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Leveraging Agricultural Value Chains to Enhance  
Tropical Tree Cover and Slow Deforestation

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# Beef in the Brazilian Amazon

João Shimada and Daniel Nepstad



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1818 H Street NW

Washington DC 20433

Telephone: 202-473-1000

Internet: [www.worldbank.org](http://www.worldbank.org)

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## **Executive Summary**

Pasture is a major driver of land-use change throughout Latin America. This is especially true in the Brazilian Amazon, where 70% of deforested land is under pasture. Here we examine the Brazilian Cattle Agreement (BCA), the world's most ambitious effort to slow tropical deforestation associated with pasture expansion. The case study of the BCA is an important illustration of both the promise and limitations of value chain approaches to curbing tropical deforestation.

### *The Brazilian Beef Market*

Market demand for sustainably-produced beef in Brazil is low. Eighty percent of the beef produced in Brazil is destined for domestic markets where consumers have not yet made the sustainability of the beef production system a purchasing priority. However, some supermarket chains are moving in that direction. (ABIEC 2017) Meanwhile, export markets are dominated by China and other emerging economies that have yet to embrace sustainability as a sourcing requirement or preference.

### *What is the BCA?*

The BCA is a commitment that was made in 2009 by the four largest beef processors in Brazil: Bertin, JBS, Marfrig, and Minerva. Together these companies are responsible for 50% to 80% of beef processing in the Brazilian Amazon. The BCA aims to make the beef supply chain more sustainable by excluding ranchers who engage in deforestation, forced labor, and encroachment on indigenous and protected areas in the Amazon biome. The BCA is often mentioned and compared with the Brazilian Soy Moratorium (BSM), as both are commodity agreements inspired by awareness campaigns led by environmental non-profits, in this case Greenpeace and Amigos da Terra-Brazil (Greenpeace International 2009a, 2009b; Amigos da Terra – Amazonia Brasileira 2008, 2013). However, unlike the Soy Moratorium, an important impetus for the BCA was the legal action taken by the Federal Prosecutors office (*Ministério Público Federal*) of Pará state, which forced processing plants to no longer buy cattle from ranches that were not in legal compliance. The BCA successfully functioned for eight years. However, in 2017 the largest processor, JBS, had two of its plants closed due to illegal purchasing. Ranches that engaged in illegal deforestation and that had cattle sale embargoes for other legal infractions were found to be present in JBS's supply chain. Both of these actions were violations of the BCA. Following the scandal, Greenpeace pulled out of the agreement, although the BCA continues.

### *Has the BCA worked?*

As with the Brazilian Soy Moratorium, the success of the BCA depends upon the perspective. From the perspective of corporate risk management, the BCA was an important step forward. Signatory companies reported 99 to 100% compliance with BCA in 2017 (JBS 2017; Marfrig 2017; Minerva 2017). Taken at face value, these statistics are encouraging and may mean that an improvement in cattle-linked deforestation is underway. However, there is need for more transparency and traceability in the supply chain so that these numbers can be verified, and compliance can be monitored. Furthermore, the BCA's most meaningful effects have so far been confined to cattle finishing ranches that sell directly to meat processors. Their proximity to the end of the supply chain makes these operations easier to trace, though finishing ranches only represent around 20% of Brazilian Amazon ranch area. In contrast, the agreement has had limited influence on breeding and fattening operations, whose complicated networks pose obstacles to traceability.

From the perspective of regional deforestation, the BCA, like the BSM, has made a positive, if modest, contribution to the approximate 70% decline in deforestation, reinforcing the large number of policies and programs put in place by the Brazilian Government that are reviewed in the LEAVES Soy Case Study.

Like the BSM, the BCA uses a private, voluntary agreement to address gaps in public policy. However, the BCA also capitalizes on an important opportunity to reinforce the Brazilian government's command-and-control measures to slow deforestation by requiring ranch properties in the supply chain to be part of the government's rural registry.

#### Has the BCA caused leakage?

Cattle production continued to climb after the BCA was established, both through expanding pasture area and increasing cattle yields. These increases make leakage issues unlikely. Evidence of cattle laundering, in which cattle raised on non-compliant ranches are moved to compliant ranches to be sold to meat processors, was found.

#### The Way Forward

In December of 2015 the state of Mato Grosso launched the Produce, Conserve and Include (PCI) Strategy, a set of state-wide targets for 2030 developed through multi-sector dialogue and consensus. (PCI 2017) The PCI defines and quantifies a future vision that, if successful, would keep six billion tons of Carbon di Oxide equivalent (CO<sub>2</sub>eq) out of the atmosphere. The plan aims to increase soy and beef production while achieving state-wide zero net deforestation. This will be accomplished through partnerships with the state's 43 indigenous groups and through the provision of technical assistance to more than 100,000 smallholder farmers. PCI provides a jurisdictional context and a connection to government policies that can address the weaknesses of value chain approaches to deforestation such as the BCA.

#### Key Insights and Questions

Despite the impressive decline in deforestation in the Brazilian Amazon through years of government and private sector efforts, the deforestation problem is far from being solved. In fact, deforestation rates in the Brazilian Amazon are rising since 2012.

Some of the key lessons from the BCA are:

- Missing carrots: As is the case with most corporate zero-deforestation pledge approaches, there is a need for positive producer incentives. By excluding all deforesters from the supply chain instead of targeting illegal deforesters, the agreement ends up penalizing those conservation-minded, law-abiding producers who have retained more forest on their land than is required by the Brazilian Forest Code.
- Traceability and monitoring problems remain unresolved: The impressive supply chain monitoring systems developed by JBS and Marfrig do not monitor breeding and all fattening operations, because these steps in the supply chain do not sell cattle directly to meat processors. The systems in place currently do not allow public access nor do they exhibit enough transparency. A new approach, called VISIPEC<sup>1</sup>, could potentially fill this gap.
- Land grabbing: The cattle agreement does not address the deforestation that is driven by land grabbing, where the presence of cattle pastures is used to demonstrate to the land titling agency that the land is under productive use. The agreements also fail to address cattle operations that sell to clandestine meat processors.
- Missing governmental case: Many sustainable supply chain initiatives operate under the assumption that governments are not reliable partners in striving for sustainable development. These initiatives are implemented with little concern for how the zero-deforestation agenda will harmonize with public policies in the production region. A common piece of commentary we have heard from those who work with sustainable supply chain initiatives is that working

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<sup>1</sup> VISIPEC is an online platform developed by Gibbs Laboratory in University of Minnesota, that enables crosschecking beef production flow.

with both the government and the farm sector is slow going, and it has not led to sufficiently ambitious targets. However, we also need to consider how any progress made can be sustainable in the long run if it is disconnected from public policies?

*Possible Role of World Bank Group (WBG)*

The provision of finance is vital to the production and trade of commodities. As a multilateral finance institution, the World Bank Group can influence ways to collectively direct capital towards environmentally and socially sustainable production models.

- The World Bank Group can encourage the governments it works with to develop and adopt operational property boundary maps, reliable mapping and dissemination of annual deforestation polygons, and legal mechanisms for forcing processing plants to impose requirements on their suppliers.
- For farmers in the WBG's private sector loans to processing plants, such as the aborted loan that was under development for the Bertin plant in the south-eastern Pará, one point of negotiation can be the companies' commercial relationship with suppliers. In Brazil, cattle producers hold deep resentment of processors because of inaccurate balances and lack of payment for hides and drop.
- The lack of access to appropriate forms of finance is cited by many producers as one of the barriers they face to their transition to a more sustainable production system. The provision of finance may not be straightforward, and may require the creation of new finance mechanisms. This effort to finance the transition is crucial to meet the scale.

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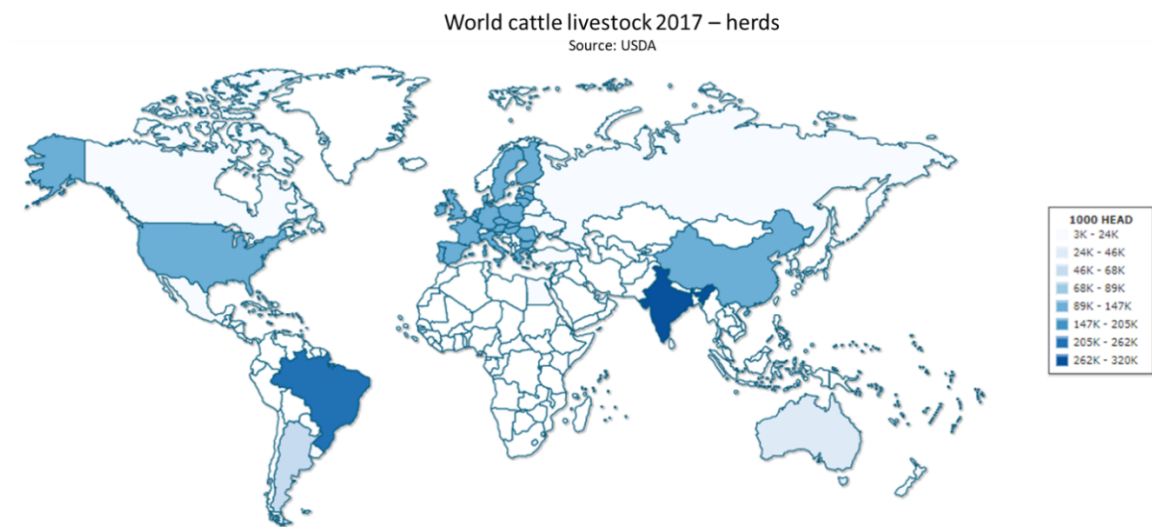
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## 1. Introduction

Population growth, rising incomes, and urbanization have created unprecedented global demand for high-value animal protein. Meanwhile, the world's livestock sector is expanding at record rates to keep pace, supported by favorable macro-economic climates in the emerging economies of Asia and elsewhere. (Figure 1)

For the beef sector, the past can often be the best indicator when it comes to quantifying future markets. While industry uncertainties exist—including disease outbreaks that have repeatedly impacted producer income and recent unpredictable trade flows—the impacts have generally been short-lived and consumption patterns have been able to rebound quickly.

