



Sector Profile: Brazil

Author: Franziska Haupt, Climate Focus

A. Overview

A leading producer and exporter for major commodities, Brazilian agriculture has to balance rising demand - global and domestic - with renewed pressure on land and natural resources (see Table 1). As the government projects production increases for all major commodities, sustainable intensification and land reclamation are key to continued productivity-based growth.

Farm production accounts for close to 6% of Brazilian GDP and a value of USD 122billion¹. Its contribution has been increasing at a rate of close to 4% per annum, primarily due to production increases and productivity gains.² The contribution of the agribusiness sector (i.e. including industries, distribution, research) is estimated at 22.6% of GDP, and the sector employs one fifth of labor.³ Fueled by increasing global demand, the export value of agricultural commodities has reached USD 81.7billion. Major buyers include the European Union (EU), China, the United States (US), Russia, Japan, Venezuela and several Middle Eastern countries.⁴ The share of surplus production available for export has been declining in recent years as domestic diets shift towards meat-based diets.⁵

Products	Production	Exports	% Exported production
Sugar	1	1	66.6
Coffee	1	1	58.9
Orange Juice	1	1	84.0
Soybean grains	2	1	52.7
Beef	2	2	14.9
Chicken meat	3	1	25.5
Soybean oil	4	2	23.5
Soybean meal	4	2	52.1
Corn	4	4	13.9
Pork	4	4	17.3

Table 1: Major export commodities and Brazil's position in world production and exports, and share of exported production.⁶

¹ United States International Trade Commission. *Brazil: Competitive Factors in Brazil Affecting U.S. and Brazilian Agricultural Sales in Selected Third Country Markets, Investigation No. 332-524, Publication 4310*. United States International Trade Commission, 2012.

² Ministério da Agricultura, Pecuária e Abastecimento. *Projeções do Agronegócio: Brasil 2012/2013 a 2022/2023*. Brasília: Ministério da Agricultura, Pecuária e Abastecimento (MAPA), 2013.

³ Ibid.

⁴ ¹United States International Trade Commission. *Brazil: Competitive Factors in Brazil Affecting U.S. and Brazilian Agricultural Sales in Selected Third Country Markets, Investigation No. 332-524, Publication 4310*. United States International Trade Commission, 2012.

⁵ Ibid.

⁶ Ministério da Agricultura, Pecuária e Abastecimento. *Projeções do Agronegócio: Brasil 2012/2013 a 2022/2023*. Brasília: Ministério da Agricultura, Pecuária e Abastecimento, 2013.



Rapid agricultural development in Brazil has been based on productivity gains and to a lesser extent on area expansion⁷. Within a relative short timeframe, from 2005/06 to 2010/11, crop productivity increased by 27.5%. Recent area expansions were largely for soy and corn production, increasing by 1.9 and 1.6 million hectares (ha), respectively, and accompanied by a reduction in area cultivated for other grains. Expansion was particularly large for sugar cane production, at 30% or 1.9 million ha.

In the latest agricultural outlook report for 2012/13 to 2022/23⁸, the government projects large and continuing increases in production for all major commodities. Meat production (beef, pork and poultry) is projected to increase by 34.9% during the next ten years.⁹ In the first half of 2013 exports of beef already reached record levels¹⁰, despite the increase of domestic demand and reoriented marketing strategies of large companies¹¹. The government forecasts continuing growth that is mostly, but not completely, based on productivity gains. Yet agricultural area is still projected to expand at a range of 8% to 21%. Similarly, the US International Trade Commission¹² expects continuing growth based on high technological potential for agricultural intensification and land reclamation. During the last couple of years, the country achieved a remarkable reduction in deforestation attributed to low commodity prices and successful policies, among other factors¹³.

