Soy Moratorium in Mato Grosso: Deforestation undermines the agreement

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ABSTRACT

Brazilt is one of the world leaders in replacing forests with agriculture. Agribusiness has responded to international public opinion by introducing the Soy Moratorium, (SoyM), an agreement that aims to inhibit the destruction of forests to plant soy in the Brazilian Amazon. This pressure led to the creation of a joint working group comprised of representatives from the civil society, soy producers, and finally the Brazilian government. In this article, we analyze all the areas that were forested in 2006 and are now planted with soy in the Amazonian municipalities in the state of Mato Grosso. During the period in which we analyzed deforestation between 2009 and 2016, we identified 54 municipalities that were not in compliance with SoyM; a total of 59,972 ha had been converted to soy plantation. These results can be ascribed to several reasons, one of which is, essentially, that SoyM has not been able to reach the offending producers. If we consider deforestation starting in 2006, the amount of soy grown in violation of SoyM would be equivalent to an estimated total of 350,000 tons $^{-1}$, or 9700 truckloads, only in the 2016/17 harvest. Nevertheless, even with these less satisfactory results, SoyM, the first voluntary zero-deforestation agreement implemented in the tropics, should be seen as a commendable initiative to engage all segments, including society, the productive sector, and the government, in this process. It merely needs to be refined, with all the groups involved in discussing new strategies in an international forum.

1. Introduction

Brazilt is one of the world leaders in replacing forests with agriculture. Debates about how deforestation contributes to global warming have raised questions among residents of the largest markets for Brazilian commodities, such as meat and soy, about whether consumption of these products damages the forest. These questions have affected the relationship between importers and the Brazilian agribusiness sector, which has felt a need to demonstrate that their products are produced in a sustainable way. Agribusiness has responded to international public opinion by introducing the Soy Moratorium, (SoyM), an agreement that aims to inhibit the destruction of forests to plant soy in the Brazilian Amazon. This pressure (Greenpeace, 2006) led to the creation of a joint working group comprised of representatives from the civil society, soy producers, and finally the Brazilian government. Their work gave rise to SoyM, an agreement that calls for large companies to avoid buying soy from producers who began cultivating the crop in areas deforested since July 24, 2006.

As of July 24, 2006, the Brazilian Association of Vegetable Oil Industries (ABIOVE) and the Association of Cereal Exporters in Brazil (ANECE) hired a company to monitor the deforestation of areas larger than 100 ha (ha) in municipalities with more than 5000 ha of soy plantations in the Amazonian biome in the states of Mato Grosso, Pará, Rondônia, Roraima, and Amapá. The monitored area initially included 37 municipalities (ABIOVE, 2017). The company's ninth annual report, which covered the 2015/2016 harvest using deforestation data from 2009, sampled the 87 municipalities responsible for 98% of the area planted with soy in the biome, and also identified deforested areas larger than 25 ha. It was found that over the consecutive years in which the monitoring was conducted, soy was planted on 37,155 ha in violation of SoyM; this represented 1.1% of the area deforested in the biome during that time, and accounted for 4.6% of the cases of deforestation in the 87 municipalities sampled in the most recent report (ABIOVE, 2017). As these data demonstrated SoyM's success (Rudorff et al., 2011), it was considered a milestone in reducing the rate of Amazonian deforestation by 2014 (Kastens et al., 2017). While the monitoring had previously been authorized only for certain periods of time, it was extended indefinitely in 2016, with no set end date.

2. Expansion of Soy plantations in Amazon biome

The plantation of soy, in turn, tripled in the biome in just a decade, expanding from 1.28 million ha (Mha) to 3.92 M ha, using 2006/2007 as a baseline (the year in which SoyM was implemented (ABIOVE, 2017)). This expansion occurred through the occupation of areas that had been deforested for cattle ranching (Macedo et al., 2012).
Historically, the main driver of Amazonian deforestation has been cattle ranching, as forest is cut down to make way for pasture (Fearnside, 2005). It was expected that soy would be planted only in specific areas where the topography, hydrography, and logistics are appropriate for agribusiness, the occupying areas already having been cleared by ranching (Lima et al., 2011).

In this article, we analyze all the areas that were forested in 2006 and are now planted with soy in the Amazonian municipalities in the state of Mato Grosso (i.e., the state with the largest soy production in Brazil, with 10.2 Mha during the 2016/2017 harvest), located in the Amazon, Cerrado, and Pantanal biomes (SojaSat, 2017) (Fig. 1). To this end, we use data from the SojaSat platform, following methodology adopted by Silva Junior et al. (2017) and long-term vegetation index (Didan, 2015), which covered all the areas of soy plantation larger than 1 ha in the state of Mato Grosso during the 2016/2017 harvest. These data were plotted and overlaid with the areas of deforestation during the period covered by SoyM. The data were provided by the Program for Satellite Monitoring of the Brazilian Amazon Forest (INPE/PRODES, 2017).

### 2.1. Deforested areas

The results showed that at the time of the 2016/2017 harvest, the state of Mato Grosso had 10,281,938 ha of soy plantations, with 6,298,459 ha in the Cerrado biome, 3,981,049 ha in the Amazon biome, and only 2430 ha in the Pantanal biome. Pasture land covered 11,061,296 ha in the state's Amazon biome alone. Between 2009 and 2012, the state's average annual rate of deforestation in the Amazon was 11,061,296 ha in the state's Amazon biome alone. Between 2009 and 2012, the state's average annual rate of deforestation in the Amazon was 78,947 ha per year−1. Between 2013 and 2016, the indices rose again, with an observed annual rate of 117,302.5 ha. This marked a significant increase of 48.58% compared to the four previous years. In 2016 alone, 134,048 ha were deforested (INPE/PRODES, 2017), with soy occupying only 2.54% of the area deforested during the 2016/2017 harvest. These results clearly show that the main driver of deforestation remains cattle ranching, with the conversion of forests into pastures and soy generally occupying areas opened before 2006. On the other hand, they also show that SoyM was not so efficient. Soy remains the second largest vector of deforestation (accounting for 12.45% of the deforestation that occurred in these municipalities during that period (481,893 ha)). With the passage of the new Brazilian Forest Code, the Moratorium’s new baseline date became July 22, 2008, during which time monitoring occurred. If we look back to 2006, the year in which SoyM was established, we find 59 municipalities out of compliance, with 116,502 ha of forest converted to soy plantation. This accounts for 13.18% of the deforestation (884,106 ha) (Fig. 2) (Tables A.2–A.5) since that time. During this period, the conversion of forest-to-pasture-to-soy amounted to 14,962 ha (1.99% of the total 13.18%). In the previous period (2009–2016), the rate was 1.58% (6214 ha).

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### 2.2. Obstacles to the agreement

These results can be ascribed to several reasons, one of which is, essentially, that SoyM has not been able to reach the offending producers. If we consider deforestation starting in 2006, the amount of soy grown in violation of SoyM would be equivalent to an estimated total of 350,000 tons−1, or 9700 truckloads, only in the 2016/17 harvest. While the deforested area can be monitored, the production cannot; this is also true of the Cattle Agreement (an agreement similar to SoyM, adopted by the ranching sector, in which the ranchers argue that the land may be embargoed, but the cattle are not (Gibbs et al., 2015)). A rancher who illegally cleared forest from his land sells his cattle to a neighbor who is in compliance with the agreement, thereby getting...
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