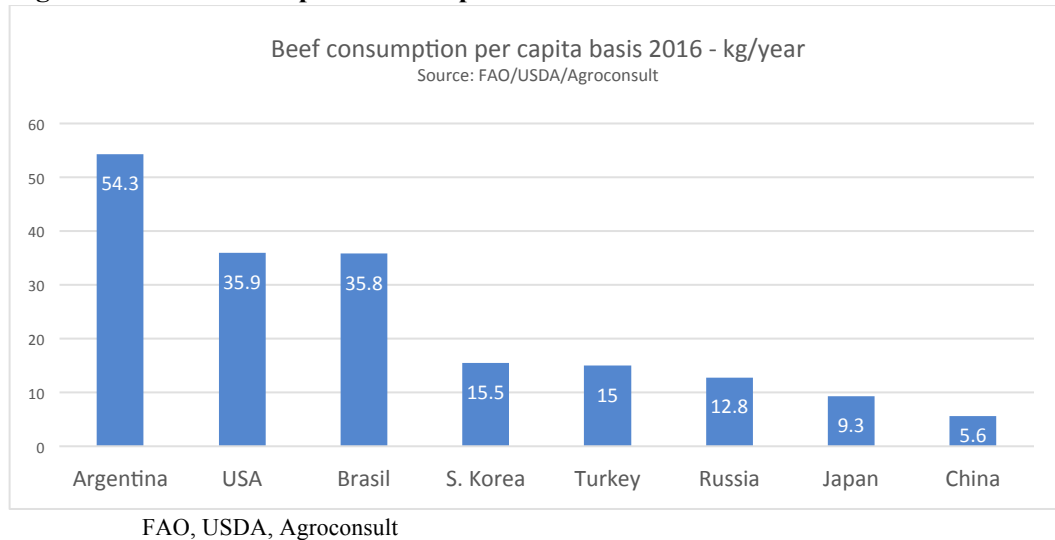
**Figure 1: Map of National Cattle Herd Sizes in 2017**



Source: Index Mundi 2017, USDA

In general, income levels are positively correlated with animal protein consumption rates (Byerlee, Falcon, Naylor 2017). Over the past 25 years, Brazil and China have seen their per capita animal-protein consumption rates more than double. Despite this growth, Asian per capita consumption is still relatively low when compared to most developed nations in the world. (Figure 2) This implies that significant growth potential still remains for the beef sector in Asia and especially in China.

**Figure 2: Beef Consumption Per Capita in Selected Countries in 2016**



Brazil has the world's largest commercial cattle herd and is the largest exporter of beef in weight and value, trading around 20% of this production. The Brazilian per capita beef consumption has remained flat over the last years at about 36 kg/year. At same time the country still has productivity levels below the main world beef producers such as USA, EU, Australia, and Uruguay. Because of this potential for vertical expansion in the cattle ranching, the Brazilian beef is well positioned to maintain its dominance in export markets (Soares-Filho et al. 2015).

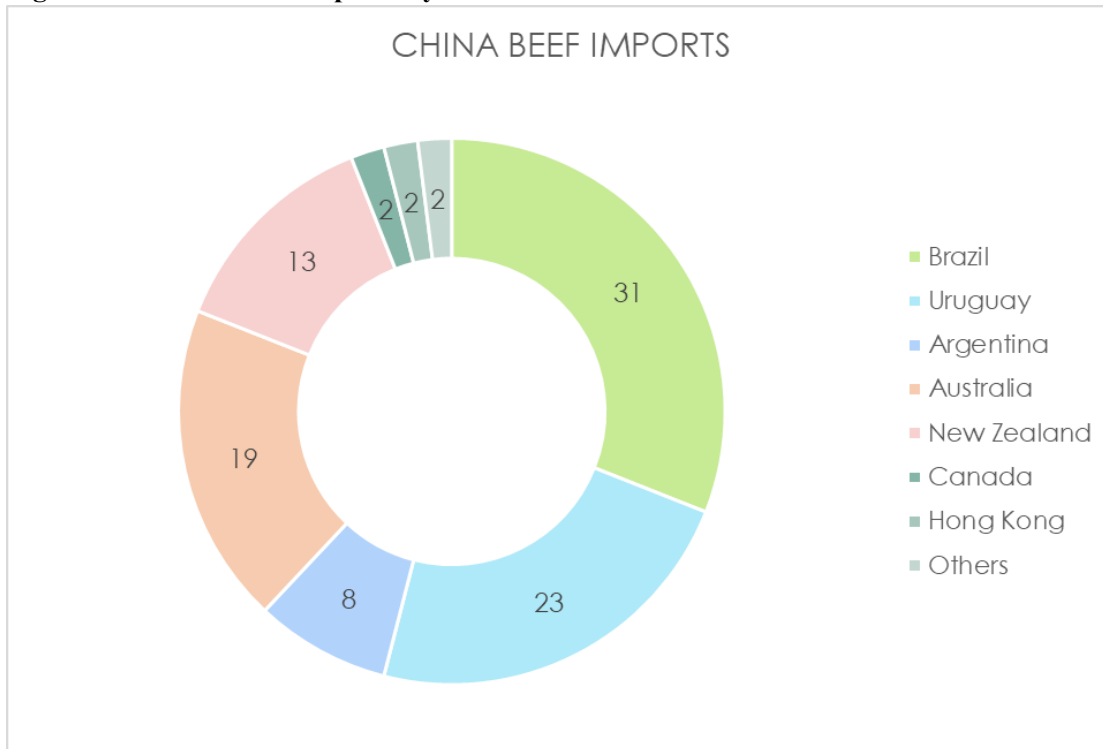
Over the last few decades, China has systematically shifted from a self-sufficient food directive to a food security policy that relies on agricultural commodity imports and exerts maximum control over the production regions that supply these imports. This can be seen in the rapid internationalization of Chinese companies that has taken place in recent years as well as in strategic investments aimed at controlling key supply chains. The latter strategy is especially remarkable regarding the country's mounting influence on the global soy sector, which has served as a way to manage China's dependence on outsourcing agricultural products for internal food security (Guoqian, Hongzhou 2014).

This new Chinese public policy approach stemmed from a combination of limited potential for growth in agricultural expansion domestically, pressing environmental challenges such as pollution, and a rapidly growing middle class, which is currently estimated to be more than 300 million and is expected to grow to 620 million by 2022. Together these factors illustrate the likelihood of a future trajectory for beef product demand that continues to increase at accelerated rates (Guo et al. 2008).

Chinese beef demand is expected to increase by an additional 2.2 million tons Carcass Equivalent Weight (CEW) per year through 2025. Competitive pricing has drastically shifted market shares into South American beef production. China has begun to increasingly rely on a few select countries for sourcing, primarily Brazil, Uruguay, and Argentina. In 2016, beef imports from South America represented approximately two-thirds of China's total beef imports with Brazil accounting for the largest share. (Figure 3)



**Figure 3: Chinese Beef Imports by Market Share**

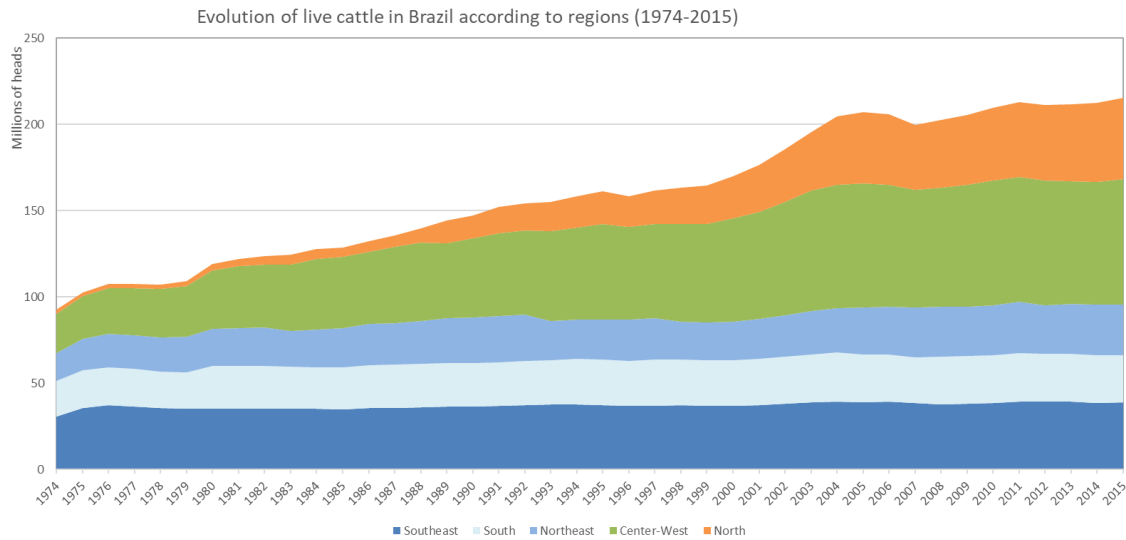


Source: USDA 2017

Globally, China is also the top importer and processor of leather, the second most profitable cattle product after beef (Walker et al. 2013). Although the demand for leather is often seen as a function of demand for beef, leather enjoys its own market dynamic; it plays a prominent role in the Chinese manufacturing sector. In 2017, 32.1% of Brazilian leather exports (US\$1.9 billion) went to China and Hong Kong. While only about 19% of beef is exported, this figure rises to 74% for leather (ABIEC 2017; Walker et al. 2013).

In response to the growing international demand for animal products, the Brazilian cattle herd grew by approximately 50% from 1990 to 2016, or from 147 to 219 million heads (ABIEC 2017). Eighty percent of this increase occurred in Brazil's Amazon and Cerrado tropical zones. (Figure 4)

**Figure 4: Brazilian Cattle Herd Evolution by Region**



Source: IBGE

## 2. Background

### Frontiers

Throughout history, frontiers have attracted large numbers of people looking to leverage land-acquisition opportunities into social mobility and income security. For most countries in the developed world, frontier settlement has served as an important economic phase early on in their development trajectories. However, in Brazil, this process has occurred relatively recently and is still taking place in some parts of the Amazon (Schielein, Börner 2018).

For example, most of the producers now living in Mato Grosso arrived in the region—or are descendants of those who arrived in the region—as sharecroppers or smallholder farmers from the south of Brazil, who were drawn by the promise of free or cheap land despite the region’s lack of infrastructure or proven suitability for crop production (Rausch 2014). Now the land they claimed has been transformed into a powerful social and economic development mechanism, enabling them to produce in one of the most productive agricultural areas in the country with growing opportunity to participate in lucrative global export markets.

However, the process of frontier settlement in Brazil has lacked long-term planning and has faced ineffective governance that failed to prioritize important political and economic values. Therefore, when the expansion of the agriculture frontier into the Amazon took place, it came at enormous environmental and social costs. The good news is that because this process was so recent, and nearly 80% of the Amazon forest is still standing, there are still opportunities to manage the process to include environmental and social components into the development equation.

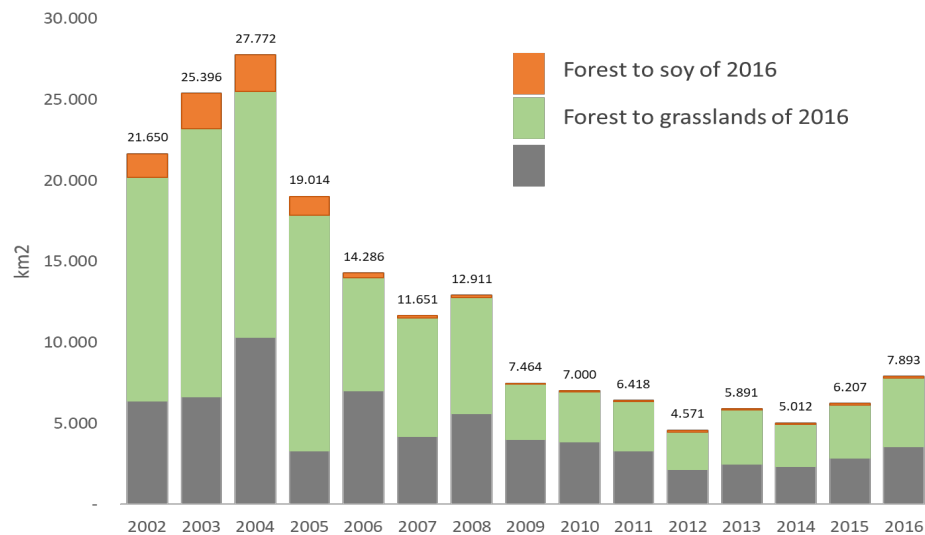
### Cattle ranching

Cattle ranching is the land use that occupies the largest area in Brazil, covering around 165 million hectares (ABIEC 2017). However, cattle ranchers achieve lower net incomes per land area than producers of grain, sugarcane, or cotton crops (Margulis 2004). This reality is likely contributing to a decline in the area of cattle pasture in regions outside of the Amazon.

