is a pioneer in research concerning sustainable beef at a global scale and it was the first farm in the world to obtain the Rainforest Alliance certification for cattle. Leonel Augusto Martins Almeida, Sustainable Development Manager at Marfrig, was chosen to present the vision of slaughterhouses concerning sustainable beef. This industrial has an exclusive contract with Grupo JD for Rainforest Alliance certified beef. Fernando de
Carvalho is Sustainable Development Director at Carrefour was interviewed to present the vision of one of the three major retailers in Brazil. The retailer distributes Rainforest Alliance certified products in its shops. Oliver Sage, International Amazon Campaign Director at Greenpeace, was chosen given the key role of the NGO Greenpeace in representing civil society and pushing for changes in the Brazilian beef industry. Since the Greenpeace report in 2009, it is the reference in Brazil concerning civil society representation. Finally, as Executive Director PCI (Produce, Conserve, Include) for the government of Mato Grosso, Fernando Sampaio was interviewed to understand the state approach toward sustainable beef development in the area. However, he is also a former Director of the Brazilian Beef Exporter Association (Associação Brasileira das Indústrias Exportadoras de Carne-ABIEC) and former Director of GTPS, so he has a global understanding of the different interests and the challenges the industry is facing.

**Data collection strategies:** Case studies were found via online research. Interview guides were sent at least 24 hours in advance for the interviewee to be able to prepare answers. Except for the one of Fernando Sampaio, they were organized in four parts: definition of beef sustainability, interactions in the beef supply chain, customers and certified sustainable beef and aligning interest of the stakeholders. The language used was English, as the research knew all the technical terms in English, it seems easier for mutual understanding. The researcher always presented the context and the objectives of the study. If existing, internal documents regarding the subject were also asked beforehand. The interviews were done over the phone with the interviewer taking notes. After the interview, the interviewer sent the written version of the interview to the interviewee for him to validate the final version and to make changes if necessary. He was also asked to send any additional documents of interest that could have mentioned during the interview.

**Figure 4: Generic interview Guide**
**Beef sustainability**

What does sustainability mean for you?

Is “Zero Deforestation” a priority for your company?

Who is in charge of sustainability in your organization?

Why is it important for you to develop sustainable beef?

Can you elaborate on the main initiatives you took concerning sustainable beef?

**The beef supply chain**

What kind of interactions do you have with Retailers? Other Slaughterhouses? NGOs (specific case of Greenpeace?) Producers?

Who has the most influence over the supply chain?

Do the banks have a role to play with a strict loan policy?

Is excluding some producers a viable solution?

Do you think there is a monopoly of slaughterhouses?

**Customers and certified sustainable beef**

What are the standards under which your beef is sold?

Is there a price premium for sustainable beef products?

**Align interests of the beef supply chain**

What can be done to align interests of the different stakeholders of the beef supply chain?

How can you measure levels sustainable development? Is it mandatory to create new tools?

Is the law an incentive towards sustainable beef in Brazil? Have there been recent improvements? What do you think of the Forest Code?

Are you a member of the GTPS?
**Data analysis procedures:** For the interviews, the researcher organized and prepared data manually. This is done when the interviewee sends a validated version of the interview. In the four subjects, the researcher tackled with each of the interviewee, the researcher read the data and organized it in themes. He then interpreted the meanings in a table with the potential actions or measures to be taken to make sure interests are aligned.

**Verification:** According to Creswell (2009), qualitative reliability indicates that the research's approach is consistent across different researchers and different projects. Checking transcripts twice (verification of the researcher and member checking) is a way to make sure the interviews do not contain obvious mistakes. Triangulating information will also be a way to make sure the findings are coherent. The researcher will also present discrepant information in the conclusion as each member of the supply chain has its own perspective on the subject. For verification purposes, the researcher gave the thesis to read by a third party to make sure there are no mistakes and that the content is clear to someone that is not familiar with the subject.

4  Results
4.1  Case studies of sustainable beef programs

4.1.1  WWF- 10 years of sustainable beef production in the Pantanal (2004-2014)

WWF Brazil started the project “Cerrado Pantanal Program” with sustainable livestock in 2003 in Pantanal, the planet's largest wetland. This region is located in the South West of the country in the state of Mato Grosso do Sul. Over 4,500 species have been registered there. The level of the rivers rises during the rainy season from December to January, causing flooding across the region. The low permeability of the floor explains and the flatness of the terrain explains how 80% of the area is flooded. It has been designated a World Heritage Site and Biosphere Reserve by United Nations Educational, Scientific and Cultural
Organization (UNESCO) but only 4.4% of the biome is conserved under protected areas. Cattle's farming is now the main activity of the region but it has been historically associated with low stocking rates.

The vision of conservation of Pantanal for WWF is to try to maintain the biological biodiversity and ecological processes along the Upper Paraguay River Basin while promoting sustainable development opportunities for the region, turning into an example of rational use of humid areas. WWF has supported the certification of livestock in 140 thousands ha in Mato Grosso do Sul. The NGO also supports livestock association in market analysis and research, good production practices, product promotion and interactions between the different stakeholders.

The project relies on the involvement of the Brazilian Association of Organic Beef Farming (Associação Brasileira de Pecuária Orgânica – ABPO) and more specifically on the involvement of its president, Homero Figliolini. According to his studies, there were “two major opportunities for the Pantanal: organic beef and eco-tourism”. The floodplain cannot stand intensive beef production and the use of technologies such as the introduction of African grass species. According to Embrapa Pantanal, producers have to frequently move cattle from different pastures to escape from floods and droughts that hinder intensive beef farming and contribute to the preservation of the area. In the end of the process, cattle are placed in the farms in the uplands for fattening. The idea was to move to organic beef and obtain a 10% price premium on it, which would double the profit while maintaining cost of production.

One of the takeaways is that trust is essential to the success of partnership. At first, farmers did not trust WWF as a partner and it took time to establish relationships. According to Alexander Bjork from WWF-US, “to be lasting, change must be led by farmers”. And farmers learn from other farmers. The main principles of organic beef are animal well-being, and restricted use of veterinary products to preserve the surrounding environment. Embrapa Pantanal helped
prove that some procedures such as giving does of antiparasitic drug to newborn did not harm the environment. It was the first time an NGO looked at the farmer profitability. Farmers manage to add a 10% extra value to the product even if certification generates costs in the first two years due to the paper work and major changes to implement in the production process. The tools used to evaluate rotational grazing management strategies and agro ecological methods were an educational booklet and two best practices demonstration units (Millenium Farm and Vo Tereza Farm). For instance, on the Millenium farm, the cost of health management based on the use of homeopathy and phytotherapy was 2,000 reais par head of cattle, to compare with the 15,000 reais average for beef farms that use traditional techniques.

WWF also asked the consulting firm AgroSuisse for a market study of organic beef produced in Pantanal that showed the necessity of communication, as 65.4% of the interviewees did not know what organic beef was. So WWF worked to structure the organic beef chain and organized the basis for a contract to supply meat to JBS that would be marketed as “Friboi Organic Beef” until 2010. Korin, known for selling free-range chicken and eggs, is now the new partner. The NGO Aliança da Terra was also in charge of auditing certified farms. WWF Brazil is one of the founding members of the GTPS.