Farming systems in Brazil are highly heterogeneous in size, input, modernization, income etc. About half of the 5 million farms in Brazil are small-scale and operated by families, while the bulk of commercial output comes from 1.6 million large-scale farms and cooperatives concentrated in the *Cerrado* region (a 'Savannah' area covering one quarter of the total land area), the South and the South-East.¹⁴ The government also sees potential for an expansion of commercial agriculture in several Eastern states. Smaller and medium-size commercial producers are mostly located in the South and South-East of Brazil, many of them operating in cooperatives. In the North, agriculture is mostly small-scale and focused on regional food production.¹⁵

⁷ Ministério da Agricultura, Pecuária e Abastecimento. Brazilian. *Agricultural Foreign Trade: Main Markets and Products*. Brasília: Ministério da Agricultura, Pecuária e Abastecimento, 2012;

⁸ Ministério da Agricultura, Pecuária e Abastecimento. *Projeções do Agronegócio: Brasil 2012/2013 a 2022/2023*. Brasília: Ministério da Agricultura, Pecuária e Abastecimento, 2013.

⁹ Beef Central. "Brazil exports hit record levels in first half." 17 July 2013. Available at: <http://www.beefcentral.com/p/news/article/3407>.

¹⁰ Ibid.

¹¹ United States International Trade Commission. *Brazil: Competitive Factors in Brazil Affecting U.S. and Brazilian Agricultural Sales in Selected Third Country Markets, Investigation No. 332-524, Publication 4310*. United States International Trade Commission, 2012.

¹² Ibid.

¹³ Galford, G., Soares-Filho, B. and Cerri, C. "Prospects for land-use sustainability on the agricultural frontier of the Brazilian Amazon." *Philosophical Transactions of the Royal Society B* 368, 2012.

¹⁴ United States International Trade Commission. *Brazil: Competitive Factors in Brazil Affecting U.S. and Brazilian Agricultural Sales in Selected Third Country Markets, Investigation No. 332-524, Publication 4310*. United States International Trade Commission, 2012.

¹⁵ Presidency of the Federative Republic of Brazil. *Agriculture and Livestock: Brazil Insights Series*. Presidency of the Federative Republic of Brazil, 2013.



Figure 1: Map of Brazilian states and regions.¹⁶

Pasture-based beef production. At roughly 200 million head of cattle and more than 31 million slaughtered animals per year, Brazil is home to the largest commercial cattle herd in the world; about one quarter of which is used for milk production.¹⁷ The majority of animals are grass-fed and raised in extensive pastures, concentrated in the Center and the Southeastern regions. The sector's abundant availability of land combined with large government investments into the beef industry leading to increasing horizontal concentration – the bulk of beef is processed and sold by a few companies – has allowed it to become the second largest producer in the world.

¹⁶ United States International Trade Commission. *Brazil: Competitive Factors in Brazil Affecting U.S. and Brazilian Agricultural Sales in Selected Third Country Markets, Investigation No. 332-524, Publication 4310*. United States International Trade Commission, 2012.

¹⁷ Bowman, M.S., Soares-Filho, B.S., Merry, F.D., Nepstad, D.C., Rodrigues, H. and Almeida, O.T. "Persistence of cattle ranching in the Brazilian Amazon: A spatial analysis of the rationale for beef production" *Land Use Policy* 29, 2012: 558-568.



The average stocking density of cattle is relatively low at 1.08 animals per ha¹⁸. Despite significant efficiency gains in some areas, beef production is still characterized by insufficient investments (e.g. in reseeding, rotation, fertilization), and marginal and diminishing productivity.¹⁹ Due to either poor or completely absent management, a large share of pastures is degraded. Symptoms include erosion, low fertility, weeds, pests and diseases, and other environmental problems.²⁰ Investment in productivity is impaired by several obstacles that vary geographically and across various types of farmers, including lack of awareness and entrepreneurial understanding, cultural factors, high investment costs and associated risks, and problems related to land tenure. Due to relatively low efficiency and profitability, pastures are increasingly being displaced from areas with potential for more profitable cash crops and large-scale mechanized production.²¹

The sector is heterogeneous and can be very roughly divided into three groups: (1) Large-scale, modernized, and relatively efficient systems; (2) medium-scale systems, e.g. remote urban farmers that keep large, low-input cattle herds for cultural reasons but are barely involved in management, showing less interest in productivity, profitability, or sustainability concerns; and (3) small-scale and family enterprises. In remote areas of the Amazon, for instance, this system is often characterized by low productivity and due to few alternative livelihood opportunities farmers rely on deforestation and land speculation. Many small-scale cattle farmers, if not organized in cooperatives, generally have limited access to information on productivity and environmental concerns.