Cattle ranching has historically served as the primary land-use activity in recent converted areas in the

Amazon due to a combination of rusticity and economic feasibility—low upfront investment requirements, few inputs, and simple logistics. EII estimates that roughly 70% of deforested area in Amazon biome over the last 15 years are now occupied by cattle pastures. (Figure 5)

**Figure 5: Total Annual Deforestation in the Brazilian Amazon Region and Allocation of Newly Cleared Land by Use—Soy Cultivation, Livestock Grazing, and Other**



Estimations by Earth Innovation Institute using spatially explicit data from Prodes, TerraClass, LAPIG and IBGE Brazil  
 Grassland areas projected for 2014-2016  
 Figures on soy 2012 onwards by AgroSatelite and Soy Moratorium report

Source: EII

While areas outside the Amazon are seeing pasture area decline, the Amazon Mato Grosso and Pará states represent hotspots of expansion. Currently the two states account for 63% of slaughter in the greater Amazon region.

The Amazon cattle herd in Brazil is slaughtered at a faster rate than elsewhere in Brazil, and is maintained on properties that are much larger, on average, than outside of the Amazon. (Figure 6)

**Figure 6: Characteristics of the Cattle Industry in the Brazilian Amazon Compared to the Rest of Brazil**



Source: ABIEC, 2016; MAPA, 2017

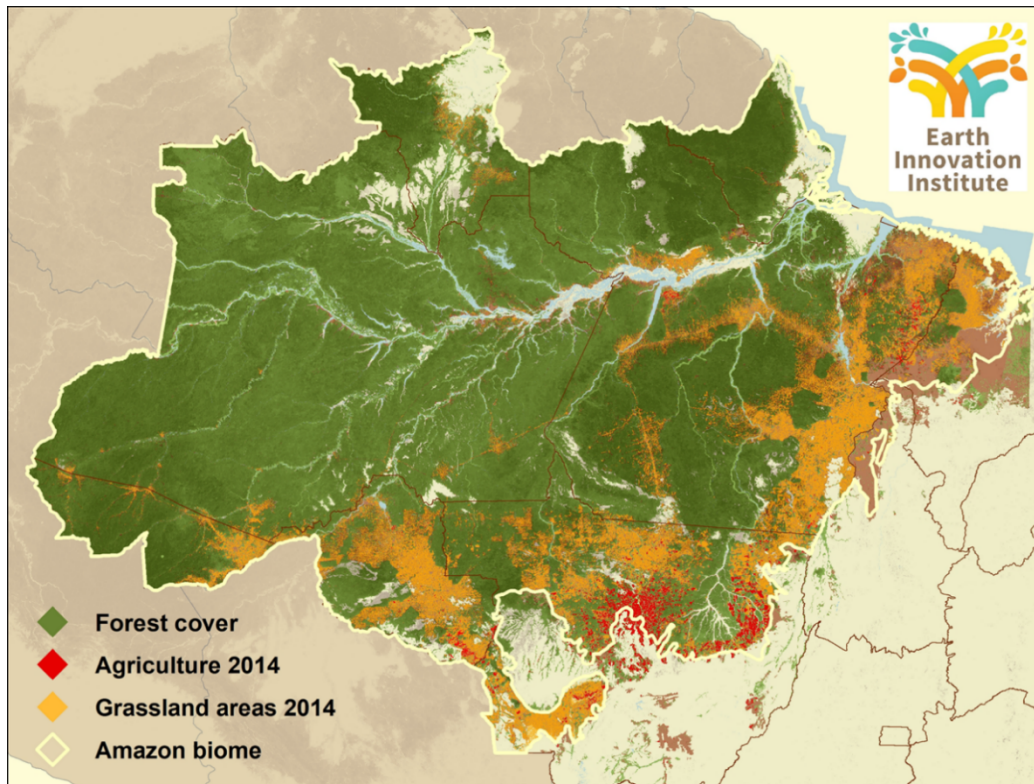
Source: ABIEC 2017, MAPA 2017

For many years, Mato Grosso had the highest rates of deforestation among Brazilian states in the Amazon. In 2004, it reached 11.8 thousand square kilometers, 40% of total Brazilian Amazon deforestation that year. (Figure 5) Agricultural and livestock activities are the main economic activity in the state and occupy 35 million hectares (39% of total state area), making it the largest grain and

beef producer in Brazil.

The 24 million hectares of Mato Grosso pastures currently sustain 30.3 million head of cattle, which is 14% of the national herd. Fifty nine percent of the state's herd is in the Amazon municipalities (ABIEC 2017; SEMA-MT 2010). The beef processing industries receive 4.9 million head per year, representing 19% of the national slaughter (MAPA 2017).

**Figure 7: Forest Cover, Agriculture, and Cattle Pasture (“Grassland”) in the Brazilian Amazon Biome**



Source: EII

### Zero Deforestation

There is enough cleared land in the Amazon to sustain an expansion of crop production well into the future. There is also available technology to intensify cattle production on current lands, where it can meet growing demand without the need for new deforestation. If this is true, then why is deforestation still taking place (Strassburg et al. 2014)?

First, the end of deforestation in the Brazilian Amazon region means going beyond what is legally required for compliance with the Forest Code, and is subject to the personal decisions of land owners (Nepstad et al. 2009). From their perspective, the 80% compulsory forest conservation requirement established through the Forest Code is already a daunting task to achieve (Stickler et al. 2013). Not only is the Forest Code a major challenge with which to comply, but there is also a lack of positive incentives for farmers who waive their rights to legally clear forests.

Second, the end of deforestation in the Amazon region represents near-term economic losses for the Brazilian economy. A recent study conducted by Instituto Escolhas in partnership with University of São Paulo (USP) calculated the economic impact of zero deforestation on the national GDP to be - 0.6%, or US\$14 billion by 2030. (Leitão, Vasconcellos 2017) However, this GDP decrease would not be allocated evenly across the country. The biggest impact would take place in the frontier areas and

would affect low income populations the most. The largest decrease, 3.17% in gross domestic product (GDP), would take place in Mato Grosso. This value considers opportunity costs and the difference between forest-land value and crop-land value. For the Brazilian Amazon, the opportunity cost of halting Amazon deforestation today has been estimated at approximately US\$250 billion just taking into consideration lost future profits from cattle and soybean production (Nepstad et al. 2009).

Unfortunately, the positive impacts from ending deforestation—such as climate change mitigation, rainfall stabilization, and biodiversity preservation—were not measured in the Instituto Escolhas calculation. Generally, environmental services do not yet have functioning markets, and in economics it is difficult to estimate costs without price information. For example, the forest carbon in a typical hectare of Amazon forest alone would cause damages to the global economy if released into the atmosphere, but the value of forest land is lower than the value of cleared land (Nepstad 2018a).

Seen from another angle, endorsement of a zero deforestation goal by a local politician in the Amazon region is generally not an effective way to win votes as most voters still view deforestation as a necessary step to achieve economic development (Nepstad 2018a). For example, of Brazil's municipalities with the worst Human Development Index (HDI) values (below 0.499), 56% are in the Amazonian states where forest cover is much higher than elsewhere in Brazil. (PNUD 2010) However, there are no agribusiness municipalities on this list. The quality of life in the Brazilian northeast arid zone, known for its poverty, is generally assessed higher than in the Brazilian Amazon.

Predatory development models are also not contributing to sustainability. The boom and bust economic cycle occurs when economic activity is temporary such as with timber extraction, gold mining, and extensive cattle ranching that is driven primarily by land grabbing. This model is common and can result in further conflict and violence that exacerbate the negative impacts already associated with the strategy (Schmink, Wood 1992).

Mato Grosso and the Brazilian Amazon more generally have a dynamic land use occupancy pattern that is typical for frontier settings. Changes and adjustments happen quickly and usually with inadequate planning. The mechanisms aiming to establish governance and build a sustainable development model must be thoughtfully applied on a scale large enough to result in changes to this dynamic.

### **3. Public Policies and Programs**

#### **3.1 Introduction**

Brazil is one of the world's leaders in environmental policies and achievements. It has created one of the highest levels of formal forest protection and more than half of the Amazon forest biome is protected by recognition and demarcation of indigenous peoples' territories. It is the only major tropical forest nation to greatly slow tropical deforestation, even when most of its forests are still standing (Soares-Filho et al. 2010; Nepstad et al. 2014). Brazil's success in slowing Amazon deforestation means that it is a global leader in climate change mitigation. These accomplishments are particularly notable since Brazil is also the nation that has seen the greatest increase in food commodity production and export.

Brazil's success in slowing Amazon deforestation can be traced to its innovations in public policies, programs, and value chain initiatives. It is one of the world's great laboratories for reconciling tropical forest conservation and rapid increases in livestock and agricultural production, with Mato Grosso as perhaps the biggest source and incubator of these innovations. In general, the approaches that have

been developed for slowing deforestation in Brazil, especially in the Amazon forest biome, are punitive and restrictive—heavy on sticks and light on carrots.

Of particular importance for the forest conservation agenda is the Brazilian Forest Code, which we review here. We then provide a brief summary of some of the other main public policies for slowing tropical deforestation.

### **3.2 The Brazilian Forest Code**

Brazil has set a higher forest conservation bar for its farm sector than any other nation through the Brazilian Forest Code (BFC), which is also the source of ongoing tensions between this sector and environmental groups. The BFC is the world's most ambitious regulation for forest conservation on private property. In the Legal Amazon, landholders are required to maintain 80% of their land in forest in the Amazon forest biome or 35% in the Cerrado. Outside of the Legal Amazon, 20% of each property must remain as native woodland/savanna cover. This legal reserve requirement is above and beyond the other requirements of the BFC including the mandatory conservation of native vegetation in riparian zones, steep slopes, and hilltops (Stickler et al. 2013; Soares-Filho et al. 2015).

The BFC is an essential piece of the tropical forest conservation agenda in Brazil because of its prominent influence over the land-use decisions that are available to landholders, over the value of rural properties that result from those decisions, and over the widespread perception among Brazilian farmers that they are held to a different standard than their counterparts in the US or Europe.

And like so many well-intended government regulations imposed on landholders across vast and unruly frontier regions, the Forest Code was for many years not taken seriously by either government agencies or farmers. When the government developed the political will, the inter-agency coordination, and the tools, both legal and technological, to implement the BFC in 2004, a new phase in the tropical forest conservation agenda began (Nepstad et al. 2014).