Sustainable beef production in the Pantanal is environmentally friendly, respects labor laws, preserves the soils, strive for efficiency in the use of natural resources and ensures animal comfort and well-being. Apart from promoting best practices, the priority is to assist producer in registering in the CAR. The program has now been extended to other regions of Brazil (Amazonia) and to Bolivia and Paraguay.

4.1.2 An exploratory study of sustainable production standards practiced in the Northern Region of Mato Grosso

This report explores the use of sustainable production standards by agents involved in the supply chain of sustainable beef production in the northern part
of Mato Grosso. A slaughterhouse, a feedlot, an association creators and individual cattle breeder were selected.

Concerning the slaughterhouse, it needs to follow all the rules referring to sustainable standards. The process starts in the purchasing department of the slaughterhouse when the buyer checks if the cattle bought meets all environmental and social standards. Federal and State governments give the information. If there is any doubt, the purchase remains on hold until there is more clarity. The slaughterhouse is also responsible for meeting internal standards such as care about the open burning of residues or working conditions respecting ethical standards. The confinement activity was an extension of the activity of the slaughterhouse. This is where the process of traceability of the animals is controlled and the check is done that all requirements by importing countries are met.

Regarding cattle breeders, they must meet environmental, social and animal welfare standards. Environmental aspects refer to greenhouse gases reduction, protection of forests, and prevention of soil degradation and pollution of water resources. Social protection is related to slave and child labor. Concerning animal welfare, the producer must prove the animal did not suffer bad treatment and was traced from birth. Regulatory bodies such as Brazilian Institute of the environment and renewable natural resources (Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis-IBAMA), Secretary of State of the Environment (Secretaria de Estado de Meio Ambiente-SEMA) and the Ministry of Labor and Employment (Ministério do Trabalho e Emprego-MTE) issue the documents proving the respect of these standards. Breeders expressed difficulties in adapting to constant changes in the legislation and bureaucracy. The cost/benefit ratio of tracking technology is considered very low. One of the breeders interviewed also mention the great role of NGO’s regarding the implementation of rules. They also insisted on the great power of retailers. The perspective of the president of the association of breeders is similar to the breeder’s point of view.
The results of this case study show that the agents of the supply chain are concerned about meeting standards required by the importing market but that in practice they come to difficulties in obeying such requirements. Changes in legislation and bureaucracy as well as adoption of new technologies are considered the main obstacles towards sustainable beef development. Hence trying to align interests of stakeholders means tackling these difficulties.

### 4.1.3 SAN 2010 certification program – Certifying sustainability: opportunities and challenge for the cattle supply chain in Brazil

In this case study is analyzed the SAN *Standard for Sustainable Cattle Production Systems* certification program. Semi structured interviews were conducted with cattle supply chain key actors who identified barriers and opportunities to the development and scaling of the SAN program.

In 2010, the Sustainable Agriculture Network launched a standard for environmental and social responsibility in cattle production (SAN 2010). It aims at improving environmental sustainability in cattle production with a special focus on deforestation. It is considered the first voluntary certification program in the world for cattle sustainability. The network is a multi-stakeholder partnership of nine organizations in eight countries. The Rainforest Alliance trademark is a label for SAN certified products. It relies on a third party certification body (the NGO Imaflora) rather than on an industry roundtable. The certification involves a full initial audit and two subsequent annual audits. The farm Sao Marcelo was one of the farms certified for the *Standard for Sustainable Cattle Production Systems*. Greater effort is required by farms than slaughterhouses to be certified. The study showed the SAN cattle program is considered as a very high benchmark for sustainability. However, the changes required by the program are too demanding for a majority of beef producers in Brazil. Key barriers include low levels of compliance with environmental legislation, high costs of infrastructure required to comply with SAN 2010 and general poor access to information and assistance with respect to pasture management, production
control and forest restoration. There is very little information about the price premium received for certified beef by each of the actors of the chain. Producers claim their revenues have not sufficiently increased. The over problem is the lack of developed market for sustainable beef in Brazil. Most consumers still choose their meat based on price and quality. The supply chain is very complex and characterized by a large number of actors, who sometimes had historically tensed relationships. Moreover, if slaughterhouses pay a premium for sustainable beef, they are only able to sell certain cuts at a higher price while ordinary cuts are sold at the same price as a non-certified beef.

External interventions also had an impact on the SAN 2010 certification program. The ABC loan program awards long term loans to producer committed towards sustainability and carbon emission reduction. Unfortunately, the procedure to apply to these loans is quite complex hence the access is restricted to more organized producers. The Forest Code is considered by some to be the strictest legislation in the world concerning forest conservation. Landowners have to maintain a minimum proportion of forest in their area, the Legal Reserve (Reserva Legal) that depends on the region where it’s located. The environmental standards of the SAN program are directly based on the Forest Code. However, the reform of the Forest Code and its future implementation prevents producers from changing practices before knowing what exactly will be asked from them. Poor rural infrastructure also impacts the implementation of sustainability projects. Sometimes facilities for waste disposal are lacking in the village near the farms so the producers can’t comply with SAN requirements. Retailers such as Carrefour for instance promote SAN certified products in a comparable way as internal labels, which does not reflect the higher requirements for sustainability associated with SAN products.

Hence a possible improvement relies on direct recruitment of producers into the program. The SAN certification should keep up with this high standard while promoting the viability of sustainable beef in the country. Finally, it should develop a market for sustainability such as stimulating demand for sustainable beef in the country.
4.2 Takeaways of the interviews and case studies

The first takeaway of the interviews is that there is no universal definition of sustainable beef even if the interviewees gave similar definitions of sustainability around the 4 Ps. As seen in the literature review, sustainable beef is a general concept, which can be declined in many ways. Hence for industrial Marfrig, it’s “running your business in a long term perspective with growing awareness in the use of resources”. However, when applied to beef, the concept of sustainability does not appear as clear. For the NGO Greenpeace, “sustainable beef does not exist […] as the production of beef will always use land which can be used for the production of vegetable food and the side effects of production of meat goes hand in hand with climate change directly (methane) and indirectly (deforestation, other habitat loss for ranching)” (Oliver Salge). The terms responsible or ecological are more appropriate according to him.

All agree that given the projected increase in beef consumption in a global scale and the key role of Brazil in global production, it is mandatory to produce « better meat ». This confirms what was seen in the literature review.

Concerning corporate social responsibility, the stakeholders are each organized differently. In the farm Sao Marcelo, no one is really in charge of sustainability and the entire approach of business is sustainable. On the contrary, Marfrig and Carrefour have a dedicated department in their company. Moreover, Marfrig has two persons in each site working full time on sustainability hence in total there are thirty people directly involved in sustainable development. Carrefour has only tree people working in the headquarters on sustainable development but they try to push it to other departments as well.

All stakeholders see zero deforestation as a priority. This confirms what we saw in the literature review that after 2009 deforestation became a hegemonic topic for all stakeholders. For Greenpeace, “zero deforestation means the end of deforestation and the conversion of former forest land into agricultural use. It’s a
priority for biodiversity, climate and human rights reasons”. According to Daniel Eijsink from farm Sao Marcelo, “there is no need to deforest anymore to raise productivity” so this objective is realistic. However, concerning zero-deforestation agreements, “lots of loopholes remain to be closed and lots of additional measures need to be taken to tackle indirect supply of cattle. This is supply for directly supplying farms, which on their own buy from uncontrolled third parties, risking to contaminate the supply of slaughterhouses with cattle from dodgy origin” (Oliver Salge).

