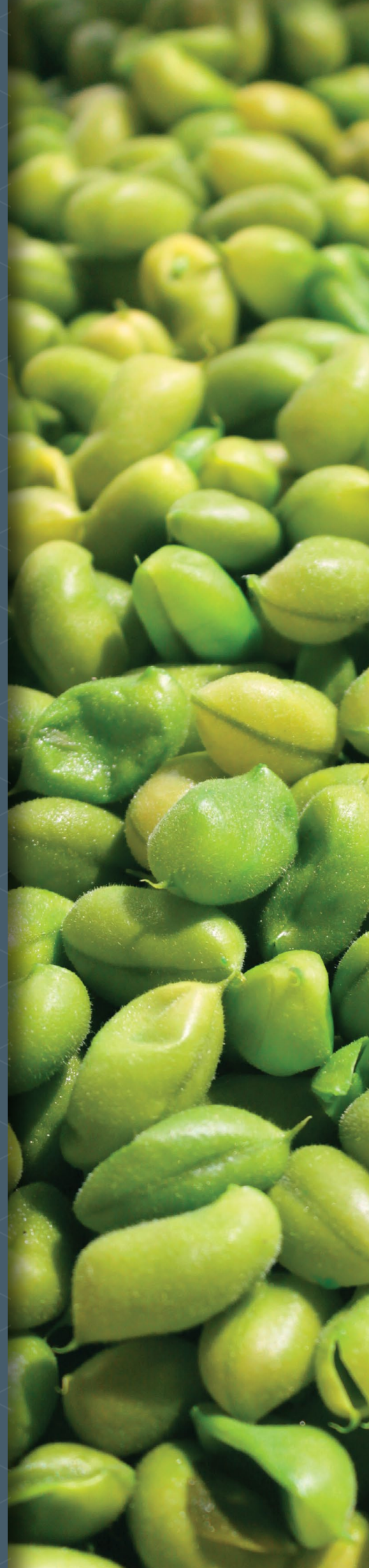

The Business Case for Sustainable Soy Production in the Matopiba, Cerrado



This is the third in the series of brief reports produced with the support from the Government of Luxembourg, which analyze the economics of commodity production practices in tropical regions. The purpose is to help of develop the business case for sustainable land use models that can address drivers of deforestation and land degradation, while being economically viable for producers. To date, analyses have been published for sustainable Robusta production in the Central Highlands of Viet Nam and sustainable beef cultivation in Costa Rica.



01

Introduction

*The Business Case for Sustainable Soy
Production in the Matopiba, Cerrado*



Over the last 50 years, the total global production of production of soybean has increased from 27million tonnes in 1961 to around 350 million tonnes in 2018^{1,2}, driven by increasing global population growth and increased demand for, fueled in part by Asia.³ This has resulted in huge economic benefits for countries like Brazil that have successfully commercialized the crop.

The subsequent agriculture boom for Brazil has not come without cost, since the year 2000 Brazil's area under soy cultivation has nearly doubled^{4,5} making soy one of the main drivers of deforestation in Brazil and leading to significant impacts in both biodiversity loss and greenhouse gas emissions.⁷

Brazilian soybean cultivation has long been associated with the ongoing deforestation and ecosystem conversion of the Amazon biome. Global attention around the plight of the Amazon helped to set the ground for the 2006 the Amazon Soy Moratorium. The Moratorium limits soy production in the Brazilian

Amazon Biome to existing agricultural land, significantly weakened the relationship between deforestation and soy cultivation in the biome and reduced deforestation by 84% from the early 2000s.⁸ However, in the absence of similar protections, other highly biodiverse and carbon-rich ecosystems were still been converted to cropland at a rapid pace. Indeed, the success of the Amazon may have led to spillover effects, increasing in soy production in the neighboring Cerrado biome and triggering an increase in the rate of land conversion as producers, state and the federal government sought out new areas to absorb supply increases that are able to keep pace with the growing global demand^{9,10,11,12}.