Many of the sustainability initiatives that have been put into practice in the Brazilian Amazon feature standards or rules that include legal compliance. An important assumption behind the inclusion of legal compliance in sustainability initiatives is potentially misleading. This assumption is that legal compliance is the choice of the landholder alone. In fact, legal compliance is a reflection of a larger system that is established by public agencies. Legal compliance depends on a fair application of the regulation, with clear and decisive consequences for non-compliance. As seen in experiences around the world, the ultimate longevity and effectiveness of land-use regulations is that they work best when there is a blend of positive and negative incentives (Cattaneo et al 2006).

The BFC includes provisions for the eventual creation of positive incentives for legal compliance. Article 41 of the New Forest Code provides the legal framework for the establishment of systems for compensating the conservation and restoration of ecosystem services. However, it has yet to be implemented.

In the absence of positive incentives, we are left with command-and-control—hard limits on what landholders can do with the forests on their land that are enforced by the government. Jair Schmitt has assessed compliance with the Brazilian Forest Code based on the economic theory of crime. A property owner's decision to deforest illegally is the result of two opposing considerations: economic advantage and punishment risk (deterrence value). For cattle ranching in the Brazilian Amazon, the economic advantage value was calculated to be R\$3,000, while the deterrence value was R\$ 38.54. This low deterrence effect illustrates the tremendous advantage of illegal deforestation and the low effectiveness of legal enforcement's capacity to govern (Schmitt 2015).

In Mato Grosso, 96% of Amazonian deforestation is illegal, yet Schmitt's study shows that only 24%

of the state's deforestation has met with punitive measures, and only 18% of deforestation events have led to the inclusion of a property in the Brazilian Institute of the Environment and Renewable Natural Resources (IBAMA's) embargo blacklist (SEMA 2010). Finally, only 0.2% of the total amount of issued fines for illegal deforestation were effectively paid.

### **3.3 Public Policies and Programs**

Some of the other public policies that are relevant to forest conservation and agricultural production are summarized here with further description reviewed in Nepstad et al (2014):

- National Plan for Climate Change (PNMC): Created in 2008, the PNMC is designed to promote the rise in renewable energy, to increase use of biofuels, to reduce deforestation, to shift to low-carbon agriculture, and to expand planted forests.
- Deforestation Prevention and Control Plan (PPCDAM e PPCERRADO): PPCDAM was created in 2004 to reduce deforestation rates in the Legal Amazon and to support state-level strategies to control deforestation. PPCERRADO was created in 2009 with the same goals for the Cerrado. The 4<sup>th</sup> phase of PPCDAM was launched in 2015 during the COP21 in Paris and sets a target of reducing deforestation 80% by 2020 and achieving zero illegal deforestation by 2030. The PPCDAM is reviewed in the LEAVES Soy report.
- Program for Amazon Protected Areas (ARPA): This program creates a target to set aside 60 million hectares of protected areas. ARPA is considered the largest program of its kind in the world and in 2015 had already reached 58.3 million hectares in 105 protected areas.

## **4. Sustainability Initiatives**

### **4.1 Value Chain Approaches**

As a result of the process of globalization that began around 2000, the driving forces of deforestation in the Brazilian Amazon have shifted to increasingly include international markets for agricultural commodities and the factors that determine Brazilian participation in these markets. The international prices of agricultural commodities (especially soy and beef), exchange rates, and the eradication of foot and mouth disease have all served as market indicators that are strongly associated with the pace of deforestation in the Brazilian Amazon (Byerlee 2017; Nepstad et al. 2006).

As market influence became an increasingly important driver of deforestation, an opportunity emerged to use these market forces to complement and reinforce public policies. By aligning private supply chain initiatives with the creation of protected areas, the property licensing process, the ecological-economic zoning plan, and forestry management, the hope was that the resulting synergy would work to promote strong governance on the frontier.

We briefly review the most relevant value chain initiatives here. In general, a wave of progress in establishing international sustainability standards for certified, sustainable commodities through multi-stakeholder dialogues began in the 90s and continues today. More recent innovations include corporate zero-deforestation pledges and their implementation, sector-wide agreements such as the Brazilian Cattle Agreement, and farmer-focused strategies such as the Sustainable Livestock Working Group of Brazil (GTPS).

### **4.2 Sustainability Certification**

In an article published by Mongabay in 2017, the author Mike Gaworeckin reports that in early 2017 the Sustainable Agriculture Network (SAN) decided to discontinue its work with agriculture certification. André de Freitas, executive director of the SAN, stated: "After working with this tool for over 20 years, we can look back and conclude that certification was not the best approach to improve the sustainability of most farmers in the world, especially when considering the huge challenges we

face from climate change, poverty, deforestation, soil and water contamination, and human rights violations. In our history, we have seen many positive impacts from certification for workers, producers, and the environment. But, we have also increasingly come to recognize the limitations of certification as a tool to drive change in agricultural production systems at scale.” (Gaworeckin 2017).

Certification schemes face the challenge of striking a balance between 1) setting a high bar that would result in meaningful outcomes, but that would be difficult for farmers to achieve, and 2) setting a low bar that is more feasible for farmers to achieve, but that would result in less impact. It is typical in the beginning of the certification process for things to move slowly. This was the case for producers seeking the SAN certification, who faced difficulty expanding their product supply to keep pace with demand. At one point there was only one certified farm in Brazil, and it did not have enough supply to meet the demand of the large companies interested in sustainable products. By September of 2016, cattle ranch certification of SAN had made little progress. Only five Brazilian ranches achieved certification, making up less than 0.01% or 16,000 hectares of national pastureland.

Ultimately the market was not able to consistently buy certified beef for a premium price domestically or globally. Consequently, beef industry players could not commit to giving cattle ranchers premium prices for their products. Certification comes with a clear economic cost to the farmer, manifested predominantly as audit fees and on-farm adjustments. Offsetting this cost depends on producers being able to add enough market value to their product to warrant higher price premiums. However, if there is little or unreliable demand for sustainable product, this added value becomes uncertain, resulting in a high amount of risk for producer investment.

The need to increase consumer demand for sustainable products and the incentives for certification to motivate the producers is also the conclusion of Alves-Pinto et al. (2013), who also propose a pathway for scaling up interventions to achieve a large-scale shift to sustainable production practices across the cattle supply chain.

De Freitas discusses four main interrelated limitations of certifications in agriculture:

- Complexity: He argues that certification standards are too complex for most farmers, who often lack the technical and financial resources necessary to meet the criteria. This is especially true for smallholder farmers.
- Costs: He states that certification audits are done as a policing exercise, which brings little direct value to the producer.
- Scalability: A lack of scalability is the direct result of complexity and cost associated with low demand. Certification operates, in practice, through a low hanging fruit mechanism and only a small fraction of top-performing farms and ranches can make the cut.
- Effectiveness: He points out that most problems present in major commodity supply chains are not coming from the top performers, but from the bottom half, which is unlikely to participate in voluntary initiatives as long as a market exists for conventional product. Additionally, certification has limited effectiveness in dealing with structural problems such as child labor, poverty, and sanitation.

Credible agriculture certification will continue to play an important role in the fight against deforestation as it has made important contributions to developing sustainable agriculture models that deserve recognition. However, upon close examination it becomes apparent that certification schemes have done little to motivate transitions to sustainability. Instead, farmers and companies that were already reasonably good actors are rewarded, while the bottom half continue business as usual.

## **4.2 The Brazilian Working Group on Sustainable Livestock (GTPS)**



The GTPS includes representatives of nongovernmental organizations (NGOs), the beef industry, financial institutions, producer associations, producers, retailers, and input suppliers. The working group was formalized as an NGO roundtable in 2009, the same year the loan to Bertin was revoked.

Unlike other sustainable-commodity roundtables—such as RTRS, RSPO, or Bonsucro—the GTPS does not aim to set up a standard and create a certification scheme. Because the majority of cattle ranchers are a long way off from legal compliance with the Forest Code, most cattle ranchers are unable to comply with rules that include legal compliance. A certification approach would also run counter to GTPS’ principle of inclusivity and embracing bottom-up solutions.

Rather than creating a certification standard, the GTPS is focused on the creation of a handbook that could help cattle ranchers to improve environmental and social management, to increase their productivity, and to comply with legal requirements. The rationale for this focus is that by helping ranchers to improve their productivity in already cleared areas, the extra income could be channeled to support their compliance with the Forest Code and reduce the need for horizontal expansion.

The GTPS handbook Sustainable Cattle Ranching Indicators Guide is a set of 70 indicators divided into 5 principles and 32 criteria ranked by cost-effectiveness, allowing the producer to start with solutions that are cheap and simple but that can still result in high impact. (GTPS 2016) The Guide can be adopted by ranchers, industry, input suppliers, and retailers. It covers production management, community relationships, labor issues, environmental impacts, and value chain responsibility. It was developed to be a continuous improvement tool. The indicators are organized in five inclusive and cumulative levels from basic to advanced.

In 2012, the GTPS was one of the founding members of the Global Roundtable for Sustainable Beef (GRSB). This new organization was created to support the creation of country-level roundtables to develop guidelines and indicators of sustainability.

#### **4.4 Corporate Zero-deforestation Pledges (CZDPs)**

The successful reduction of deforestation in the Brazilian Amazon over the past decade and the assumption that an important cause of that reduction was the BSM, have generated considerable enthusiasm for corporate zero-deforestation pledges (CZDPs) in recent years. Deforestation pledges have been announced by more than 700 major companies that buy large volumes of high forest risk commodities (Supply Change 2017). Some of the challenges and risks of these pledges are described in a 2016 document by EII entitled Making Corporate Deforestation Pledges Work and summarized here.

For the consumer, the logic behind these pledges seems quite simple; a company announces that it will no longer buy products that are associated with deforestation, then the farmers and businesses that grow and sell commodities to these companies will stop cutting down trees. It follows that if enough companies come forward with these commitments then a complete market transformation could take place, in which deforesters are excluded from the supply chain.

These pledges, if they succeed, could provide important market reinforcement for the many policies and programs established by national and subnational governments to slow deforestation. However, in dynamic agricultural frontiers where rule of law is often weak and land-grabbing is prevalent, the details on how these initiatives will be implemented are essential.

CZDPs may be best viewed as an important tool for reinforcing and complementing the development and implementation of good frontier governance or for development of public policies and programs designed to slow deforestation and foster sustainable development. However, the positive influence of

CZDPs is by no means assured. There are some important risks posed by CZDPs that deserve special consideration:

- The risk of splitting the market: One way for a company to meet its deforestation pledge is by distancing itself from the problem. When companies that are vulnerable to reputational risks pull out of a region, others that are less vulnerable to these risks and less committed to sustainability are ready to step in with less competition. The net effect could be a split market, where responsible companies migrate away from areas of active deforestation.
- The risk of deepening rural food insecurity and poverty: In the face of CZDPs, swidden agriculture can become a liability to the farmer. Communities and farmers who are engaged in swidden agriculture, in which small plots of forest are cleared and burned then planted with crops, may be excluded from a potentially lucrative new form of revenue because they are practicing their traditional food production system.
- The risk of penalizing farmers and farm businesses who are striving to comply with the law: Most companies make their deforestation pledges without specific reference to the laws, public policies, and regulations for forest clearing in the tropical forest regions they buy from. This means that they can end up penalizing the rural actors who are critical proponents of sustainable rural development: the farmers and businesses who are striving to comply with the law.
- The risk of antagonizing governments and farmers in target regions: A CZDP that is announced unilaterally, without discussion with key stakeholders on the ground, can trigger negative reactions from the respective governments, farm sectors, and other members of regional societies.