In order to produce more sustainable meat, each of the stakeholders of the sustainable beef supply chain took different initiatives at their own level. This confirms the heterogeneity of sustainable beef programs observed in the case studies in terms of scale (local, regional, national) and main actions.

The NGO Greenpeace did so by publishing reports denunciating the bad practices of the industry linked with deforestation and human rights violation and urged the industry and its consumers to go for a change. As studied in the literature review, they entered into negotiations and the three leading slaughterhouses (JBS, Marfrig and Minerva) signed anti deforestation commitments in 2009. They each established a monitoring system to control the purchase of meat from direct suppliers. However, according to the International Amazon Campaign Director at Greenpeace, additional measures need to be taken to tackle the indirect supply of cattle to prevent laundering processes. The case study on Mato Grosso also underlines the great role of NGO concerning the implementation of rules.

To develop more sustainable beef, the farm Sao Marcelo initiated genetic programs for cows to gain more weigh eating less and grow more rapidly. They also joined the Rainforest Alliance certification program. They also donated reserves to the world, which means if one were to buy the land he could not deforest it. They also facilitate access of health specialists to local communities. All their actions are undertaken at a local level.
On the industrial side, Marfrig developed several labels such as the Marfrig club, aimed at sharing best practices in livestock production “concerning animal respect, social respect and environmental respect” (Leonel Almeida). Progress is checked during farm visits. They have target of 100% of farms participating in 2018. They also work with several NGOs such as Greenpeace, InPacto or WWF on commitments or developing specific programs concerning environment protection and slave labor. They are also a member of the Tropical Forest Alliance as part of the Consumer Good Forum and committed to protect the forests.

Retailer Carrefour launched the program “Plataforma de Pecuária Sustentável” in Mato Grosso to ensure meat sold in stores does not come from deforested areas. According to Carrefour internal documents, the slaughterhouses will install the geo-referencing platform in their plants with the support of the retailer and its partner Agrotools. They will enter the geographical information of their meat suppliers and this information will be crossed with official data to make sure the meat sold in stores respects the five criteria (no destruction of the Amazonian forest, no use of indigenous lands, no destruction of Conservation Units containing biodiversity, no use of lands under embargo after environmental crime, no use of slave work). Carrefour is the second retailer to implement a control system of its beef supply after Wal-Mart in the country. At the moment, three label meats are sold in stores (Rainforest alliance, Alianza del Pastizal and garantia do originem).

For GTPS, main initiatives rely on “organizing trainings on technical systems, guidelines and tools” with the principle of training the trainers for continuous improvement (Fernando Sampaio). On the other hand, ABIEC started mapping all farms and crossed their findings with external information to make sure they were not located in illegal sites. This was aimed at making sure of the origin of exported meat. At the federal level, the government of Mato Grosso started the PCI (Produzir, Conservar, Incluir) program to mainly restore pastures, end illegal deforestation and give technical assistance to family farmers. The PCI was initiated by a coalition including the government of Mato Grosso, private sector,
civil society and people representing farmers. Hence it is an example of initiative gathering all stakeholders.

Thus we see that like in case studies, all the interviewed stakeholders understood the importance of developing a more sustainable beef product and each player took its own initiatives to improve the situation.

Banks also have a role to play to develop a sustainable beef market in Brazil even if their power is limited. According to Marfrig, “the culture of producers in Brazil is to work without the help of banks”. For Fernando Sampaio, banks should play a bigger role in creating new financial products such as refinancing reforestation. Indeed, to him there is enough rural credit in Brazil but it does not go where necessary and rates are too high at the moment. Credit should be concentrated in the areas in which we want to intensify production.

Concerning the beef supply chain, we can conclude from the interviews that there are frequent interactions between the different stakeholders even if the market is very competitive. However, the interviewees disagree on the stakeholder having the most influence. Fernando Sampaio refers to a top-down dynamic in which “the producers are imposing a lot on the consumers”. The farm Sao Marcelo agrees on the importance of financing for farmers to adopt new technologies but states that it is the consumer that influences the entire supply chain. It is also the point of view of retailer Carrefour and of industrial Marfrig. According to industrial Marfrig, there is no monopoly of slaughterhouses because the three major slaughterhouses combined only control 30% of national beef market. Hence even if we hear a lot about the monopoly of slaughterhouses in the Brazilian beef market, the consumer and civil society in general seem to be more powerful in imposing new measures and market trends.

And the value attributed to sustainable beef products is not always translated in the price.
Indeed, surprisingly, beside the multiplication of private labels studied in the literature review, it seems that there is no real price premium associated with
sustainable beef products. As Fernando Sampaio recalls it, 20% of national beef production is exported and foreign consumers of Brazilian beef (China, Russia, Saudi Arabia) are sensible to cheap products. Only a “niche market” is charging extra price and this is only possible when there is cooperation in the value chain like in the Rainforest Alliance program. The WWF case study also confirms the existence of a price premium of 10% for the niche market of organic beef sold under the label “Friboi organic meat”. Even though, the farm Sao Marcelo had to stop producing organic products because less chemicals meant deforestation if they wanted to increase productivity.

On the contrary, the SAN 2010 case study concludes on the lack of information concerning price premium. They also claim their revenues have not sufficiently increased because only certain cuts of beef have a higher price in an underdeveloped sustainable beef market. Hence to Fernando Sampaio, “certification is not a solution”. Carrefour has the same opinion and this explains why they chose not to create a label for the program “Plataforma de Pecuária Sustantável” but instead will focus on communication in the Media and trainings in stores to inform consumers. For the retailer, price premium is not mandatory for profitability as sustainable beef production increases efficiency after the initial investment is repaid. Marfrig shares this view as “investments are made only to make producers more efficient and hence more profitable”. These investments are considered as internal costs to keep their market share in the long term. This is also the conclusion of the WWF case study. For the NGO, the environmental protection of the Pantanal brings more efficiency, in terms of health management for instance (13,000 reais saved by head of cattle using natural medication). The fact that none of the interviewee knew about the SAN 2010 certification program also proved that labels are no recognized even by professionals of the sector.

Thus, national and international consumers don’t pay more for sustainable beef products compared to regular ones because they are more sensible to quality and price than sustainability. However, this is not an obstacle for the stakeholders to invest in sustainable beef programs because they increase the overall efficiency of farms, leading to more productivity covering the initial
investment. As seen in the literature review, insisting on the sustainability of national beef products can be a way to restore Brazil’s image as a country of origin. Indeed, according to Fernando Sampaio, “we have to give some value to what has been done in Brazil”.

Aligning the interests of the different stakeholders in the Brazilian beef supply chain appears as “one of the main challenges“ of the industry (Carrefour). Since “the future expansion of agriculture can be done on the same pastures” (Fernando Sampaio), the objective of zero deforestation is reachable. According on a common definition of sustainable beef would be the first step. For farm Sao Marcelo, it goes through understanding precisely consumer needs while for Marfrig the right path would be to define objectives and then to design an action plan. For Carrefour, it is also important to discuss point of disagreement instead of focusing on consensus. Greenpeace states that stakeholders should focus on common interests rather than differences.