The Cerrado is an ecologically unique mosaic of woody savannas and marshes and the second largest biome in South America, located in the highlands of Central Brazil. It covers roughly 2 million km², or 21% of the Brazilian territory. The biome supports essential ecosystem services for much of Brazil, including the provision of water, agricultural production,

A. Carneiro- & F. Costa (2016) 'The Expansion of Soybean Production in the Cerrado' (Agroicone/INPUT, 2016). [retrieved online from: https://www.inputbrasil.org/wp-content/uploads/2016/11/The-expansion-of-soybean-production-in-the-Cerrado_Agroicone_INPUT.pdf]

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V. Voora, C. Larrea, and S. Bermudez (2020), 'SUSTAINABLE COMMODITIES MARKETPLACE SERIES 2019: Global Market Report: Soybeans'. IISD. [Retrieved online from: <https://www.iisd.org/system/files/2020-10/ssi-global-market-report-soybean.pdf>]

V. Zalles, M. Hansen, P. Potapov, S. Stehman, A. Tyukavina, A. Pickens, Xiao-Peng Song, B. Adusei, C. Okpa, R. Aguilar, N. John, S. Chavez, (2019), 'Near doubling of Brazil's intensive row crop area since 2000'. PNAS January 8, 2019 116 (2) 428-435. [Retrieved online from: <https://www.pnas.org/content/116/2/428>]

M. Macedo, R. DeFries, D. Morton, C. Stickler, G. Galford, Y. Shimabukuro, (2012), 'Decoupling of deforestation and soy production in the southern Amazon during the late 2000s'. Proceedings of the National Academy of Sciences Jan 2012, 109 (4) 1341-1346. [Retrieved online from: https://www.pnas.org/content/109/4/1341?_cf_chl_jschl_tk__=68c87866ae4dfa3cdf8eb14546e7dd766f94e662-1614955897-0-ARGEKTJNoC1yqqdkWbqAJQKDKK3gQdnPru58nEnGjBsjtDL6L_G8BiUgRuCMYb0lk7-f7t9yOoJ7WAslv6vqzmzOtjbD17psmTtOHIZNI-9wNr-aZZrK8ir30DZfBqUh6CC6-RYYm9WDeK0ZvmDYE2Ql5g7rpmRj47CPzH4WNEKX7e_yQUA6944BU5C_AdxCGxrRVka4VcjM7CITx-SMllpuPQ_P5GqkRmCJYgR5ufr1hZgrKzWmvc8nS8hnRwyrpsmJ9kF5AyjaWxkB2Hs1qiDriKc8ZrY3kfsieclN4jWwrtSUU54fQbnG_NXkol-GV0JeT9GTzCsXfpdT76qknGCAoJ]

M. Macedo, R. DeFries, D. Morton, C. Stickler, G. Galford, Y. Shimabukuro, (2012), 'Decoupling of deforestation and soy production in the southern Amazon during the late 2000s'. Proceedings of the National Academy of Sciences Jan 2012, 109 (4) 1341-1346. [Retrieved online from: https://www.pnas.org/content/109/4/1341?_cf_chl_jschl_tk__=68c87866ae4dfa3cdf8eb14546e7dd766f94e662-1614955897-0-ARGEKTJNoC1yqqdkWbqAJQKDKK3gQdnPru58nEnGjBsjtDL6L_G8BiUgRuCMYb0lk7-f7t9yOoJ7WAslv6vqzmzOtjbD17psmTtOHIZNI-9wNr-aZZrK8ir30DZfBqUh6CC6-RYYm9WDeK0ZvmDYE2Ql5g7rpmRj47CPzH4WNEKX7e_yQUA6944BU5C_AdxCGxrRVka4VcjM7CITx-SMllpuPQ_P5GqkRmCJYgR5ufr1hZgrKzWmvc8nS8hnRwyrpsmJ9kF5AyjaWxkB2Hs1qiDriKc8ZrY3kfsieclN4jWwrtSUU54fQbnG_NXkol-GV0JeT9GTzCsXfpdT76qknGCAoJ]

WWF, (2014), 'The Growth of Soy: Impacts and Solutions'. WWF International, Gland, Switzerland.

and carbon sequestration . The biome is also the most extensive savanna ecosystem of South America and a biodiversity hotspot harboring a diverse range of flora with high levels of endemism .