¹⁸ Santana, C.A.M., Valdes, C. Bastos, E.T., Alves, E., Martha Junior, G.B. et al. *Brazilian agriculture development and changes*. Brasília: EMBRAPA, 2012.

¹⁹United States International Trade Commission. *Brazil: Competitive Factors in Brazil Affecting U.S. and Brazilian Agricultural Sales in Selected Third Country Markets, Investigation No. 332-524, Publication 4310*. United States International Trade Commission, 2012; for the Amazon, see Bowman, M.S., Soares-Filho, B.S., Merry, F.D., Nepstad, D.C., Rodrigues, H. and Almeida, O.T. "Persistence of cattle ranching in the Brazilian Amazon: A spatial analysis of the rationale for beef production." *Land Use Policy* 29, 2012: 558-568; Landers, J. *Tropical Crop-Livestock Systems in Conservation Agriculture: The Brazilian Experience*. Food and Agriculture Organisation of the United Nations, 2007.

²⁰ Euclides, V.P.B., do Valle, C.B., Macedo, M.C.M., Almeida, R.G. de, Montagner, D.B., and Barbosa, R.A. "Brazilian scientific progress in pasture research during the first decade of XXI century." *Revista Brasileira de Zootecnia* 39, 2012: 151–168; United States International Trade Commission. *Brazil: Competitive Factors in Brazil Affecting U.S. and Brazilian Agricultural Sales in Selected Third Country Markets, Investigation No. 332-524, Publication 4310*. United States International Trade Commission, 2012.

²¹ Arima, E., Richards, P., Walker, R. and Caldas, M. "Statistical confirmation of indirect land use change in the Brazilian Amazon." *Environmental Research Letters* 6, 2011; Bowman, M.S., Soares-Filho, B.S., Merry, F.D., Nepstad, D.C., Rodrigues, H. and Almeida, O.T. "Persistence of cattle ranching in the Brazilian Amazon: A spatial analysis of the rationale for beef production." *Land Use Policy* 29, 2012: 558-568.