Excluding producers is not seen as a viable solution because they would find ways to introduce their dirty meat in the market anyway. As Fernando Sampaio states it "the big players get all the pressure and small local markets sell beef with no control". Indeed, big players are already very involved with sustainability. If we consider sustainable beef means no deforestation, no slave labor and no environmental problems, than 100% of the beef Marfrig sells is sustainable. Hence increasing sustainability in the beef supply chain means associating small players. Indeed, according to the SAN 2010 case study, the changes required by this program are too demanding for the majority of beef producers. Indeed, according to the farm Sao Marcelo, “it is easier to cut a tree than to buy a new technology to increase your productivity in the same area” (Daniel Eijsink). Hence supporting small players is mandatory to operate changes towards sustainable production in the entire beef industry. Marfrig offers different sustainable beef programs and producers are free to chose the most relevant one. According to Fernando Sampaio, “there are lots of challenges for producers: access to credit, technology, capacity building and farm management system. A small part of producers are very efficient in terms of
pasture management and genetics for instance so they make the money. We estimate that they are around 150,000. Another 350,000 producers are operating in line of financial profit but if they don’t improve, they will have to quit the activity. One million of farmers is already loosing money. Pasture is degrading so they have fewer animals and less money. Some are renting their lands to agriculture farms but not all the areas are suitable to agriculture. Some have a compliance problem with the Forest Code. Anyway the price is always set by the more efficient”. Hence it is mandatory to help small farms that are already losing money.

Most of the interviewees also mentioned the importance of increasing communication between stakeholders. As studied in the literature review, exchanging market information could be a way to reduce transaction costs in a stakeholder management perspective. According to Fernando Sampaio, “information should be shared on both sides: where the meat is going and where the meat comes from. Consumer feedback is very important; a map of quality should be drawn according to consumer feelings”. At the moment, “clients don’t seem to worry about how the product is produced” (Carrefour). Talking and active listening are necessary to define common objectives taking into account stakeholders interests and then to be transposed in a common agenda. Moreover, listening to consumer and having frequent feedbacks on the quality of the meat and relevant characteristics will allow beef products to adapt to consumers’ needs.

The question that remains is who should be in charge to lead such discussion and cooperation? No one seems to agree on this question. Fernando Sampaio thinks GTPS is the place to organize the debates whereas Carrefour would see ABIEC as a good leader. However two interviewees (Greenpeace and the farm Sao Marcelo) are not members of the GTPS. Hence, Marfrig sees the retailers as the best to lead the discussions because they are the closest to consumers. Anyway an organization should be defined responsible to coordinate all the work and discussion among stakeholders.
All interviewees insisted on the importance of implementing existing measures in a country in which bureaucracy is omnipresent. Indeed, as seen in the Mato Grosso case study, bureaucracy and constant change in legislation are still a major obstacle for breeders to move to sustainable beef production. The behavior of the WWF in educating farmers and assisting producers in registering in CAR seems the right approach. One of the projects of the farm Sao Marcelo is also to help small farms with government procedures and financial institutions.

The Forest Code is a powerful tool but it is not totally implemented. “If it was totally applied it could become a very efficient tool” (Fernando de Carvalho). Marfrig also sees the code as “one of the best of the world”. It is also a conclusion of the SAN 2010 case study for which Forest Code implementation is an important parameter. Hence putting the code into practice should be one of the priorities if Brazil wants to become a role model in sustainable development. Indeed, as Fernando Sampaio underlines it, “we are talking about a global environment in Brazil so the idea of controlling one supply chain will not solve the problem”. This is why public action is important to coordinate all initiatives regarding sustainable development. Only Oliver Salge from Greenpeace thinks the law does not support the production of sustainable beef and should be reinforced.

Figure 5: Roadmap to align interest of stakeholders in sustainable beef production in Brazil
More specifically to the beef industry, current tools seem to be sufficient to monitor sustainability. For instance, GTPS developed a tool, “Indicator Guidebook for Sustainable Livestock” with KPI’s to evaluate levels of production. This will help farmers evaluate where they stand in terms of sustainability. On the other hand, there has been a multiplication of monitoring systems in recent years. For Fernando Sampaio, “what has been done today is crazy: repeating monitoring systems. It would be cheaper for everyone if the information could be shared. There is no reason why supermarkets should monitor farms. The slaughterhouses should do that”. Carrefour agrees on this point as for them “slaughterhouses are in charge of implementing the tracking system” (Fernando de Carvalho). This opinion concords with the results of the case study in Mato Grosso according to which the cost/benefit ratio of racking technology is considered very low for the breeders. Hence, the other priorities for the industry is to harmonize monitoring systems in order to unify the information and facilitate tracking processes. Carrefour is already talking to Wal-Mart and Grupo Pão de Açúcar to adopt the same protocol and to prevent confusion for suppliers. Indeed, they are aware that an individual company can’t implement a global solution. According to Fernando de Carvalho, the supermarket association (ABRAS) could lead the discussion because it also includes smaller players. This
is in the interest of all stakeholders that are each paying to get the same information.

5 Conclusion and Limitations

As Brazil is the first beef exporter in the world, stakeholders have done a lot to develop sustainable beef production in recent years. This accelerated with the pressure of Greenpeace, which linked directly Amazonian deforestation and slave labor with beef production in the country. Producers, industrials, retailers, NGO’s and public institutions are each conducting projects at their own level. The implementation of geo referencing tracking systems and genetic improvement programs are part of the main initiatives.

Comparing the case studies with the interviews, we see that the vision of main stakeholders matches the reality on the field. Overall, all stakeholders agree on the importance of developing more sustainable beef production consuming less resources and preventing deforestation. To align particular interests of stakeholders in the sustainable Brazilian beef chain, it is key to conclude on a common definition of sustainable beef and to design an action plan with precise and harmonized commitments. This is necessary to be able to produce beef respecting this definition at a minimal cost and at a national scale. Effective supply chain management based on Lambert & Enz framework will allow implementing this action plan via partnerships with key customers based on shared values (Lambert & Enz, 2016).

An institution should be chosen to coordinate all actions and programs because lots of initiatives are taking place at different levels with a lack of global coordination. So far, GTPS, ABIEC and retailers have been mentioned to lead the discussion. Along with this action plan, public action should continue to achieve the Forest Code implementation and guarantee a favorable legal environment. Monitoring systems should also be harmonized to prevent everyone paying a high price to get the same information.
The success of aligning interests to this common cause will rely on communication between stakeholders but also with final consumer. Labels are not a solution because they don't mean anything for the consumer. No price premium should be expected but efficiency improvements will directly increase productivity. Promotion of commitments should be done via trainings in stores and communication campaigns in the Media. As Leonel Almeida from Marfrig states it, “when consumers buy a package of meat they have to be aware they buy a package of technology, of social responsibility”.

One of the main challenges would be to make sure smaller players (producers, industrials and retailers) are participating to the discussions to prevent laundering processes. No producer should be excluded. Indeed, the market is very fragmented and competitive so small players represent a major part of global beef production. This will require technical and financial support from banks with products developed specifically with long-term rates. It is also mandatory that they get direct support to go through heavy procedures like CAR registration.

However, producing better meat will not be enough to face the future growth in meat consumption and we will have to change our consumption habits. “If we want to live in a livable world, tackling climate change, we need to end eating meat everyday, we need to achieve a time where we eat better meat (ecological or close to ecological) and less meat (up to 50% reduction)” (Oliver Salge).