For many years the Cerrado was considered too difficult to farm at scale, due to the high acidity of its soil and inaccessible terrain. Advances in agricultural technology in the 1970s enabled the development of new fertilizers and hardier crop varieties that suited Cerrado's climate and terrain and enabled the opening-up of a new agricultural frontier . Since then, the Cerrado has undergone a stark transition from a sparsely inhabited region made up of native dry forests, woodland savannas, and grasslands, to an agricultural powerhouse, home to extensive cattle and soy production .

Much of the agricultural growth in Cerrado came from farmers migrating from southern Brazil, who brought with them both the capital and agricultural expertise necessary for opening-up the savannah landscape of the Cerrado. Even so, the new farms in the Cerrado tended to have low yields during the initial years, but once the soils had been treated for several years and soybean and corn or cotton grown on rotation, many of these farms later achieved some of the highest yields in the country .

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- C. Silva, (2018), 'Between Fenix and Ceres: The Great Acceleration and the Agricultural Frontier in the Brazilian Cerrado'. *Varia Historia*, [online] 2018, vol.34, n.65. [Retrieved online from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-87752018000200409&lng=en&nrm=iso]. ISSN 1982-4343. <http://dx.doi.org/10.1590/0104-87752018000200006>.]
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- Report, 'Brazil's Latest Agriculture Frontier in Western Bahia and MATOPIBA' USDA, July 26, 2012. [Retrieved online from: https://ipad.fas.usda.gov/highlights/2012/07/Brazil_MATOPIBA/]



Figure 1: A map of the Cerrado and Matopiba. Matopiba is comprised of the states Maranhão, Tocantins, Piauí, and Bahia.

The center of agricultural production in Brazil rapidly shifted. By 2014, more than 50% of the Cerrado had been converted into pasture and agricultural lands . By 2015 only 13% of Brazil’s soybean production was harvested in the Amazon, while 48% came from the Cerrado , , which accounted for roughly 90% of agricultural activity in the biome .

In recent years the agricultural frontier of the Cerrado has moved to the Northeastern section of the biome; to the area commonly known as ‘Matopiba’, consisting of the states of Maranhão, Tocantins, Piauí and Bahia. The expansion of soy into Matopiba gained speed in the mid-1990s and the early 2000s. In the 14 years between 2000 and 2014, over two million hectares were deforested in the area for agricultural expansion, with over 60% of

Heilmayr, R., Rausch, L.L., Munger, J. et al. Brazil’s Amazon Soy Moratorium reduced deforestation. *Nat Food* 1, 801–810 (2020). <https://doi.org/10.1038/s43016-020-00194-5>

Dou, Y., da Silva, R.F.B., Yang, H. et al. Spillover effect offsets the conservation effort in the Amazon. *J. Geogr. Sci.* 28, 1715–1732 (2018). <https://doi.org/10.1007/s11442-018-1539-0>

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S. Spera, G. Galford, M. Coe, M. Macedo, J. Mustard, (2016). ‘Land-Use Change Affects Water Recycling in Brazil’s Last Agricultural Frontier’. *Global Change Biology*. [Retrieved online from: <https://onlinelibrary.wiley.com/doi/10.1111/gcb.13298>]

CEPF, Profile of the Cerrado Ecosystem Biodiversity Hotspot (2016); <http://legacy.cepf.net/SiteCollectionDocuments/cerrado/CerradoEcosystemProfile-EN.pdf>.

Franco, A.C., Rossatto, D.R., de Carvalho Ramos Silva, L. et al. Cerrado vegetation and global change: the role of functional types, resource availability and disturbance in regulating plant community responses to rising CO2 levels and climate warming. *Theor. Exp. Plant Physiol* 26, 19–38 (2014). <https://doi.org/10.1007/s40626-014-0002-6>

C. Silva, (2018), ‘Between Fenix and Ceres: The Great Acceleration and the Agricultural Frontier in the Brazilian Cerrado’. *Varia Historia*, [online] 2018, vol.34, n.65. [Retrieved online from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-87752018000200409&lng=en&nrm=iso]. ISSN 1982-4343. <http://dx.doi.org/10.1590/0104-87752018000200006>.]

agricultural expansion occurring over native vegetation , , . Between 2000 and 2017, the area under soybean cultivation increased by 370% , causing major habitat losses for plant and animal endangered species and leading to the release of 210 million tonnes of carbon dioxide equivalent emissions .