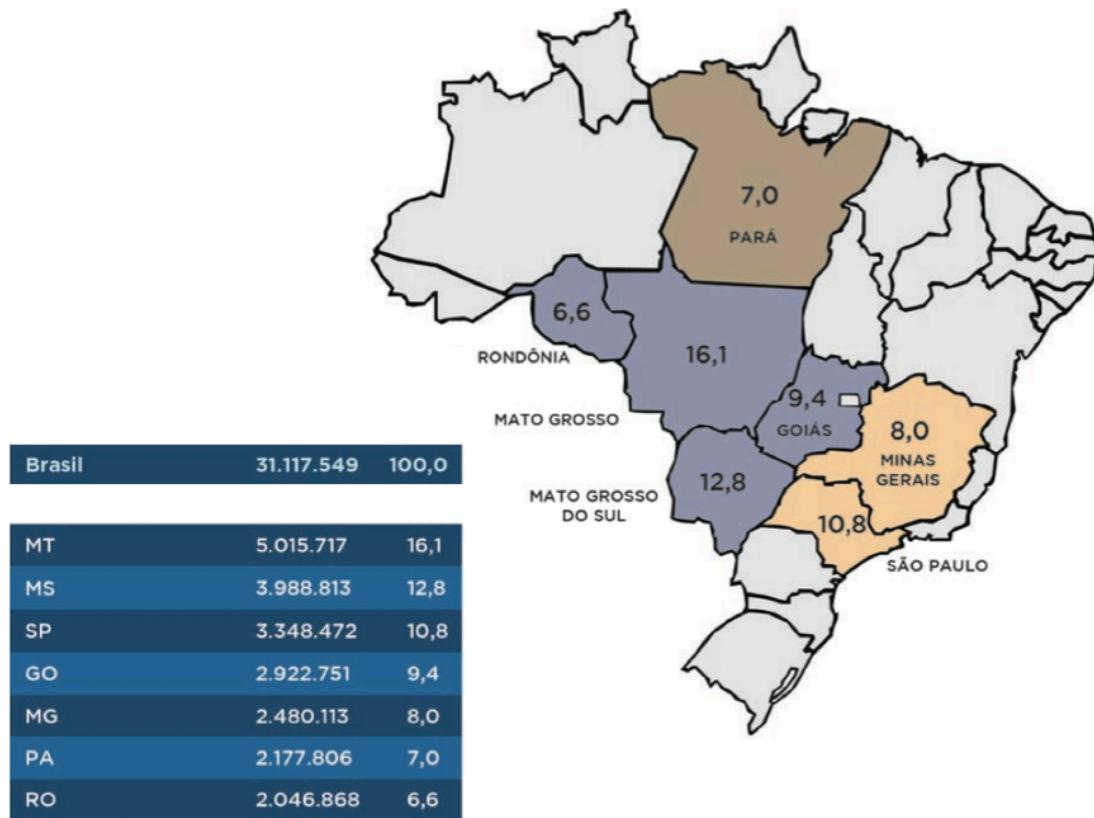


Figure 2: Cattle production in Brazil for major states, number and share of slaughtered animals.²²

Cash crops form the backbone of Brazilian agriculture²³; particularly soy, corn, and sugar cane, which account for the majority of production value in major agricultural regions (see Figure 3). Crop production by value is concentrated in the *Cerrado*, often in so-called “megafarms”. Crop production in the South and South-Eastern region consists mostly of smaller-scale farms organized in cooperatives. Farming systems for commercial markets are generally characterized by the following developments and influences:²⁴

- Low production costs due to high efficiency, mechanization, and economies of scale.
- Relatively high costs for fertilizer and other chemical inputs due to poor soils.
- Continuing yield improvements due to technological innovation (e.g. new varieties, integrated systems).
- Relatively high costs for transportation due to infrastructure constraints, off-setting the competitive advantage of low production costs.
- High levels of vertical and horizontal consolidation.

²² Ministério da Agricultura, Pecuária e Abastecimento. *Projeções do Agronegócio: Brasil 2012/2013 a 2022/2023*. Brasília: Ministério da Agricultura, Pecuária e Abastecimento, 2013.

²³ United States International Trade Commission. *Brazil: Competitive Factors in Brazil Affecting U.S. and Brazilian Agricultural Sales in Selected Third Country Markets, Investigation No. 332-524, Publication 4310*. United States International Trade Commission, 2012.

²⁴ Ibid.