Concerning the limits of the research, the main bias the researcher sees is that only a given supply chain with big players was studied so it can't be generalized to the entire industry. The point of view of small players is not represented and only “best in class” organizations were interviewed. The interviewees were also precautious when talking of stakeholders as they were referring to commercial partners so they might have felt like they had to be politically correct. They also might have felt restrained from talking freely about some practices for confidentiality reasons. They also expressed their personal
opinion, which can be slightly different from the values of the organization they represent.

Further research could focus on the situation of these smaller players and the obstacles they have to face when moving to sustainable practices in terms of adopting new technologies and financing. Indeed, they still represent an important part of total production but their practices are not controlled as the ones of the biggest players are. Additional research on consumer behavior can also be interesting for the beef supply chain to communicate efficiently on new product features to replace labels.

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7 Appendix

7.1 Expansion of cattle heads in the Brazilian Amazon between 1996 and 2006.

7.2 Brazilian base case GHG emissions by sector in 2005 and 2030
Source: McKinsey
7.3 Word Cloud of the slaughtering the Amazon report
Source: Peinado Gomez, 2014
7.4  Beef simplified supply chain and its concentration components  
Source: Guides Pinto 2010

7.5  Unregulated beef supply chain  
Source: Gibbs 2015
7.6 Interview with Mr. Leonel Augusto Martins Almeida, sustainable development manager Marfrig

**Beef sustainability**

**What does sustainability mean for you?** It means running your business in a long-term perspective with growing awareness in the use of resources.

**Is “Zero Deforestation” a priority for your company?** Yes, and we have reached our objective. Thanks to our monitoring system, we make sure every cattle we buy does not come from a deforested area. We have an agreement with the NGO Greenpeace.

**Who is in charge of sustainability in your organization?** There is a sustainable department in our company, and we have also two people responsible for sustainability on each site. In total, we have around 30 people working full time on this subject since 2007 until now.

**Why is it important for you to develop sustainable beef?** It is important because Latin America and more specifically Brazil are major players in beef production because extension and weather conditions. The protein demand is expected to increase in the coming years so it is important to encourage all actions concerning sustainability. If we consider sustainable beef means no deforestation, no slave labor and no environmental problems, then 100% of the beef we sell is sustainable. Labels only concern a small percentage of our global sells.

**Can you elaborate on the main initiatives you took concerning sustainable beef?** We have many programs:

- “Marfrig Club”: To share best practices in livestock product concerning animal respect, social respect and environmental respect. Progress is checked during farms visits. The main objective is to increase production. We have currently 6,000 farms participating and the target is to reach 100% in 2018.
- We also promote some labels like Rainforest Alliance, Alianza del Pastizal in the south of Brazil in the Pampa biome
- Partnership with the NGO TNC (The Nature Conservancy) to help develop sustainable production and share best practices (genetics, social conditions, pastures)
- Socio Environmental Monitoring system
- Member of the national GTPS and the global roundtable (GRSB)
- Tropical Forest Alliance (TFA) 2020 as a part of the consumer good forum. We have a commitment to avoid deforestation and to preserve the forests.
- Work with the NGO WWF on collaboration for food and agriculture. It lead to a decision support system in Brazil in which you can enter
information about the type of cattle you need and the software will indicate the best location for instance (Working Group to Support Livestock Decision)

- Commitment with Greenpeace since 2009
- Commitment with the NGO InPacto against slave labor

The beef supply chain

What kind of interactions do you have with?

- Retailers? How do you do to align with the monitoring system of each retailer? How do you share costs? We have commercial relations with them. With the increasing demand for transparency in our production systems (origin, traceability, quality), we have more interactions to transfer information from the producers. We are also working on a common monitoring system. Slaughterhouses are paying for the tracking system.

- Other slaughterhouses? Yes with JBS and Minerva have a very similar tracking system but we don’t interact much because the market is competitive. However we collaborate on the type of criteria we use to check the monitored information (Zero deforestation or legal deforestation for instance).

- NGOs (specific case of Greenpeace?) We have a really good relationship with NGO’s. Marfrig wants to be a pioneer in sustainable beef and the NGO represent the consumers so it’s really important to have frequent contacts to be one step ahead of the market.

- Producers? We have different programs to offer opportunities for producers (Marfrig Club, Angus Program, Nelore Breed Program, Rainforest Alliance, Allianza del Pastizal, Rebanho do Xingu). With this it is possible for the producers to choose the best program according to their production system, and with that, get the best possible result with the tools they have in hand.

Who has the most influence over the supply chain? The consumer! When they buy a package of meat, they have to be aware they buy a package of technology, of social responsibility. It is very important to make efforts for the consumer to understand the quality of beef.

Do the banks have a role to play with a strict loan policy? Yes, but it’s limited since the culture of producers in Brazil is do work without the help of banks. So banks are limited on this segment.

Is excluding some producers a viable solution? Depends of the criteria you used to exclude them. It’s not a good option if all the industrials don’t have the same criteria because the excluded producers would be able to sell to others.
Do you think there is a monopoly of slaughterhouses? Do you have an idea of your market share if it’s not confidential? I don’t think there is a monopoly of slaughterhouses. According to ABIEC, the three major slaughterhouses combined have only 30% of the total market.

Customers and certified sustainable beef

What are the standards under which your beef is sold? Rainforest Alliance, Alianza del Pastizal, Marfrig Club, Rebanho do Xingu

Is there a price premium for sustainable beef products? No, investments are made only to make producers more efficient and hence more profitable. For example, we started a program to disseminate Angus beef in Brazil. These investments are considered as internal costs to keep our market share in the long-term.

Do you export a part of your beef production? According to studies, European consumers would be more sensible than Brazilian consumers towards sustainable beef. 50% of our total production is exported. The main importers are China, Middle East and Europe.

Align interests of the beef supply chain

What can be done to align interests of the different stakeholders of the beef supply chain? I think the first thing is getting a common definition of what we want as a chain and then develop an action plan. GTPS is already working to get this kind of standards but they focus on techniques and not on targets. Their job is very important but the focus should be different if we want to align interests. Retailers are the best to lead these discussions because they are closer to consumers.

How can you measure levels sustainable development? Is it mandatory to create new tools? Current tools are enough but they should be more spread along the supply chain. There is a software adapted to every producer but only some use it so we should increase this usage.

Is the law an incentive towards sustainable beef in Brazil? Have there been recent improvements? What do you think of the Forest Code? Forest Code is a very actual law and one of the best of the world. The CAR (environmental register) is being implemented and then we need to check if the information is correct. So the legislation is fine but we have to put it into practice and include more people.
7.7 Interview Mr. Daniel Eijsink Operations General Manager Grupo JD

Beef sustainability

Can you present your activities in a few words?

We have three different activities:

- Grape producing (Fazendas Labrunier)
- Cattle producing (Fazendas Sao Marcelo). We were the first cattle producer in the world to be certified Rainforest Alliance. We have really high quality standards. We aim at increasing yield in the same land while controlling our social and environmental impact.
- Bravis (agricultural trading company)

What does sustainability mean for you?

It refers to the long-term business, the relationship we have with the environment and people. “Environmental and social friendly, financially and economically healthy, work to be more productive in the same area”. Hence innovation is really important for us with genetic programs for the cows to gain more weight eating less and growing more rapidly.

Is “Zero Deforestation” a priority for your company?

Our priority is to have less deforestation than rates allowed by the government. Our goal is “zero illegal deforestation”. The law allows deforesting 50% of our land in the Amazon. Today 60% of our area is forested. There is no need to deforest anymore to raise productivity.