Figure 2 maps the recorded instances of deforestation in the Cerrado between 2000-2019 with the earlier instances of deforestation in yellow and the later shifting toward darker red. During this period deforestation from the

south-west of the Cerrado, towards the north-east area of Matopiba.

Recognizing the region’s strategic importance to Brazilian agribusiness, in 2015, government created the Presidential Decree No. 8447 on May 6, 2015 to establish an Agricultural Development Plan for Matopiba, seeking to guide federal projects and actions specifically for the region , all but securing the leading role that Matopiba would play in the future development of the agricultural sector.

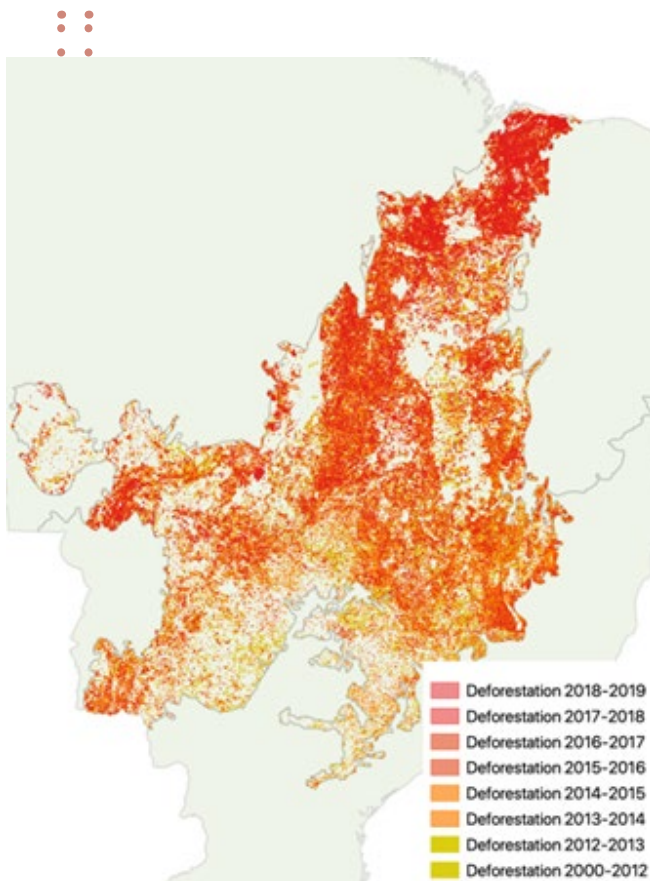


Figure 2: Annual increases in clear-cut deforestation detected by PRODES-Cerrado 2000-2019. Data source: National Institute for Space Research (INPE). Map: author’s own

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Commitments to reduce soy driven deforestation

Since 2015, multiple social movements have coalesced around the defense of the Cerrado. Partnerships of Brazilian movements with international human rights organizations have also yielded fact-finding missions and a collective report on the human and environmental costs of land investments in Matopiba. International environmental NGOs have also increased their attention to the Cerrado, calling upon traders and retailers to commit to stop purchasing commodities from deforested areas of the Cerrado.

As one of the most relevant producer and exporter of soy and beef in the world, Brazil has a significant share of its international commodities market committed to “deforestation-free” or “Zero Deforestation” supply chain with roughly between 50% and 57% of Brazil’s soy trade covered by some type of zero-deforestation commitment. However, these measures have largely focused on the Amazon, and while industry measures had led to reasonable success in the Amazon, they have not proven to be adequate in preventing the conversion of native vegetation in the Cerrado.

The Amazon Soy Moratorium

The Amazon Soy Moratorium is an important example. It was created in 2006 with the aim of blocking the purchase of soy cultivated in nearly deforested areas. This market-based mechanism was created after the successful pressure of NGOs and consumers, resulting in retailers in Europe demanding traders in Brazil to supply them only with soy free of Amazon deforestation.