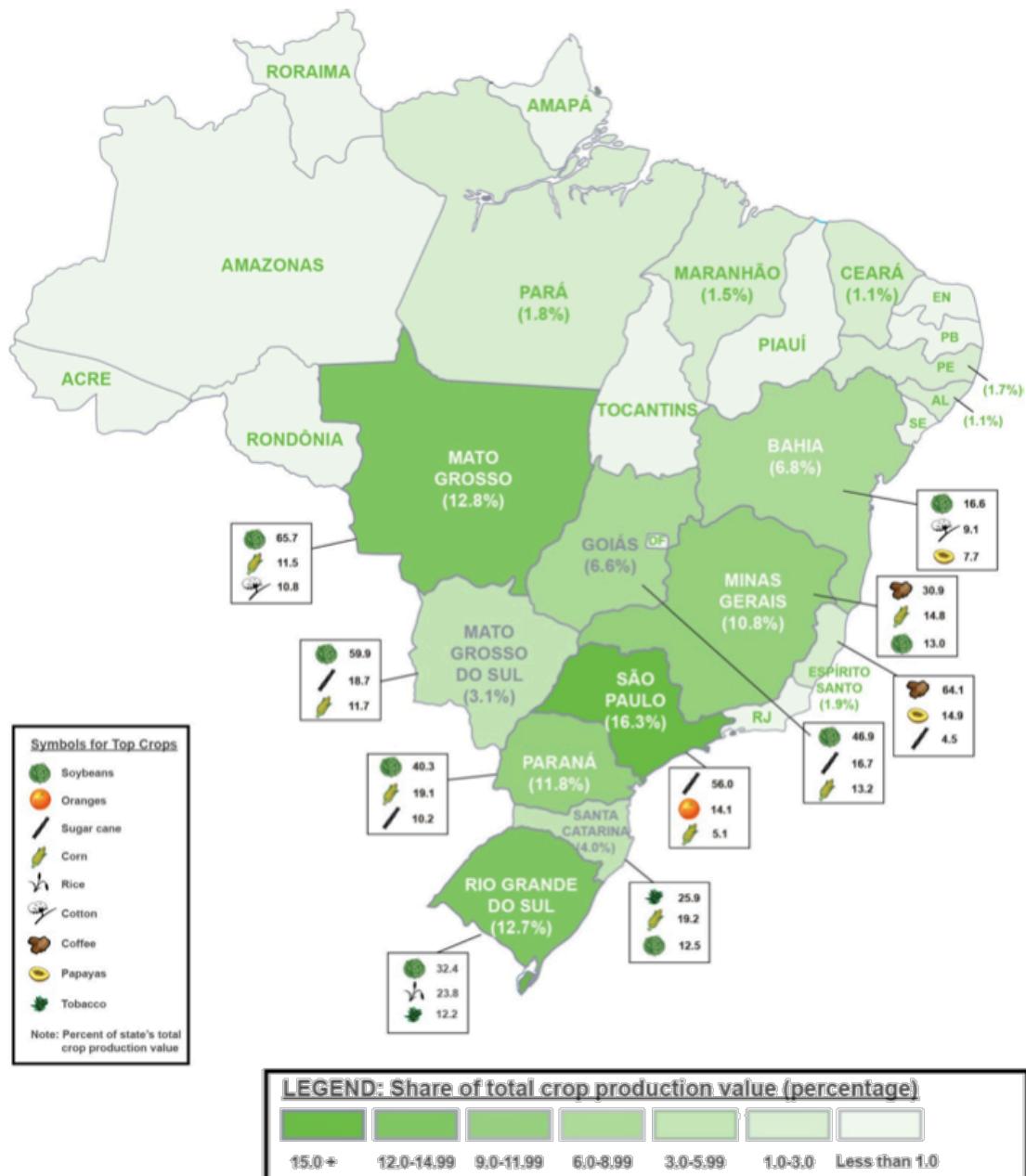


Figure 3: Major cash crops, regional production patterns and share of state production.²⁵

²⁵ Ibid.



B. Major influences and trends

Technological innovation and modernization. Heavy investments in R&D and the Brazilian Corporation for Agricultural Research (EMBRAPA) established a showcase for tropical agriculture, in particular through transformation of the once-infertile *Cerrado* into one of the most productive agricultural regions in the world. Despite prevailing challenges to agricultural development such as insufficient infrastructure, high interest rates, burdensome tax requirements, and lack of insurance, Brazil has emerged as a leading supplier of agricultural commodities. This rapid growth is due mainly to productivity gains in large-scale commercial operations and cooperatives²⁶. The driving force behind technological innovations has been the Brazilian Corporation for Agricultural Research (EMBRAPA), through the development of high-yielding, better adapted varieties and the promotion of improved practices for land management and reclamation, such as liming, fertilization, nitrogen fixation, conservation agriculture and most recently an integrated livestock-forestry-crop system²⁷.

