PHOTO BY MAURA CAMPANILI

AGRICULTURE & LIVESTOCK

BRAZIL AND CLIMATE CHANGE

Brazil is one of the largest food producers in the world. It is also one of the countries with a greater capacity to increase agricultural production that could supply the future global demand for food. The growth in production of Brazilian agriculture & livestock presents risks for global warming. Depending on the public policies implemented and the degree of planning for the sector's expansion, it may also represent an opportunity for carbon sequestration and mitigation. For this opportunity to be realized, it is necessary to augment the efficiency of production and the logistical chain associated to the sector, the technological diffusion, the improvement of agricultural financing, and payment policies for environmental services.[1]

Thirty-eight percent of the Brazilian territory is given over to agriculture & livestock activities[2]. The country is one of the world's leading producers of soybeans and corn; the world's leading producer of orange, sugar, ethanol and chicken; and has the world's second largest cattle herd, with 189 million head[3], being the largest exporter of animal protein.

GREENHOUSE GAS EMISSIONS FROM AGRICULTURE & LIVESTOCK

Agriculture & livestock are responsible for a quarter of the Brazilian GDP, and 22% of the country's total GHG emissions. However, it should be noted that of the emissions stemming from land use, which leads the ranking (with 45% of emissions), 94% are associated with deforestation, degradation, or conversion of lands to rural activities[4].

The growth trend in the sector's emissions is driven mainly by the livestock sector. In 2015, 56% of the agriculture & livestock sector's emissions emanated from enteric fermentation, followed by agricultural emissions, caused primarily through the use of nitrogen fertilizers[5].

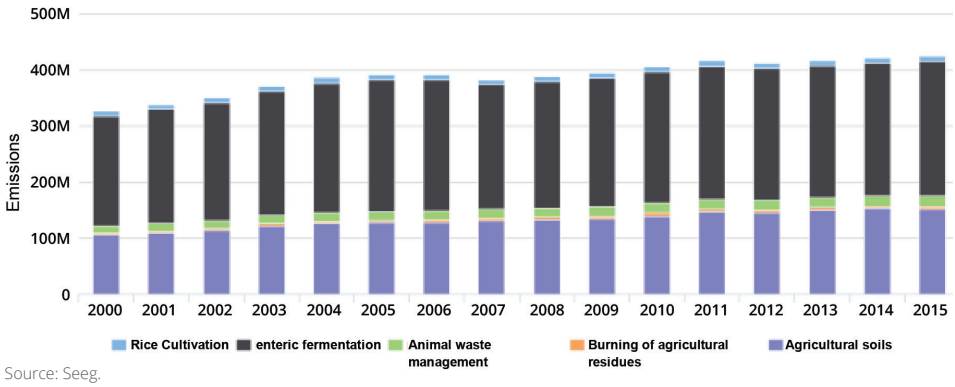
Degradation of pasture contributes to emissions from the livestock sector. It is estimated that between 50% and 70% of pasture areas have suffered some degree of degradation[6]. Livestock raising on degraded pasture produces up to 60% more GHG per kilogram of bovine carcass compared to production from pasture using the best agricultural practices.[7]

AGRICULTURAL EXPANSION IN THE AMAZON AND THE CERRADO

The final frontiers of agribusiness expansion in Brazil are the Amazon and the Cerrado. Although the rate of change in land use was reduced from 2005 to 2012 in the Amazon, from 19,000 km^2 to 4,500 km^2 per year, the National Institute of Space Research (INPE) estimates 7,989 km^2 of deforestation for 2017[8].

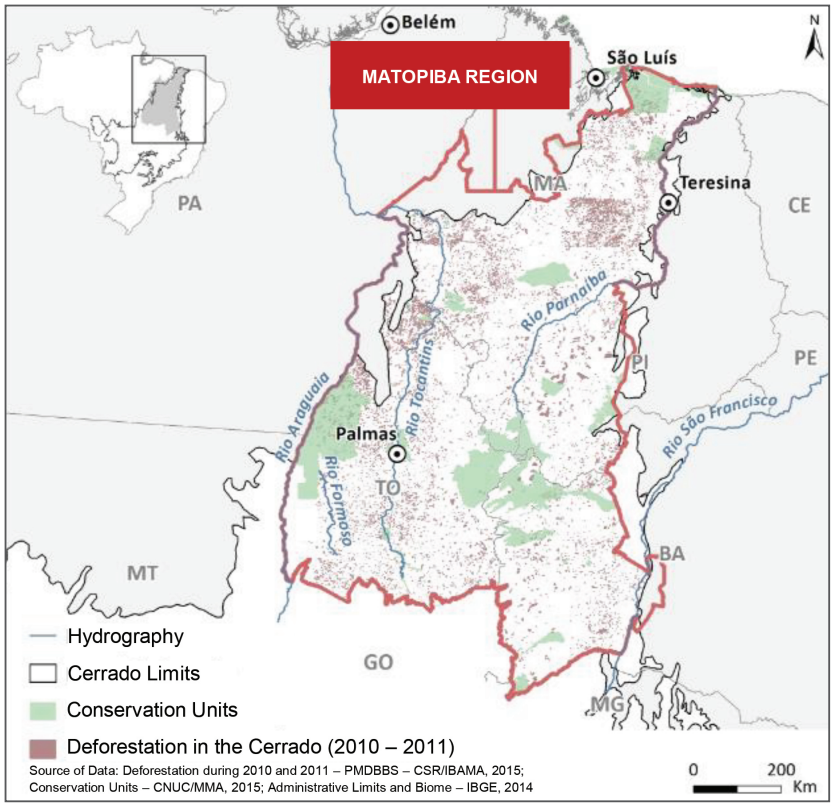
The Cerrado does not yet have a deforestation monitoring system like that of the Amazon, making annual analyses and command and control actions difficult. In the last 50 years,

HISTORICAL GHG EMISSIONS FROM THE AGRICULTURE & LIVESTOCK SECTOR FROM 2000 TO 2015.