## **5. The Intensification of Beef Production**

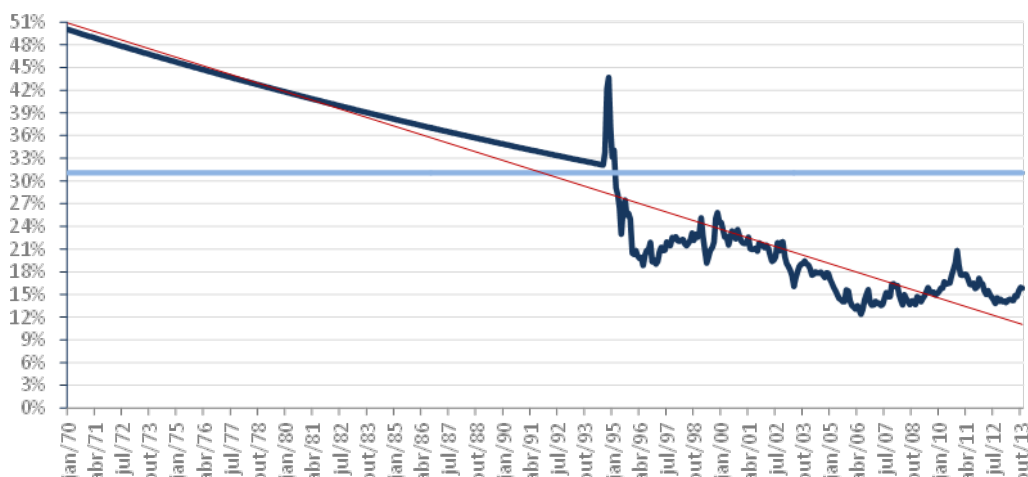
Increasing farms yields also can play an important role in reducing the pressure for new cleared lands. Many studies have already demonstrated that this is technically possible and feasible economically (Strassburg et al. 2014; Nepstad et al. 2014). To achieve a world in which there are both more forests and greater food, fuel and feed production, it will be necessary to increase yields as mechanisms are also established for inhibiting forest conversion.

The productivity of beef production in Brazil rose from 34.6 to 58.2 kg/ha/year between 1997-2013. Following a trend of adoption of existing, accessible technology, it could reach 69.7 kg/ha/year by 2020. In a zero-deforestation scenario calculated by Agroconsult and Agroicone, this is only 3% short of the productivity gain that is needed to attend the growth in market demand in the current pastureland areas of 71.1 kg/ha/year (Agroicone & Agroconsult 2013).

This may seem like a tiny incremental gain in productivity to attain a zero deforestation beef sector, but this is a false impression. This productivity increment would have to be achieved across more than 165 million hectares and across many cattle ranchers who still retain forests on their ranches that can be legally cleared (Soares Filho et al. 2015b).

Since 1970 the operating profit, earnings before interest and taxes (EBIT), for full-cycle cattle ranching has dropped 85%. (Figure 9) In other words, the increase in productivity through adoption of new technology is a survival issue. Acrimat estimates that approximately 30% of cattle ranchers could leave the activity if they do not achieve greater efficiency in their production systems. (Acrimat 2012).

**Figure 9: Decrease in Earnings Before Interest and Taxes (EBIT) in Brazilian Cattle Ranching**

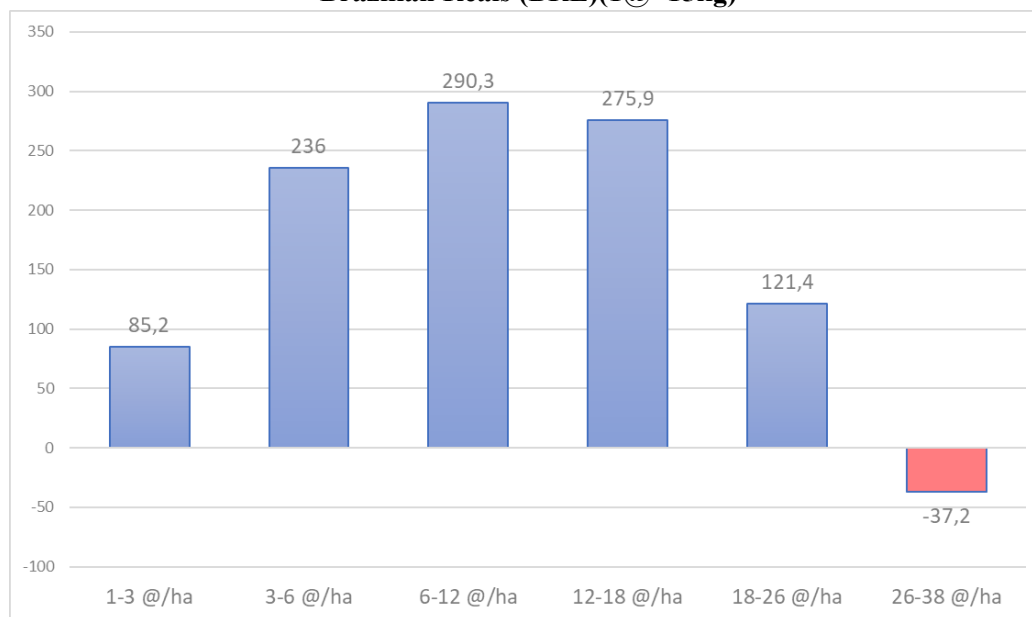


Source: Agroconsult 2013

The average improvement in productivity could take place through the adoption of technology by the most efficient producers as less efficient operators leave the industry.

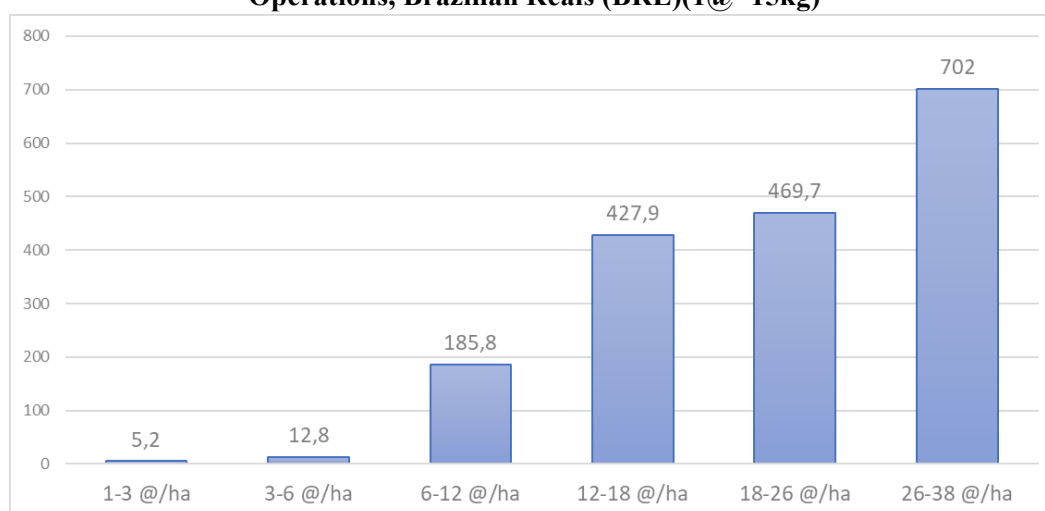
Agroicone also shows EBIT across six levels of technology adoption, in two different phases of the cattle ranching process: breeding (Figure 10) and raising/finishing (Figure 11) (Harfuch et al. 2017).

**Figure 10: Operating Profit across Levels of Technology Adopted in Breeding Operation, Brazilian Reais (BRL)(1@=15kg)**



Source: Agroconsult 2013

**Figure 11: Operating Profit by Levels of Technology Adopted in Raising and Finishing Operations, Brazilian Reais (BRL)(1@=15kg)**



Source: Agroconsult 2013

Traditionally, breeding operations are in the forest frontiers and are more viable with low technology levels. Maximum profitability is achieved in the medium range of technology. Fattening and finishing systems are more technology friendly with responsive results at all levels and with high EBIT.

Almost all cattle ranchers are aware of the need to adopt technology and raise their productivities. However, with the steady decline in profitability in recent decades and the long period needed to recover investments made in intensification (20-40 months), a critical limitation to intensification of beef production in the Amazon region is financial. (Figure 9)

Based on the investments made over the last years, each additional increment of production (arroba/ha; 1@=15kg) represents around USD\$440/ha of investments. Therefore, a 500 hectare ranch that seeks to increase productivity from 6 to 7 @/ha/year must invest USD\$220,000. About 75-80% of this amount will be herd expansion through the purchase of new animals (Harfuch et al. 2017).

Integrated crop-livestock systems (ICLS) are one of the most promising technologies, allowing three crops/year in the same area (de Morães et al. 2014). (Figure 12) Greater adoption of ICLS can potentially reduce deforestation related to both cattle production and soy/corn cultivation, if accompanied by measures to inhibit forest conversion.

**Figure 12: Crop-pasture integrated system in Rondonopolis-MT.** (This field was under soybean and corn cultivation a few months prior to this photo)



Source: João Shimada

## 6. Brazilian Cattle Agreement

**Figure 13: Slaughtering the Amazon Campaign Logo**



Source: Greenpeace

### 6.1 Background

The BCA was a response to both the threat of legal action by the Ministério Público Federal (MPF) in Pará state and the public awareness campaigns led by Greenpeace and Amigos da Terra-Brasil.

In June 2009, Greenpeace issued a report titled “Slaughtering the Amazon” accusing major

international meat and leather brands of contributing to illegal deforestation by selling products sourced from slaughterhouses and cattle ranches involved in extensive land clearing. Some of the brands named in the report include Carrefour, Walmart, Adidas, BMW, Ford, Honda, Gucci, Nike, Tesco, Toyota, among many others (Greenpeace International 2009a). (Figure 13)

Facing mounting pressure after the release of the report, in October 2009, the four largest Brazilian beef companies, Bertin, JBS, Marfrig and Minerva, decided to sign the BCA. These companies committed to cease cattle purchases from ranches that had deforested after October 5<sup>th</sup>, 2009 in the Amazon biome from their supply chains. They also pledged to exclude ranches linked with forced labor and the invasion of indigenous land or protected areas. The four companies were responsible for 50% to 80% of cattle slaughter in Amazon biome, making them well poised to transform the beef supply chain by adhering to these promises.

The beef industries participating in the agreement needed a way to monitor their direct suppliers and implement the BCA. Geo-referenced systems were developed that could locate each ranch supplier. Overlaying ranch locations with deforestation history, protected area boundaries, and indigenous land boundaries allowed violating suppliers to be identified. Suppliers found in violation of the agreement were excluded from the supply chain and embargoed by the four slaughterhouses.

In March 2017, an IBAMA<sup>2</sup> operation named *Carne Fria* traced 58,000 head of cattle supplied by 26 embargoed ranches to slaughterhouses in Pará, Bahia, and Tocantins. Among these slaughterhouses, two units of JBS, located in Redenção and Santana do Araguaia in Pará state, bought 49,468 heads and were fined R\$24.7 million (Barreto. et al 2017).