Who is in charge of sustainability in your organization?

No one, it’s part of our every day activities.

Why is it important for you to develop sustainable beef?

There are two main reasons:

- Inside the fence, having the Rainforest Alliance label helps us to get better results and to increase productivity. We have to explain every thing we do, it’s a daily challenge.
- Commercial purpose: we produced high quality beef with premium price. There is a sustainable premium price. We don’t export our meat directly but we have an exclusive contract with Marfrig and they export our meat in Germany for instance. We also sell our leather to Gucci. Their bags
contain a passport with the history of the farm and our sustainable practices.

**Can you elaborate on the main initiatives you took concerning sustainable beef?**

On the environmental side, we donated our reserves to the world. This means that our forests are now protected and if one were to buy the land he could not deforest it. On the social side, we facilitate the access of communities to health specialists. Last year, a cancer specialist came to diagnose women in the region. Finally, we always aim at increasing yield in the same land to increase profits without increasing the use of chemicals or deforestation rate.

**The beef supply chain**

**What kind of interactions do you have with?**

- **Retailers?** We only have indirect interactions. Some meetings to market our products but no sales.

- **Slaughterhouses?** We have an annual contract with Marfrig. It’s a long-term relationship as they are involved in Rainforest Alliance as well.

- **NGOs (specific case of Greenpeace?)** Not a frequent contact. We sometimes meet during events.

- **Other stakeholders of the beef value chain?** We have interactions with other farms. In our farm in the North, we organize an open day to give local farmers an update of our project and new technologies. We welcome around 200 people so they can repeat the experience. On the other hand, we are part of a Rainforest farmer group with 4 other big farms in the country.

**Who has the most influence over the supply chain?** The consumer

**Do the banks have a role to play with a strict loan policy?** Yes because it is easier to cut a tree than to buy a new technology to increase your productivity in the same area. Financial programs are very important.

**Is excluding some producers a viable solution?** Excluding producers is a problem. They don’t have any support from the government. Because of the bureaucracy, the process is so slow that there are many delays to be reintegrated.

**Do you think there is a monopoly of slaughterhouses?** Yes, is concentrated in three big companies in Brazil. But I believed if you have a good product (quality + sustainability), you still can get a good program with these companies and other slaughterhouses in Brazil.
What kind of technology do you use in your ranch? We use genetic technology and biology control to prevent disease. We also use Agrotools to monitor our farms and the farms we buy meat from.

Customers and certified sustainable beef

What is the sustainable standard of your beef? Rainforest Alliance. We stopped organic products because less chemicals meant deforestation if we wanted to increase productivity.

Have you heard about the SAN 2010 certification program? No

Is there any communication on the value of the premium? Is there a guarantee for a sustainable beef producer to get financial returns? How to make sure that the premium is distributed evenly along the supply chain? How can we encourage consumers to pay a price premium? Chicken and egg problem (Not enough suppliers to promote it) Quality is mandatory for sales. Between two products of the same quality, clients would choose the sustainable one. You can get a very good premium. We need a better communication with final client to explain where the beef comes from, what is sustainable about it. This can be done via Media (newspaper, social media) or via trainings in stores for the sellers to be able to communicate properly with customers.

Align interests of the beef supply chain

What can be done to align interests of the different stakeholders of the beef supply chain? The first thing is that it is very important to understand the products the consumer wants. More communication between stakeholders will help aligning interests.

How can you measure levels sustainable development? Is it mandatory to create new tools? Tools are good. Agrotools measures deforestation level. To measure social improvements, we administrate questionnaires inside and outside the farm. For productivity, we calculate the number of heads by ha and the number of meat kilos that were produced in the same area.

Is the law an incentive towards sustainable beef in Brazil? Have there been recent improvements? The law is good in theory but in practice the system should be improved. Papers have to be approved more rapidly, especially because most farms are located in isolated areas with no access to Internet.

Are you a member of the GTPS? What role do you think it should have? Are you aware of all the actions that are coordinated? Not a member because it would mean too many meetings.
What are your projects in the next few years? Help the small farms close to our farms together with the government and financial institutions.

7.8 Interview Mr. Fernando Careli de Carvalho, Sustainable development director Carrefour Brazil

Context of the interview: “For me aligning interests is one of the main challenges”

Beef sustainability

What does sustainability mean for you?

It’s a global concept with the three fundamental dimensions: social, economic and environmental. For Carrefour, it means taking care of resources and people. It involves all the stakeholders of the company.

Is “Zero Deforestation” a priority for your company?

Yes, it’s a priority for our company with a global commitment to end deforestation by 2020 as part of The Consumer Good Forum (CGF) goals. Concerning sustainable beef, it should not be the only focus.

Who is in charge of sustainability in your organization?

They are three persons directly in charge of responsibility in our organization. Our role is to push this concept to other departments as well.

Why is it important for you to develop sustainable beef?

It is very important in Brazil for cultural and economic reasons. First beef is part of our vocation, which means that beef is a component of every day meals and it is very common for Brazilians to have relationships with farms. Second it is important for the future if Brazil wants to keep its ranking as one of the first producers.

Can you elaborate on the main initiatives you took concerning sustainable beef?

We launched “Plataforma de Pecuaria sustentável” last August in Cuiaba to ensure that all the meat sold in our stores does not come from deforested areas. The main challenge will be to communicate with consumers. From interviews we organized with clients, we understood that Carrefour’s strong commitment towards quality was difficult to explain. Clients don’t seem to worry about how the product is produced. Labels don’t work well because there is a lot of
misinformation. The consumer doesn't understand what certified products mean. So we think creating a new label for this program is not a good solution. Instead we want to use our stores and social media to explain the whole story. It would be more like “if you choose to buy this product, this is what it means”.

At the moment we have three certified meats in our stores: Rainforest alliance, Alianza del Pastizal and garantia do originem.

Do you remember the impact of the 2009 Greenpeace report?

I was not working at Carrefour at the time but we still refer to it today as the change it induced is still on going.

The beef supply chain

What kind of interactions do you have with?

- **Other retailers?** We interact a lot with with Grupo Pao de Azucar (GPA) and Wal-Mart as we know that an individual company can't implement a global solution. We want medium and small retailers to be involved in the discussion via the supermarket association (ABRAS). Indeed, there is no big player in the beef market in Brazil; even if Carrefour is a leader, I think its market share represents less than 10% of the beef market. We are currently trying to adopt the same protocol because inside our platforms, each retailer has different criteria. We are trying to adopt a common vision to prevent confusion for suppliers.

- **Slaughterhouses?** We have fewer interactions with slaughterhouses. We are parts of several working groups. They will be in charge of installing the tracking system of the “Plataforma de Pecuaria sustantavel”.

- **Ranchers** (specific case of Fazenda Sao Marcelo?) The commercial team has frequent interactions with them. They have to make sure that the production is aligned with our criteria, especially for our branded products. There are frequent audits.

- **NGOs** (specific case of Greenpeace?) We have a lot of interactions with NGO’s. If you want to really transform the supply chain, civil society is very important. Today with Greenpeace we almost have a “partnership relationship”.

**Who has influence over the supply chain?** Retailers can influence but to me the real influencer is the government. Indeed, producers are always worried about legislation and taxation. On the other hand, consumers (including retailers) as a whole group have a major influence.