Source: Seeg.

1. GHG Emissions from the Agricultural Sector, Executive Summary, Greenhouse Gas Emission Estimate System (Seeg), 2016.
2. Agriculture & Livestock Census, Brazilian Institute of Geography and Statistics (IBGE), 2006.
3. Agriculture & Livestock Census, IBGE, 2015.
4. Seeg, 2015.
5. Seeg, 2017.
6. Empresa Brasileira de Pesquisa Agropecuária (Embrapa).
7. Seeg, 2016.
8. Estimate published in November 2016.



almost 50% of the Cerrado's natural vegetation has been converted to agriculture & livestock use. The region known as Matopiba, an intersection of the states of Maranhão, Tocantins, Piauí and Bahia, is currently the area with the highest rates of land use change and accelerated expansion of agricultural areas.

The low implementation of land regularization policies in the Amazon and the Cerrado, the lack of instruments to promote sustainable agricultural activities on a large scale, such as technical assistance, rural extension and economic incentives, combine to retard the progress of sustainable agriculture.

LOW CARBON AGRICULTURE

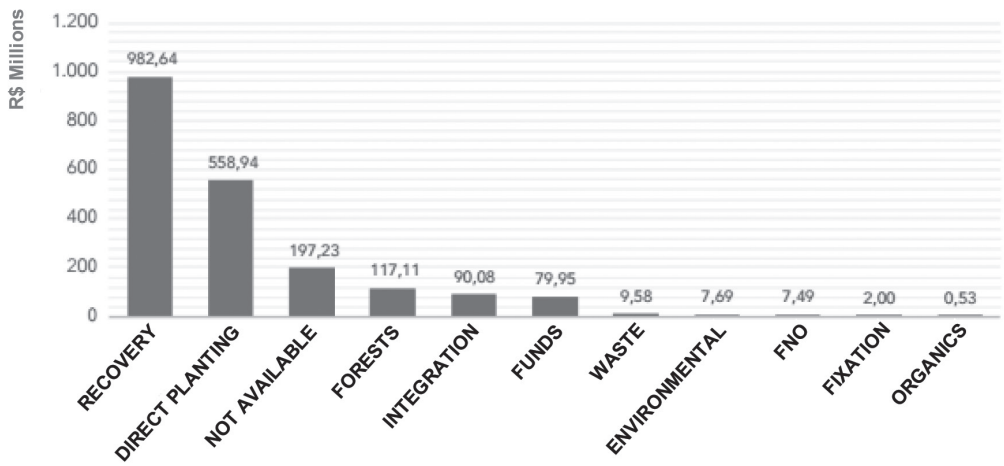
The Brazilian State has estimated that emissions from agriculture & livestock in the year 2025 would be in the order of 470 $MtCO_2e$[9], 11% higher than the estimated emissions for 2015, of 425 $MtCO_2e$[10]. The National Policy on Climate Change (NPCC), 2010, estimated the possibility of reducing emissions from the sector at between 144 to 173 $MtCO_2e$ by 2020[11], through the implementation of the Low Carbon Agriculture Plan (ABC[12] Plan).

The ABC Plan focus is to foster the recovery of degraded pastures, integration of crop-livestock-forest (iLPF) and agroforestry systems (SAF), among other low carbon agricultural technologies. A specific line of credit (ABC Program) was created within the *Plano Safra*[13] aimed at rural producers who desire to transition to new production technologies that emit less GHG. However, obstacles hamper the success of this program, such as bureaucracy combined with the lack of information on low-carbon agriculture and technical assistance in the field.

BRAZILIAN COMMITMENT

Given the importance of the agriculture & livestock sector for Brazilian emissions, the Brazilian State has specified additional actions supplementary to those provided in the ABC Plan, but these are not commitments. Among the additional actions indicated, some are related to the agriculture & livestock sector, such as restoring 15 million hectares of degraded pastures and increasing 5 million hectares of iLPF between 2020 and 2030. The incorporation of other actions and policies is still necessary for the sector's gross emissions to be reduced in the long term.

LOW CARBON AGRICULTURE PROGRAM: TOTAL CONTRACTED FOR INVESTMENTS IN SAFRA 2015/16



Source: Observatório ABC; Sicor

9. Fundamentals for the elaboration of the Brazilian Intended Nationally Determined Contribution (INDC) in the context of the Paris Agreement (MMA, 2016).

10. Greenhouse Gas Emission Estimate System (Seeg), 2017.

11. Decree No. 7.390, Brazil 2010.

12. ABC is the Brazilian acronym for low-carbon agriculture.

13. Safra Plan, which provided approximately 60 billion dollars in subsidized credit to farmers in 2017, is the Brazilian version of the Farm Bill and the major source of funding for agriculture in the country.

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