Rising on-farm production costs. As competition for cash crop production in key agricultural regions is increasing, high costs for land and labor are increasingly displacing low-profitable production system, such as extensive cattle ranching. This in turn drives cattle ranchers to find new land, and while degraded pastures with potential for reclamation are abundant, costs for their reclamation are prohibitive for cattle farmers. Instead, ranchers find cheaper, water-abundant forestland for pasture, albeit at a higher environmental cost. Labor costs have also been increasing due to economic growth, inflation, more stringent labor regulations, and increasing labor scarcity for skilled workers. Between 2007 and 2011, the minimum wage more than quadrupled. Consequently, large-scale and commercial farms rely more heavily on mechanization.²⁸

Weak law enforcement and prevailing loopholes, though improving, constitute major limitations for the sustainability of the sector. Farmers and private companies often lack incentives to comply with regulations; especially environmental, labor and land tenure regulations. In remote areas land grabbing and speculation are still widespread, and at the state-level environmental agencies often lack the capacity for monitoring and enforcement²⁹.

²⁶ “Brazilian Agriculture: The miracle of the cerrado.” *The Economist*. 2010. Available at:

<http://www.economist.com/node/16886442>; Santana, C.A.M., Valdes, C. Bastos, E.T., Alves, E., Martha Junior, G.B. et al. *Brazilian agriculture development and changes*. Brasília: EMBRAPA, 2012.

²⁷ Santana, C.A.M., Valdes, C. Bastos, E.T., Alves, E., Martha Junior, G.B. et al. *Brazilian agriculture development and changes*. Brasília: EMBRAPA, 2012; Pereira, P., Martha, G., Santana, C. and Alves, E. “The development of Brazilian agriculture: future technological challenges and opportunities.” *Agriculture and Food Security* 1, 2012

²⁸ United States International Trade Commission. *Brazil: Competitive Factors in Brazil Affecting U.S. and Brazilian Agricultural Sales in Selected Third Country Markets, Investigation No. 332-524, Publication 4310*.

United States International Trade Commission, 2012.

²⁹ Ibid.

**Box 1: Zero-tillage as an example of successful technology adoption**

The widespread adoption of zero-tillage (53%; Galford et al. 2013) has been hailed as the “most important agricultural technology adopted in Brazil in the last 50 years” (Ekboir 2003). The successful uptake of this complex technology was supported in part by: (1) The reduction in price of a herbicide (Roundup) from an agrochemical company seeking to develop a new market, i.e. a so-called supply push. Up to this point labor-intensive weeding had been a major bottleneck for zero-tillage, (2) urgent soil management and erosion problems of commercial farms, and (3) significant economic benefits of zero-tillage through saved machinery and labor input. This example shows that a complex technology with simultaneous economic and environmental benefits can be adopted due to a combination of economic incentives, technical capacity building and research.

Sources: Galford, G., Soares-Filho, B. and Cerri, C. “Prospects for land-use sustainability on the agricultural frontier of the Brazilian Amazon.” *Philosophical Transactions of the Royal Society B* 368, 2012; Ekboir, J. “Research and technology policies in innovation systems: zero tillage in Brazil” *Research Policy* 32, 2003. 573–586

C. Agricultural policies

C.1 Overview

The government’s policy objectives for the agricultural sector are competitiveness, sustainability and globalization. During the last decade the government’s priorities have shifted away from direct interventions (e.g. government purchases) to a market-driven economy based on promotion and support for agricultural R&D and private sector involvement (e.g. preferential lending).³⁰ The Agriculture Ministry (MAPA) and the Ministry of Agrarian Development (MDA) are the major actors in Brazilian agriculture policy. Both ministries’ budget allocations have been increasing, and accounted for 0.8 percent of Brazil’s total budget in 2010, which has been attributed to a renewed attention on agriculture.³¹ MAPA is mostly responsible for commercial agriculture and agribusiness. In 2006, MAPA adopted a strategic plan for agricultural policy, which includes medium-term policy plans (PPA), an environmental agenda, the annual agriculture and livestock plans (PAP), and annual long-term outlooks, the most recent of which projects sector development from 2012/13 to 2022/23³². The PPA of 2008-2011 defined the following policy objectives: sustainable development through agribusiness, increasing non-food and non-energy agricultural production, supporting food security and increasing biofuels³³. The MDA administers policies supporting small-scale and family farms, with a focus on their sustainable development and land reform. The Ministry’s Department of Family Farming manages rural credit (PRONAF), infrastructure and municipal services, extension services and technical assistance, research, training, and market integration.³⁴