**Do the banks have a role to play with a strict loan policy?** Yes banks have a role to play. The supply chain is not restricted from supplier to consumer. Banks
and primary goods suppliers are also stakeholders of the supply chain. Stricter loan policy is a very good idea.

Is excluding some producers a viable solution? It’s not a viable solution but it is the only solution we have for now.

How technology impacts the beef supply chain? Technology offers new tools and allows us to become more sustainable. On the other hand, consumers are more powerful to search for information and it might influence their perceptions.

Customers and certified sustainable beef

How important is branding? As our research confirmed, consumers don’t understand labels or branding for meat products. They don’t see any value if costs increase.

Have you heard about the SAN 2010 certification program? No.

What is the price premium for sustainable beef products? Premium is only mandatory at the beginning to compensate for initial investments. After a while, the sustainable production is not only the same price as regular beef but also more efficient. To illustrate this, for the program “Plataforma de Pecuaria sustantavel”, part of the tools is paid by Carrefour and slaughterhouses that can contract AgroTools or another supplier to follow the protocol pay the other part.

Is there a guarantee for a sustainable beef producer to get financial returns? How to make sure that the premium is distributed evenly along the supply chain? How can we encourage consumers to pay a price premium? This is not a problem as sustainable beef is profitable after initial investments are repaid.

Do you agree that Brazilian customers are more focused on price and quality rather than sustainability? Europeans consumers are more sensible? Focusing on exports could be a good way to promote sustainable brands? We don’t export any Brazilian Beef in our stores in Europe. But it’s true that Europeans consumers are more concerned about sustainability whereas Brazilian consumers value quality in meat products. They would be willing to pay more for it.

Align interests of the beef supply chain

What can be done to align interests of the different stakeholders of the beef supply chain? Brazilian Beef Exporters Association (ABIEC) should be in charge of this. They should communicate with farmers with a focus on efficiency. Their
current speech is oriented toward “Farmers are victims” so they should change attitude and be in charge of the transformation. Indeed, they understand the importance of global process and farmers can understand how technical progress is key to limit the use of resources. We are talking about money here.

How can you measure levels sustainable development? Is it mandatory to create new tools? Current tools are not sufficient. GTPS developed a tool, “Indicator Guidebook for Sustainable Livestock” with KPI to evaluate level of production. Now the discussion is around the implementation. The tool could be efficient but it will take a very long time to be effective.

Is the law an incentive towards sustainable beef in Brazil? Have there been recent improvements? The Forest Code is a very good law but we are very far from implementation. If it was totally applied, it could become a very efficient tool.

As a key member of the GTPS, what role do you think it should have? Are you aware of all the actions that are coordinated? They had a key role at the beginning but now it represents just part of the discussions. This group is based on consensus and because of this they prefer not to discuss the points of disagreement. We are trying to engage with them again.

7.9 Interview Mr. Oliver Sage, International Amazon Campaign Director at Greenpeace

Beef sustainability

What does sustainability mean for you?

Sustainability is a lifestyle of a production of goods, which is sustainable in the meaning of the word, it has no or minimal impacts on using resources, the emissions of climate gases, compared to the situation the product is not produced or consumed.

Sustainable beef does not exist for Greenpeace, as the production of beef will always use land, which can be used for the production of vegetable food and the side effects of the production of meat goes hand in hand with climate change, directly (methane) or indirectly (deforestation, other habitat loss for the ranching).

Why is zero-deforestation a priority in Brazil?

Zero deforestation means the end of deforestation and conversion of former forestland into agriculture use. It’s a priority for biodiversity, climate and human rights reasons.
Just thinking on the reduction of climate gases, the deforestation per year in Brazil, recently reaching up to 800,000 Hectares, is a main contributor to Brazil’s emissions.

**Why is it important to develop sustainable beef?**

See above, we believe sustainable beef cannot exist, using the meaning of the term. Even if the industry, key word GPRS, tries to implement such a thing, GP believes, maximum one can produce responsible beef, which needs to go hand in hand with a drastic reduction of meat on a global scale.

If we want to live in a livable world, tackling climate change, we need to end the age of meat eating every day; we need to achieve a time where we eat better meat (ecological, or close to ecological) and less meat (up to 50% reduction).

**Can you elaborate on the main initiatives you took to encourage the industry to adopt sustainable practices?**

We published on a global scale, that their business is dirty, contaminated with illegalities, linked to deforestation and human rights violations, and urged the industry and its customers, to go for a change.

**Do major slaughterhouses respect the zero-deforestation commitments signed in 2009? What is left to be done?**


They established each of them a monitoring system to control the purchasing of cattle from its direct suppliers, trying to minimize the risk associated to buying cattle from the Rainforest region in Brazil.

As of today, lots of loopholes remain to be closed and lots of additional measures need to be taken to tackle indirect supply of cattle. This is supply from directly supplying farms, which on its own buy from uncontrolled third parties, risking to contaminate the supply of the slaughterhouses with cattle from dodgy origin.

The purchasing from farms invading recognized indigenous lands needs to be stopped urgently, as it results in violence and human rights abuses.

Greenpeace has urged all signatories of the agreement to act asap to tackle this issues, among others.

**The beef supply chain**

**What kind of interactions do you have with?**
- Retailers?

Regular exchange of progress of implementation of the slaughterhouses, regular request for updates on the implementation of retailers own zero deforestation commitments, face-to-face meetings.

-Slaughterhouses?

Regular exchange of progress of implementation of the slaughterhouses, regular request for updates on the implementation of retailers own zero deforestation commitments, face-to-face meetings.

Who has the most influence over the beef supply chain?

I think there are many options to answer. Certainly the slaughterhouses are key to implement their own policies, strengthen them in regard to Zero deforestation.

However, the government of Brazil at the moment is hindering various important steps to be done, so partly the companies need to convince the Government to act accordingly.

Is excluding some producers a viable solution?

Yes, if it comes with understandable rules, one can copy easily, resulting in a new possibility to sell again. See here study from Holly Gibbs on Soy and Cattle moratoria impacts on farmers’ decisions to deforest or not.

Do you think there is a monopoly of slaughterhouses?

Partly it’s an Oligopoly, or moving towards a Monopoly, at least in some regions where the largest 3 companies have a market share of over 50%. However, many smaller scale companies still exist to concurrent with the large companies.

Customers and certified sustainable beef

As you represent civil society, do you think consumers are sensitive to sustainable beef labels?

I can’t answer this for Brazil.

Align interests of the beef supply chain

What can be done to align interests of the different stakeholders of the beef supply chain?

Our experience shows, that talking and listening is the most important asset, if one can agree on common ground what to discuss.
The interests are naturally different, but can be aligned under a joint common goal, such as beef free of deforestation.

As important is to find out where can be the common interests, and put them forward, not concentrating first on the differences, which always will exist. However, the latter needs to be dealt with too, to not be blind from existing big problems to resolve any given problem.

**Is the law an incentive towards sustainable beef in Brazil? Have there been recent improvements? What do you think of the Forest Code?**

No, the law doesn’t support the production of sustainable beef. The recent developments in Brazil are dramatic, and show that the country is making a step back on decades in case of environmental protection and the protection of indigenous peoples, which are linked to deforestation and the production of good in former forested lands, such as cattle and soya.

See recent media coverage on Brazil’s political crisis and the massacres on indigenous peoples, such as in Maranhão, originating in land conflicts with farmers.