Greenpeace considered this incident to be a severe violation of the BCA and decided to drop out of the agreement all together. The beef industry decided to continue adhering to the principles of the BCA and still apply its criteria to all purchases in the Amazon biome.

## **6.2 Outcomes**

Pastures cover 49 million ha in the Brazilian Amazon biome on 310,000 individual ranches (ABIEC 2017). The sheer number of ranches that must be reached means that public initiatives need to engage slaughterhouses to succeed. The BCA provides that engagement.

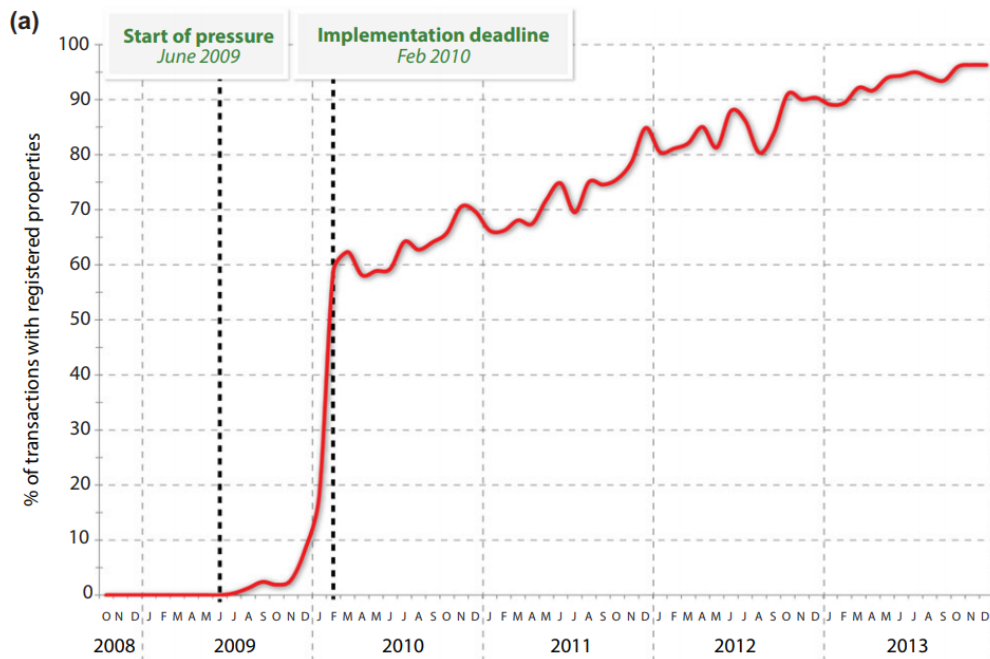
Research conducted by Gibbs et al. (2015) analyzed the outcomes achieved by the beef industry when comparing slaughterhouse purchasing processes before and after the establishment of the BCA. They also compare supplying versus non-supplying ranches.

They found a strong effect of the BCA on rancher behavior. The performance in terms of the Rural Environmental Register (CAR) registration rate within the supply chain was remarkable. In 2006, before the BCA was initiated, only 2% of suppliers were registered. After BCA implementation, by early 2010, nearly 60% were registered, and by the end of 2013 96% of suppliers were registered. (Figure 14)

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<sup>2</sup> Brazilian Institute of the Environment and Renewable Natural Resources

**Figure 14: Supplier Ranches Registered under CAR Comparison Before and After the BCA**



Source: H.K. Gibbs

The real measure of BCA impact, of course, is between participating and non-participating ranchers. For this comparison, Gibbs et al. found that ranch properties that sold to BCA processing plants completed their CAR registration nearly two years sooner than those who did not participate. Of the supplier ranchers that were surveyed, 85% declared the BCA was the driving force for their registration.

More recently, Alix-Garcia and Gibbs (2017) found that participation in the CAR resulted in a 10% reduction in deforestation in Mato Grosso and Pará states between 2005-2014, showing the importance of the CAR as the first step in implementing avoided deforestation in private lands.

Comparing the BCA reports delivered by companies shows that in 2009, 36% of suppliers had recent deforestation. This fell to 4% in 2013, and the last audit reports delivered in late 2017 reveal very high levels of compliance with the BCA in 2016 at 100% for Minerva, 100% for Marfrig, and 99.7% for JBS.

These achievements show how effective the BCA was at building a virtually deforestation free direct supply chain with active participation of beef processing companies. However, despite these remarkable achievements it is very difficult to quantify the contribution of the BCA to the 70% decline in deforestation rate in the Brazilian Amazon. Potential problems that are less detectable at first glance should also be recognized. The narrow scope of the BCA opens the door to issues of laundering and leakage, which could mean the BCA's contribution to Brazil's deforestation slowdown was quite modest (Alix-Garcia et al. 2017).

## 6.2 Significance

Cattle pasture exists on more deforested land than any other land use system. It is the most common land cover type on deforested area across Latin America. In the Brazilian Amazon, cattle pastures cover approximately 70% of deforested land. Cattle pastures are also popular for cultural reasons and are a relatively stable source of income.

However, it is not accurate to conflate the prevalence of cattle pasture as a land cover in the Brazilian Amazon with the assertion that cattle pastures themselves are the primary driver of deforestation. The land speculation market is a very powerful driver of deforestation that uses the formation of cattle pasture as a way to secure titles to land claims. Land-grabbers (*grileiros*) who are trying to claim a tract of land will often clear forest and plant cattle pasture to demonstrate to the government that land is under productive use, which is a requirement for land titling. This is an important reason cattle pastures are so prevalent in the Brazilian Amazon despite their low levels of profitability.

The BCA is comparable to the Brazilian Soy Moratorium in its global importance as a vast, sector-wide, regional experiment on the utility of value chain efforts to slow tropical deforestation. However, the BCA differs with the Soy Moratorium in three fundamental aspects:

- Most beef produced in the Amazon is destined for Brazilian consumers. The influence of the sustainability-oriented European Union market, which has been a key source of ongoing pressure on the soy sector to remain deforestation free, is much smaller for Amazon beef than for Amazon soy.
- Most cattle that are slaughtered in the Amazon have been on more than one ranch, increasing the difficulty of tracing the origins of cattle purchased by processors.
- The Brazilian Amazon beef industry is an oligopsony (few buyers), with prices paid to producers established at artificially low levels and generally nothing paid for hides or drop (Merry and Soares-Filho 2017).

Monitoring of compliance with the BCA has been the responsibility of the processors and has generally been limited to direct suppliers of cattle from fattening/finishing operations. Cattle from calving (breeding) and fattening operations are not part of this monitoring.

Oversight of this self-monitoring is insufficient. Falsification of monitoring information takes place. This was documented by operation *Carne Fria*, which resulted in the closure of two JBS processing plants after the presence of cattle purchased from ranches embargoed by IBAMA for illegal deforestation was detected (Gaworecki 2017b).

The BCA also does not have a mechanism for influencing fake cattle ranches, where the main purpose of cattle pastures is to facilitate land grabbing.

Like the BSM, the BCA has reinforced the policy from the Brazilian government that Amazon producers who are actively deforesting their land will face difficulties. In addition to the threat of losing access to public farm credit or being issued a fine, cattle producers who sell to JBS, Marfrig, and Minerva face the risk of being excluded from the market unless they produce in compliance with the BCA requirements.

It is very difficult to quantify the contribution of the BCA to the 70% decline in deforestation in the Brazilian Amazon, but we estimate this contribution to be quite modest. Alix-Garcia and Gibbs (2017) estimated the impact of the BCA on deforestation from 2007-2015 in Mato Grosso and Pará states and found no impact, pointing to the need to expand the traceability to the full supply chain.

As explained in the LEAVES Soy Report, Brazilian Amazon's deforestation rate also declined because of several other factors:

- Plan for the Prevention and Control of Amazon Deforestation (PPCDAM): The BCA was launched when the Brazilian Government was five years into the implementation of the PPCDAM, orchestrated across 13 government agencies including the Central Bank and military police. This policy targeted illegal land and timber operations through sting operations, eventually suspending



access to farm credit in high-deforestation municipalities.

- Protected Areas: The 68% expansion in protected areas beginning in 2004 reduced the amount of deforested land that was available to land grabbers by diminishing the likelihood of eventual titling.
- Reduced demand for new land: The Amazon beef industry entered a post-beef period in the mid-2000's, with production growing on a shrinking area of pasture.

#### **6.4 Public Actions that Facilitated the BCA**

The BCA was motivated, in part, by the threat of legal action by the MPF of Pará state. The MPF established an Agreement Adjustment Term (TAC) with the processors that obligated them to only purchase cattle from farms registered in the CAR, those preventing illegal deforestation and forced labor, or those invading public or traditional communities' lands. (Ministerio Publico Federal 2013a, 2013b).

The TAC is a legal commitment and non-compliance authorizes the MPF to adopt sanctions without court intervention. Half of active meatpacking plants, responsible for 70% of the slaughter capacity have signed it (Barreto et al. 2017)

The BFC provided indirect regulatory support to the success of the BCA. Because of the BFC requirement that 80% of private landholdings in the Amazon region be maintained as forest cover, Amazon cattle operations began the BCA with little forest that could be legally cleared.

The Brazilian government's deforestation monitoring systems DETER and PRODES and the CAR have contributed to the BCA monitoring, reporting and verification strategy.

Farmers have opposed the BCA as it punishes law-abiding, conservation-minded producers by eliminating their right to carry out legal deforestation under the already restrictive Forest Code. If the farm sector continues to oppose the BCA, it is likely to receive little support from the government.

#### **6.5 Prospects for Continuation of the BCA**

Key factors to the success of the BCA in the Brazilian Amazon included the CAR, reliable deforestation polygons made public each year through governmental agencies (INPE-PRODES), and the concentration of cattle purchasing by a small number of companies. The long-term sustainability of the BCA will depend upon the delivery of some form of positive incentive to the ranchers that meet the BCA requirements.

A former partner of BCA, Greenpeace, is conducting a public advertising campaign advocating for beef industries to gain full control of the supply chain, including tracing their indirect suppliers. In the campaign they refer to the last "Carne Fria scandal", arguing that it reveals the fragility of internal control systems and the need for more social control, transparency, and public access to relevant information. Greenpeace also claims to be interested in more engagement with companies committed to zero deforestation, asking for practical measures to be taken from the big three Brazilian retailers: Pão de Açúcar, Carrefour, and Wal-Mart.

#### **6.6 Scalability and Replicability**

The essential elements of a successful sector-wide agreement for cattle include:

- Reliable, official maps of property boundaries (e.g. the CAR);
- Participation of slaughterhouses that represent a majority of the market; and
- Reliable and credible monitoring and verification of direct and indirect supplier performance against agreement rules.

In the Cerrado biome, where the Forest Code requires only 20% (outside of Legal Amazon boundary) or 35% (inside the Legal Amazon boundary) of native vegetation conservation on private properties, the costs to farmers of a BCA are much higher as there is more native area that can be legally converted to pastures.

### **6.7 Lessons learned and Needed Adjustments**

Why did the beef companies not resist accepting the terms of TAC and BCA? The agreements created commercial risks for the beef companies by putting pressure on their customers, big brand retailers. The MPF also launched a TV campaign alerting consumers about the illegal origins of beef. The coordinated action between these two initiatives made them much more powerful.