Brazil has been increasing its level of public spending for agriculture, in particular their general services for extension and advisory services, but at \$10 billion, subsidies are low relative to its

³⁰ United States International Trade Commission. *Brazil: Competitive Factors in Brazil Affecting U.S. and Brazilian Agricultural Sales in Selected Third Country Markets, Investigation No. 332-524, Publication 4310*. United States International Trade Commission, 2012.

³¹ Ibid.

³² Ministério da Agricultura, Pecuária e Abastecimento. *Projeções do Agronegócio: Brasil 2012/2013 a 2022/2023*. Brasília: Ministério da Agricultura, Pecuária e Abastecimento, 2013.

³³ United States International Trade Commission. *Brazil: Competitive Factors in Brazil Affecting U.S. and Brazilian Agricultural Sales in Selected Third Country Markets, Investigation No. 332-524, Publication 4310*. United States International Trade Commission, 2012.

³⁴ Ibid.



agricultural GDP (close to 8% for farm production³⁵) and the spending of developed or emerging economies (e.g. in the EU, the US, and China³⁶). Trade distorting subsidies are within the limits of the WTO clause for support to low-income and resource-poor producers. The OECD also noted that the country increasingly includes environmental and sustainability criteria in its support programs³⁷. Specific policies for public support are outlined in the Agriculture and Livestock Plan.

C.2 Agricultural policies, plans and programs

The Agriculture and Livestock Plan (PAP) for 2013-14 announced in June 2013 sets a record commitment of USD 64billion³⁸ in governmental support and investment³⁹. For programs supporting sustainable production, the plan refers to the ABC Plan (see below). The majority of funding (72%) is targeted at “cost and marketing,” while investment programs receive the remaining share. The majority of finance is provided at an interest rate of 5.5% or lower for certain activities. Specifically for sustainable practices the PAP 2013/14 reduced the interest rate to 5%. The plan of 2012/13 announced a renewed credit line for the purchase of breeding cattle and buffaloes. Government programs provide about 40% of agricultural capital (working and investment) at favorable rates, while the majority of finance comes from private sources, such as input suppliers and purchasers at relatively high domestic rates⁴⁰. Credit programs are channeled through the National Rural Credit System (SCNR) including various banks and cooperatives at national and sub-national level. In addition, the BNDES maintains separate agricultural credit programs. In the sustainability and mitigation context, important programs include PRODUSA (support for planting on unproductive, degraded soils) and MODERAGRO.

Specific programs for price support include minimum price levels for corn, rice and wheat, determined for specific crops and states, mainly to balance regional supply and demand. The tax system is considered a major obstacle for agricultural investments, causing significant administrative and economic costs. There are, however, full or partial tax exemptions related to exports, inputs for manufacturing of exported products, animal feed and meat production, and cooperatives.⁴¹

³⁵ Calculated based on United States International Trade Commission. *Brazil: Competitive Factors in Brazil Affecting U.S. and Brazilian Agricultural Sales in Selected Third Country Markets, Investigation No. 332-524, Publication 4310*. United States International Trade Commission, 2012.

³⁶ International Centre for Trade and Sustainable Development. “Brasilia: Farm Subsidy Growth Not Distorting Trade.” *Bridges Weekly Trade News Digest* 17, 2013; International Centre for Trade and Sustainable Development. „US: Farm Support Still Low, Despite Record Food Stamp Payments.“ *Bridges Weekly Trade News Digest* 16, 2013; International Centre for Trade and Sustainable Development. “Trade-distorting Farm Payments Fall to New Low, EU says.” *Bridges Weekly Trade News Digest* 16, 2013; Organisation for Economic Cooperation and Development. *Agricultural Policy Monitoring and Evaluation 2012: OECD Countries and Emerging Economies*. Paris: Organisation for Economic Cooperation and Development Publishing, 2012.