**Why aren't you a member of the GTPS? What role do you think it should have? Are you aware of all the actions that are coordinated?**

We are not a member of GTPS because the aim of the group is not Zero Deforestation. We don't want to waste time and money in groups serving more the green washing efforts than really try to ban deforestation once and for all.

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**7.10 Interview Mr. Fernando Sampaio Executive Director Strategy PCI (Produzir, Conservar, Incluir), Mato Grosso State, Ex executive director of ABIEC, Ex Director of GTPS**

**What does sustainability mean for you?** We have a lot of debate on that. We think it's about continuous improvement on the efficiency of the use of natural resources, producing more with less. The other question is how to measure levels of sustainability? We developed an indicator guide with the GTPS for producers (actually to all the supply chain) to measure their level of development and see where they stand.

**GTPS**

**What is the role of the GTPS?** Let me give you a bit of historical background. During a long time, livestock production increased because of land expansion. It was the time when Brasilia was constructed and the policy of the Brazilian
government was to occupy the whole territory. In the 60's and 70's, there were lots of improvements in the production technology. Cattle was the most important activity, it was almost present in every village. Today the first thing you see after deforestation is pasture; associations are made between deforestation and the beef industry. The industry was growing especially in the North and in the West of the country. Brazil became a key player in the international market while improving sanitary conditions. In 2002, Russia became an importing country for Brazilian Beef, followed by the Middle East, China and Hong Kong. In 2004 Brazil was already the biggest beef exporting country in the world. In 2009, the Greenpeace report held major brands (buyers of leather and beef from the exporting industries present in the Amazon region, McDonalds was not included) responsible for deforestation. In 2007, GTPS was built like other commodities roundtables. It gathered different stakeholders and was in charge of defining guidelines on social and environmental criteria. But majority of producers would struggle to comply to get certified products so certification was not the main issue. Hence the role of the GTPS was changed to disseminate good practices and have a major role in continuous improvement. There are different sustainable projects in different states in different states and they all show that it is good business for farmers and the industry. It is still the big place for sustainable beef discussion in Brazil.

**Who has the most influence over the supply chain?** In the point of view of improvement, the retailers and the industrials are imposing a lot on the producers. It’s a top-down process. There are lots of challenges for producers: access to credit, technology, capacity building and farm management systems. Investment and technical assistance are the kind of solution we want to find as GTPS. A small part of producers are very efficient in terms of pasture management and genetics for instance so they make the money. We estimate that they are around 150,000. Another 350,000 producers are operating in line of financial profit but if they don’t improve, they will have to quit the activity. One million of farmers is already loosing money. Pasture is degrading so they have fewer animals and less money. Some are renting their lands to agriculture farms but not all the areas are suitable to agriculture. Some have a compliance problem with the Forest Code. Anyway the price is always set by the more efficient.

**Do the banks have a role to play with a strict loan policy?** Brazil has enough rural credit with the ABC plan. However, the credit is not going where necessary. Credit should be concentrated in regions in which we want to intensify production. We need to create new product lines such as financing reforestation. Rates are too high at the moment. To get a return on investment, you need at least ten years so credit rates should be more adapted to cattle production.

**Do you think there is a monopoly of slaughterhouses?** Concentration of slaughterhouses is not a problem in Brazil; the market is more concentrated in Canada or in the United States for instance. The real problem is the different levels of compliance from a big exporter to a small one. If JBS is not buying a cattle coming from a deforested area, a small producer could buy it. In some regions, the farms only have one retailer to sell it to. It is the same principle for
What are the current projects? The major project we have is to organize training on technical systems, guidelines and tools. The principle is to train the trainers on how to work on continuous improvement.

ABIEM

Is there a price premium for sustainable beef products? 20% of our production is exported to countries such as China, Russia and Saudi Arabia. The kind of consumer we have today is sensible to cheap products. No one is ready to pay the price; this is why certification is not a solution. At the same time some initiatives are working. A niche market is getting an extra price. This works better when there is cooperation in the value chain. The Rainforest Alliance certification is the result of a partnership between Grupo JD, Marfrig and Carrefour. This example is not a solution given the scale problem that you have. Brazilian customers are not sensible to sustainability. Beef consumption has been decreasing in Brazil in recent years just because of economic reasons.

What is the role of ABIEC? In ABIEC, there were discussions in 2009 about the industry controlling the supply chain. The only tool when buying cattle was the list of illegal sites available on the IBAMA website. Greenpeace stated there were many areas IBAMA could not control. The industry was guilty but could not know. GTPS followed a strategy of continuous improvement while Greenpeace negotiated zero deforestation agreement with the biggest players. MPF signed an agreement that made slaughterhouses buy cattle only from CAR registered properties but no one had the information available. ABIEM started mapping all the farms and crossed this mapping with external information. All the agreements made the industry pay for a job the government was not doing. Today, all parties have information from their direct suppliers. The exporting industry now has control over the beef they export. The challenge is to extend it to all the industry.

Governor de Mato Grosso

Can you elaborate on the main initiatives you took concerning sustainable beef at a federal level? We are talking about the global environment in Brazil so the idea of controlling only one supply chain will not solve the problem. The real question is: how can you combine everything to have a sustainable region? After the climate conference in Paris, the government of Mato Grosso started the PCI program (Produzir, Conservar, Incluir). On these 3 axis, we have set goals for 2030. Among those goals, on the Production side we want to reach 2,5 millions ha of restored pastures and expand crop area over degraded pasture. On the conservation side, we want to implement the Forest Code, preserve 60% of Mato
Grosso original land and end illegal deforestation. Concerning the inclusive aspect, we want the inclusion of family farming and to give technical assistance to family farmers. I am currently working on a strategic plan to make the overall strategy move forward. I am working for a coalition with government, private sector, civil society and people representing farmers. Many of our local goals are aligned with the Brazilian global ambition.

**How do you collaborate with public entities at a municipal level?** The program *Municipios Sustentables* encourages municipalities to adopt their own deforestation targets.

**Is the law an incentive towards sustainable beef in Brazil? Have there been recent improvements? What do you think of the Forest Code?** Brazil is one of the few countries in which the agricultural sector has such importance. We are selling commodities associated with the implementation of a Forest Code. We have to give some value to what has been done in Brazil. It’s a lot already and it’s very heavy on the producers. The idea of Mato Grosso is the following: if I can achieve my PIC, if the forest is restored and if the environment is preserved, I can create a jurisdiction that is safe for all companies to supply in the region.

**Align interests of the beef supply chain**

**What can be done to align interests of the different stakeholders of the beef supply chain?** Brazil can become a model in sustainable development if we can implement a production model with the Forest Code. The interests of the supply chain should be transposed in a trade agenda. GTPS is the adequate forum to discuss hits, with lots of actions and projects under its umbrella.

**How can you measure levels sustainable development? Is it mandatory to create new tools?** What has been done today is crazy: repeating monitoring systems. It would be cheaper for everyone if the information could be shared. There is no reason why supermarkets should monitor farms. The slaughterhouses should do that. Information should be shared on both sides: where the meat is going to and where it comes from. Consumer feedback is very important, a map of quality should be drawn according to consumer feelings. In the last 15 years, the area occupied by livestock has reduced. The future expansion of agriculture can be done on the same pastures. The existing pastures are enough for agricultural expansion and for the implementation of the Forest Code.