The MPF action alone would have taken a long time to come to fruition. Without the legal framework of full Forest Code implementation and pressure from the market, the juridical process would have been long and uncertain. Beef companies likely would have preferred this drawn out juridical process, where they may have stood a reasonable chance of avoiding penalty, to the signing the TAC. This is a clear example of how public policy and supply chain approaches reinforce each other and can create more urgency to shift to a sustainable production model.

However, even with virtually full compliance with BCA by the signatory companies, the deforestation associated with cattle ranching remains high, and the total deforestation rate has climbed over the last years, reinforcing the points discussed above. Some additional important points to consider are:

- Many slaughterhouses supplying to internal and regional markets did not adopt the environmental commitments (Ministerio Publico Federal 2018; Barreto et al. 2017);
- Laundering and leakage are likely significant issues, with cattle moved to ranches in compliance with the BCA for sale to the processors (Barreto et al. 2017);
- The majority of Consumer Goods Forum (CGF) companies did not put in place practical measures to comply with their zero-net-deforestation pledges (Supply Change 2017); and
- About 74% of the leather in Brazil is exported. Top importers are Italy and China, with China leather manufacturing entering the EU afterwards. Because of this, about 85% of Brazil's leather production enter markets that are potentially susceptible to concerns about deforestation, while for beef the total is only 40% (Walker et al. 2013).

The last TAC's audit report delivered by MPF in March 2018 for the State of Pará, covering 74% of statewide slaughter capacity, reinforces the need for adjustments in the process. The report recommends improving the traceability of slaughterhouse suppliers in order to avoid laundering, updates to the supplier database, and sampling methodology (Ministerio Publico Federal 2018).

Even if all of these efforts succeed, the elimination of deforestation is not guaranteed without government actions that strengthen frontier governance. This is needed for the enforcement of the Forest Code in addition to addressing structural issues like land tenure regularization, better planning of agrarian reform settlements, better planning for infrastructure in the Amazon region, better management of protected areas, and improving the quality of life for the Amazonian population.

## 7. Mato Grosso Produce, Conserve and Include (PCI) Strategy

Figure 15: PCI Strategy Official Logo



Source: PCI

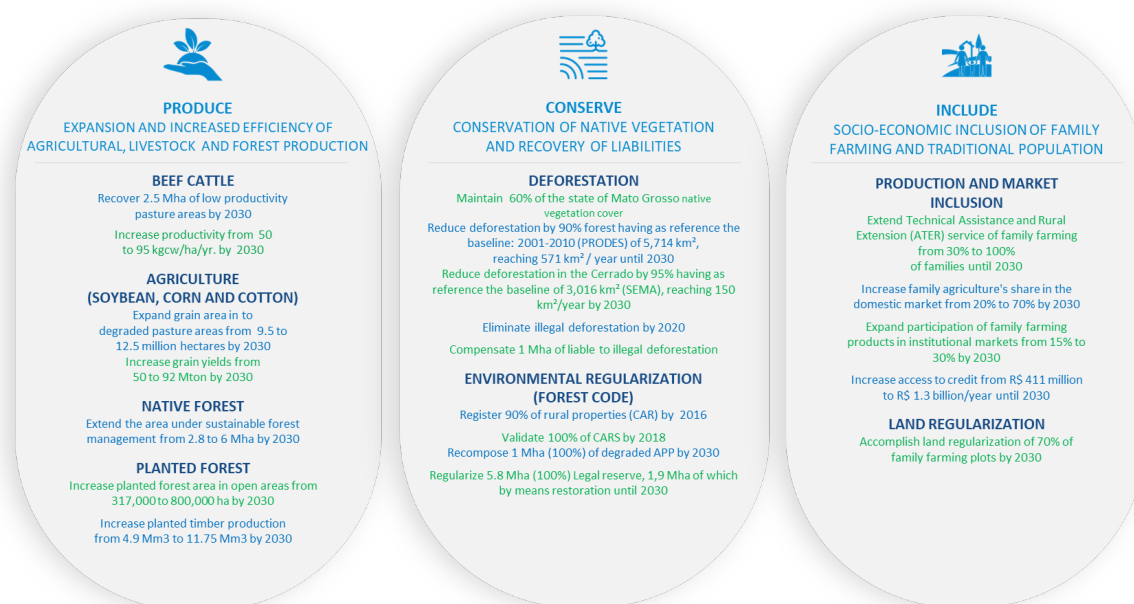
### 7.1 Background

One of the principle lessons of both the BSM and the BCA is the importance of linking value chain initiatives with governments. One might characterize this opportunity as bringing the market influence and agility of the private sector together with the power of public agencies, policies and programs. One of the leading illustrations of this power is the Mato Grosso Produce, Conserve, Include (PCI) Strategy.

When Pedro Taques was elected as the Governor of Mato Grosso in late 2014, it reinvigorated the institutions working on sustainability in Mato Grosso after years of ineffective dialogue with the previous government. The opportunity for Mato Grosso to return to its role as a global leader in the reconciliation of growing agricultural production and environmental conservation was renewed (Macedo et al. 2012). After assuming the governor's seat in early 2015 and engaging in strategy discussions with individuals who had been working in the State for many years. Taques saw the international opportunities in the lead up to the Paris Climate Summit. As a result, Taques decided to develop a state-wide plan for sustainable development to be announced in Paris later that year.

In a mere 45 days, a multi-sectorial and multi-stakeholder working group, including most critical actors in the state, came to consensus on a set of state-wide, wall-to-wall targets. (Figure 16) The formal commitment to achieving these targets was launched in December 2015 during the UNFCCC-COP21 in Paris by Governor Pedro Taques as the PCI Strategy (PCI 2017). The genesis of the PCI illustrates the speed with which major jurisdictional strategies can be designed when political will is present.

**Figure 16: Mato Grosso State PCI Strategy Targets by 2030**



Source: PCI

## 7.2 Outcomes

The PCI is focused on social and economic development through sustainable land use, with three main objectives:

- Expand and increase commodity production through intensification and increasing productivity;
- End illegal deforestation, protect remaining forests, and promote restoration according to the Forest Code; and
- Promote social and economic inclusion and improve the quality of life for smallholders, traditional communities, and indigenous people.

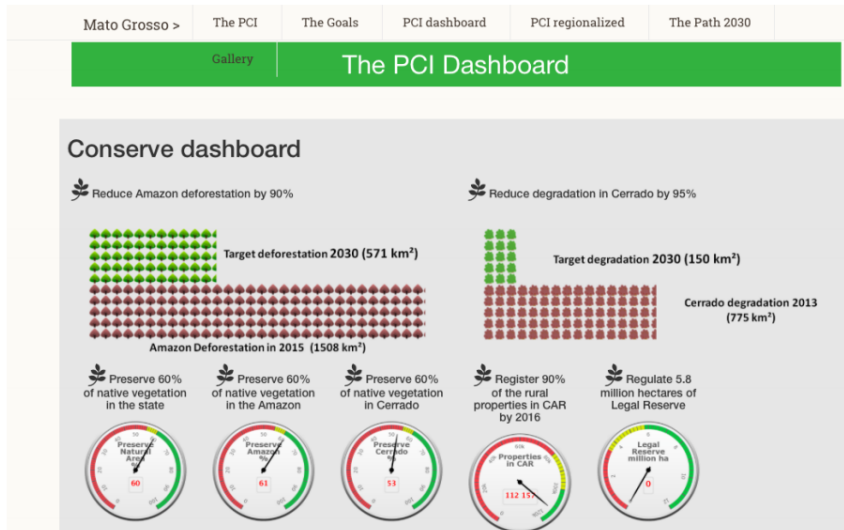
These objectives were divided into three axes, each one coordinated by a different State government agency as follows:

- “P” Axis – “Produce” coordinated by SEDEC (State Secretary of Economic Development)
- “C” Axis – “Conserve” coordinated by SEMA (State Secretary of Environment)
- “I” Axis – “Include” coordinated by SEAF (State Secretary of Family Agriculture)

## 7.3 Monitoring, Reporting, Visualization

To monitor the 21 targets in PCI, a set of indicators was selected based on reliable, easy, and public sources of data. These indicators will be measured periodically to track performance over time. However, some targets lack information available for monitoring. These targets will be tracked using a combination of indicators that generate a composite approach to measuring progress towards the end-goal. Transparency will be guaranteed by a public access platform under development by Earth Innovation Institute in a dashboard format that is easily understandable. (Figure 17)

**Figure 17: Mato Grosso State PCI Strategy Monitoring Platform**

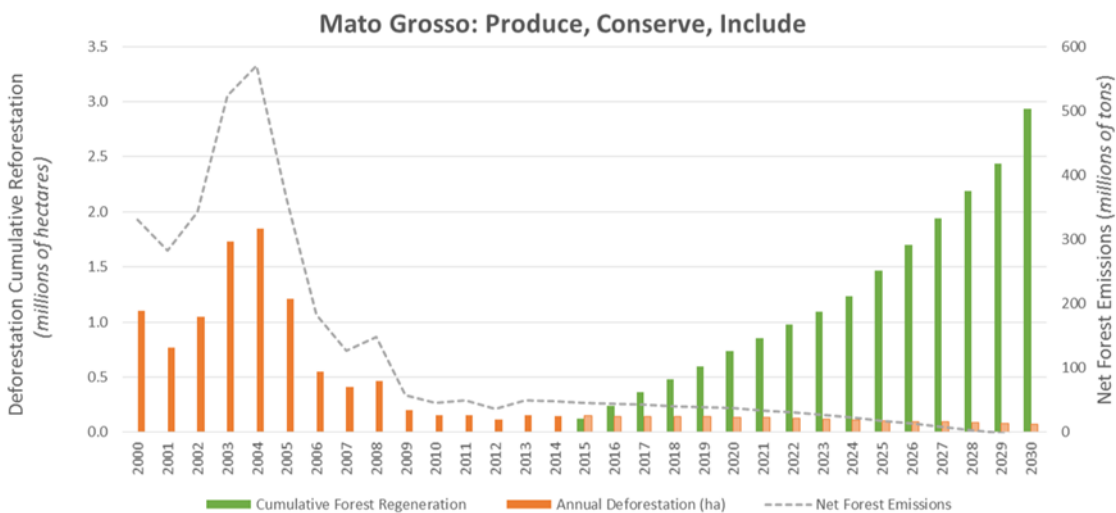


Source: [pcimonitor.org](http://pcimonitor.org)

### 7.4 Significance

PCI is remarkable both in its consensus-based evolution over a short time period, and in its relevance in terms of climate change mitigation. If successful, the PCI will keep 6 Gigatons of CO<sub>2</sub>eq out of the atmosphere by 2030. (Figure 18) If there were a ranking among Paris Agreement pledges, the PCI would be among the top 10 most ambitious proposals.

**Figure 18. Historical and Projected Annual Deforestation, Cumulative Area of Recovering Forest, and Net CO<sub>2</sub> Emissions if The PCI Conserve Targets Are Attained**



Source: EII 2015

The PCI was institutionalized by a governmental decree in March 2016, and the governance of the strategy was delegated to a multi-sectorial group called the State Executive Committee of the PCI Strategy (CEEPCI), composed of the following institutions:

(Note: Founding institutions are indicated with an asterisk).