Cerrado is not included in the Soy Moratorium and there have been many calls to expand the Soy Moratorium to include the Cerrado biome. Indeed, as mentioned above, much of the original soy expansion in the Cerrado has been attributed to the success of the Amazon Soy Moratorium and the unintended spillover effect, leading to considerable loss of native vegetation.

The Cerrado Manifesto

The Cerrado Manifesto was an attempt to increase the protection afforded to native vegetation in the Amazon to the neighboring Cerrado. The manifesto itself is a pledge to halt forest loss associated with the agriculture business, particularly related to the soy and

FIAN International, Rede Social de Justiça e Direitos Humanos and CPT (2018). ‘The Human and Environmental Cost of Land Business – The Case of MATOPIBA, Brazil’. Heidelberg: FIAN International.

The Cerrado Manifesto, (2017). [Retrieved online from: https://d3nehc6yl9qzo4.cloudfront.net/downloads/cerradomanifesto_september2017_atualizadooutubro.pdf]

Deforestation in Brazilian Soy Supply Chain: market access risk from a growing share of sourcing commitments (2017) China Reaction Research. Washington, DC. United States of America.

In 2019, Brazil’s National Institute for Space Research (INPE) released data showing that deforestation had increased by 88% in June 2019 compared with the same period in the last year.

A. C. Soterroni, F. M. Ramos, A. Mosnier, J. Fargione, P. R. Andrade, L. Baumgarten, J. Pirker, M. Obersteiner, F. Kraxner, G. Câmara, A. X. Y. Carvalho, S. Polasky, (2019) Expanding the Soy Moratorium to Brazil’s Cerrado. *Sci. Adv.* 5, eaav7336.

beef supply chains . More than 70 companies have signed the Cerrado Manifesto, including large fast-food companies and supermarkets like McDonalds and Walmart. The manifesto sought the development of economic instruments for both the government and the private sector to provide incentives for producers to conserve areas of native vegetation, even when they are eligible for legal clearance under the Forest Code .

Statement of support (SoS) for the objectives of the Cerrado Manifesto

Initially signed in 2017 by 23 global companies, including Ahold Delhaize, Marks & Spencer, METRO, Tesco, McDonald's, Nando's, Unilever and Walmart launched the Statement of Support (SoS) for the Cerrado Manifesto – the SoS supports the objectives defined in the Cerrado Manifesto and signatories “commit to working with local and international stakeholders to halt deforestation and native vegetation loss in the Cerrado”. The Statement of Support for the Cerrado Manifesto is currently endorsed by approximately 160 global Fast Moving Consumer Goods (FMCG) companies and institutional investors .

The New York Declaration on Forests

The New York Declaration on Forests is a non-legally binding political declaration that grew out of dialogue among governments, companies, and civil society, at the Secretary General's Climate Summit in 2014. World leaders endorsed a global timeline to cut natural forest loss in half by 2020, and strive to end it by 2030

The Declaration also calls for restoring forests and croplands of an area larger than India. Meeting these goals would cut between 4.5 and 8.8 billion tons of carbon pollution every

year – about as much as the current emissions of the United States. The Declaration is endorsed by dozens of governments, 30, of the world's biggest companies, and more than 50, influential civil society and indigenous organizations .

Deforestation commitments by traders

Traders represent an important opportunity to reduce pressure on deforestation by promoting soy sustainability through establishing commitments to remove soy produced on recently deforested land from their supply chains. Traders who do not live up to their pledges to fulfill the market demand for zero-deforestation soy put their reputation and market at risk. Thus, soy producers involved in deforestation may lose access to clients and lucrative markets.

CJ Selecta, Caramuru and Imcopa have all already committed to zero deforestation in their respective supply chains. This could increase industry pressure on larger traders to increase their own environmental commitments . However, Cargill and Bunge, which together are responsible for roughly 23% of total soymeal exports from Brazil are unable to follow suit within the same timeframe. Bunge has committed to eliminate legal deforestation from all its supply chains by 2025, a commitment that they have had in place since 2015 . Cargill is the only leading soy trader to have signed the New York Declaration on Forests, but with a deviation from the original pledge of eliminating deforestation from the production of agricultural commodities no later than 2020 and instead, halving deforestation from production of agricultural commodities by 2020 and eliminating it by 2030 , .