- Sector Institutions
  - ABAG – Brazilian Agribusiness Association
  - ACRIMAT – Mato Grosso Cattle Ranchers Association\*
  - ACRIMAT – Mato Grosso Pork Producers Association
  - AMPA – Mato Grosso Cotton Producers Association
  - ANOREG – Notarious Offices Association
  - APROFIR – Beans Producers and Irrigation Association
  - APROSOJA – Soy and Corn Producers Association\*
  - AQUAMAT – Mato Grosso Aquiculture Association
  - AREFLORESTA – Re-forestation Association
  - CEASA – Agricultural Goods Trade Center
  - CIPEM – Mato Grosso Timber Industry Center
  - FAMATO – Federation of Agriculture of Mato Grosso\*
  - FEPOIMT – Federation of Indigenous People of Mato Grosso
  - FETAGRI – Federation of Agriculture Workers of Mato Grosso\*
  - GTPS – Brazilian Cattle Ranching Roundtable
  - RTRS – Roundtable on Responsible Soy
  
- Government
  - EMBRAPA – Brazilian Agriculture Research Company
  - GAE – State Government Strategic Issues Office\*
  - MT FOMENTO – State Government Development Agency
  - SEAF – State Secretary of Familiar Agriculture\*
  - SEDEC – State Secretary of Economic Development\*
  - SEMA – State Secretary of Environment\*
  - SEPLAN – State Secretary of Planning
  - SETAS – State Secretary of Labor and Social Assistance
  
- Prosecutors
  - Federal Prosecutors Office
  - State Prosecutors Office
  
- Non-Governmental Organizations
  - Aliança da Terra
  - Amigos da Terra Brasil
  - EDF – Environmental Defense Fund\*
  - ECOarts.org.br
  - EII – Earth Innovation Institute\*
  - ICV – Instituto Centro de Vida\*
  - Instituto Ação Verde\*
  - IPAM – Instituto de Pesquisas Ambientais da Amazônia\*
  - ISA – Instituto Socioambiental\*
  - TNC – The Nature Conservancy
  - WRI – World Resources Institute
  
- Private Sector
  - Agroicone\*
  - Althelia Fund
  - Amaggi\*
    - Carbon Trust

- Carrefour
- Fazenda São Marcelo
- Fundação MT
- IDH – The Sustainable Trade Initiative\*
- IMAC – Mato Grosso Beef Institute
- Marfrig Global Foods\*
- ONF Brasil
- PECSA – Amazon Sustainable Cattle
- Roncador

Group

### **7.5 Public Actions that Facilitated the PCI**

In 2009, during the UNFCCC-COP at Copenhagen, Blairo Maggi, the governor of Mato Grosso at the time announced a very ambitious target to reduce state deforestation 89% by 2020 as part of the Action Plan of Prevention and Control of the Deforestation and Fire (PPCDQ).

In 2012, Mato Grosso had achieved an 88% reduction compared with the historical baseline. However, due to trouble with government dialogues before 2014, the state experienced some reversals of this performance. The PCI strategy represents an opportunity to reform this agenda, resulting in the PPCDQ targets being incorporated into PCI. The third phase of PPCDQ offered new mechanisms beyond traditional command and control tools, including prevention lines that trace value chains using mechanisms like CAR.

Mato Grosso was also the second state to implement the REDD+ regulatory framework (after the State of Acre) for the three biomes inside the state (Amazon, Cerrado, and Pantanal), to promote a progressive reduction of greenhouse gases in line with achieving PPCDQ targets.

In January 2017, a new state policy for climate change was sanctioned. The policy aligned with national policy and the Brazilian Nationally Determined Contributions (NDC). This law created the legal framework for implementing sectorial plans for energy, transportation, industry, mining, public sector, agriculture, biodiversity, forest, land-use change, hydric resources, waste, construction, and health. The local municipalities will play an important role in any sustainable development plan as all effective initiatives must find traction on the ground. Mato Grosso has an initiative in the works called the Sustainable Municipalities Program (PMS), which aims to strengthen the local economy, improve local governance, and reduce deforestation and degradation.

The municipality participants of PMS must develop an action plan that includes three axes: a) strengthen local management, b) regularize environmental and land tenure, and c) promote sustainable value chains focusing on familiar agriculture. Of the 141 municipalities in Mato Grosso, 34 have already developed their plans.

### **7.6 Prospects for Full Implementation of the PCI**

The PCI strategy carries enormous weight not only in terms of the ambitious targets and relevance to climate change, but also in the amount of resources involved. The financial investment needed to achieve full implementation over the next 13 years is roughly US\$14.5 billion, or around US\$1.1 billion/year.

All governmental levels (municipal, state, federal) in Brazil face huge constraints in their budgets to the point that even essential public services have been impaired in recent years. Brazilian political and economic crises still have a long way to go before they are solved, and public funding will not be enough to finance the PCI Strategy. The capacity to design innovative financial mechanisms,

including improving the capacity to leverage private investments, is crucial for the success of PCI.

The first positive signal came in the form of payment for performance through KfW<sup>3</sup>'s REDD+for Early Movers (REM) program investing €17 million and £35 million from the UK (Earth Innovation Institute 2017). Although it was far from enough funding, it sent a positive and meaningful signal to all actors involved. Another important contribution of the REM/UK contract was the crystallization of PCI. Elections and government staff changes are always critical moments as lack of continuity has destroyed many projects with great potential in Brazil. However, contracts, such as the one used for PCI, have the power to galvanize commitment.

### **7.7 Lessons Learned and Adjustments Needed**

The private sector, governments, and NGOs are increasingly finding it difficult to meet their sustainability objectives without cooperating with others. Examining the broader landscape offers opportunities to address a far greater number of actors, which should increase the probability of successful outcomes. The PCI strategy is the first sub-national state program that brings actors and stakeholders across all sectors together to address sustainability at the jurisdictional level.

Recent review articles (Lambin et al. 2018; Nepstad et al. 2013, 2014) concluded that corporate deforestation pledges alone are insufficient to solve deforestation. They should be viewed as strategies that are complementary to public policies and programs. Lambin et al. (2018) reached their conclusions based on evidence of leakage, the narrow scope of sanctions, and certification processes that are too costly and small scale.

The jurisdictional approach to tropical deforestation is designed specifically to promote harmonization between corporate deforestation commitments and public policies (Nepstad et al. 2013, 2014; EII 2017). The PCI, perhaps the world's largest jurisdictional approach experiment, is designed to harmonize public policies with private sector commitments and needs through a consensual set of targets. The full implementation of PCI could represent a very low corporate risk for investors and the market. To achieve this, PCI targets must be translated into clear market rules that are able to support future sourcing agreements and that socialize the PCI with local governments and farm sectors, as described in the Soy Report.

## **8. The Mato Grosso Meat Institute - IMAC**

Another potentially important approach for achieving transformations in food commodity sectors to lower environmental and social footprints is a sector marketing strategy institution. Inspired by meat marketing initiatives in other countries such as the Meat and Livestock from Australia (MLA), the Beef and Lamb<sup>4</sup> of New Zealand, and the National Meat Institute from Uruguay (INAC), Mato Grosso was the first Brazilian state to create an institution to promote its beef production. The Mato Grosso Meat Institute (IMAC) is a multi-sectorial partnership bringing together government through the Economic Development Secretary (SEDEC), producers through Mato Grosso Cattle Ranchers Association (ACRIMAT), and the private sector through Mato Grosso Meatpackers Union (SINDFRIGO).

The main role of IMAC is to respond to the increasing demand for quality and sustainability from the

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<sup>3</sup> The **KfW**, formerly *KfW Bankengruppe* (banking group), is a [German government-owned development bank](#), based in [Frankfurt](#). Its name originally comes from **Kreditanstalt für Wiederaufbau** ("Reconstruction Credit Institute"). They have created the REM program to incentivise sub-national governments to engage in deforestation reduction through REDD+.

<sup>4</sup> Official agency with the mandate to conduct outreach on the national product.



markets in an integrated way by building a comprehensive standard that addresses social, environmental, tributary, sanitary and intrinsic quality issues. IMAC is designed to overcome the inefficiencies of government mechanisms for controlling meat quality. The IMAC platform will promote the integration of these mechanisms to ensure greater market access of meat products from Mato Grosso.

The IMAC initiative brings a promising perspective to the beef sector, improving the sector wide transparency and *sine qua non* condition to qualify for any incentives or benefits. The lack of market recognition by this effort and the poor performance can promote a negative backlash, strengthening the most conservative groups.

## 9. VISIPEC

Only a small area of forests is effectively protected by the BCA, as concluded by Gibbs et al. (2017). Considering the two largest beef producers states in the Brazilian Amazon, only 17% of cattle ranches are covered by the agreement's monitoring systems, indicating the need to strengthen the monitoring to the indirect suppliers and also to all meatpackers plants.

Visipec brings the perspective to map direct and indirect suppliers to all meatpackers plants, linking CAR registries with the Animal Transportation Delivery Note (GTA) properties, increasing the agreement's monitoring coverage from 17% to 85%.

## 10. Conclusions

This study has examined beef-related deforestation in the Brazilian Amazon with a focus on the BCA. The BCA has achieved nearly 100% compliance among the cattle ranches that sell directly to participating slaughterhouses. However, the deforestation problem is still far from solved. Our research identified important questions:

### Missing carrots

As is the case with most corporate zero-deforestation pledges, there is an absence of positive incentives for compliant farmers. As was the case with the BSM, law-abiding farmers are penalized by the BCA. To recognize farmers who are good actors, it would be useful to help them to improve productivity, to restore pastures, to adopt innovative models like integrated crop-livestock systems, to improve zoo-technical indexes, and to offer sustainable production at scale to the international market.

### Traceability and feasible monitoring

A mechanism for tracing cattle back to breeding or calving operations is not yet available. This means the implementation of the BCA is limited to only the last tier of the cattle value chain. This is not a simple task. It involves many technical limitations and controlling innumerable critical points and commercial transactions, many of them made informally. Jurisdictional approaches could reduce the transaction cost for full traceability by combining animal tracking with sourcing area tracking.

### Land grabbing

The BCA model does not address deforestation driven by land grabbing, where cattle are sold to clandestine processors or laundered by licensed farmers. Solutions include land tenure regularization and implementing an ecological and economic zoning plan defining uses for un-designated land.

### The government case

Many sustainable supply chain initiatives operate under the assumption that governments are not reliable partners in sustainable development and are implemented with little concern for how the zero-deforestation agenda will harmonize with public policies in the production region. In this regard, the

PCI Strategy demonstrates that shared government-private sector-NGO strategies are feasible, with a high level of ambition for solving tropical deforestation.

One comment we have heard from those who work with sustainable supply chain initiatives is that working with both the government and farm sectors is too slow and does not lead to sufficiently ambitious targets. Our response to this comment is that the long-term sustainability of the progress made in slowing deforestation through sustainable supply chain initiatives disconnected with public policies and farm sectors is probably quite low.

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**Interested in learning more? Contact:** Dora N. Cudjoe: [dcudjoe@worldbank.org](mailto:dcudjoe@worldbank.org) | Erick C.M. Fernandes: [efernandes@worldbank.org](mailto:efernandes@worldbank.org)



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