³⁷ Organisation for Economic Cooperation and Development. *Agricultural Policy Monitoring and Evaluation 2012: OECD Countries and Emerging Economies*. Paris: Organisation for Economic Cooperation and Development Publishing, 2012.

³⁸ Exchange rate as of June 04, 2013

³⁹ Ministério da Agricultura, Pecuária e Abastecimento. “Novo Plano Agrícola disponibilizará R\$ 136 bilhões para safra 2013/14” Press release published June 04, 2013.

⁴⁰ United States International Trade Commission. *Brazil: Competitive Factors in Brazil Affecting U.S. and Brazilian Agricultural Sales in Selected Third Country Markets, Investigation No. 332-524, Publication 4310*. United States International Trade Commission, 2012.

⁴¹ Ibid.



C.3 Climate change policies

Since adopting the National Plan on Climate Change in 2009, the government has had a high profile in international climate change policy, particularly in the context of reducing deforestation. Brazil is one of the few countries with advanced policies for mitigation in the agriculture sector. It has adopted voluntary commitments, including for example commitments for activities related to the sustainable intensification of beef production such as 'recovery of degraded pastures' and 'integrated livestock-crop-forestry systems'. At the climate change conference in Copenhagen in 2009, the government announced voluntary targets for emission reductions and presented a proposal for Nationally Appropriate Mitigation Actions (NAMAs) in the agriculture sector. The government also adopted voluntary targets for reducing deforestation by 80% in the Amazon and by 40% in the *Cerrado*. While national climate change policies include agricultural mitigation components, the strategic alignment at the federal level varies. Out of 25 states that have adopted state-level climate change policies, only six states explicitly promote low-carbon agriculture.

The National Plan outlines the following options for low-carbon agriculture, providing preliminary estimates of mitigation potentials for each option:

- Pasture recovery (with a commitment of 15 million ha within one decade),
- Crop-livestock-forestry integration system (4 million ha),
- No-till agriculture (8 million ha),
- Biological nitrogen fixation (5.5 million ha),
- Planted forests (3 million ha) and
- Treatment of animal residues (4.4 million cubic meters).

The program⁴² for low-carbon agriculture (*Agricultura de Baixa Emissão de Carbono*, ABC), a federal credit and capacity building initiative established in 2010, supports the implementation of mitigation options. Farmers investing in mitigation options while complying with certain environmental requirements have access to credits at low interest rates (5%) and a prolonged repayment period. The program encompasses a wide range of practices aimed at sustainable intensification in the cattle sector. So far, the bulk of funding (roughly 80% in 2012/13) went to 'recovery of degraded pastures', which contributes to the increase of soil carbon stocks, avoids further losses from erosion and can free up land for other uses. It also introduces new grass species and implements pasture rotation, which can contribute to animal productivity⁴³. During a relatively short timespan the ABC program has achieved considerable progress. By April 2013 the program reached disbursements of USD 2.3 billion⁴⁴ – this however competes with USD 64 billion⁴⁵ in support and investment for the agriculture and livestock sectors with no specific sustainability requirements at similar or slightly higher interest rates. Major limitations of ABC include the low loan share that can be allocated to technical assistance as well as the requirement for farmers to register with a relatively new Rural Environmental Registry (CAR) that is not yet operational in some states⁴⁶.

⁴² The ABC plan has not been officially adopted (by April 2013) but the plan's activities been implemented by the ABC program. See: Gebara, M.F. and Thauault, A. "GHG Mitigation in Brazil's Land Use Sector: An Introduction to the Current National Policy Landscape." Working Paper. Washington, DC: *World Resources Institute*, 2013.

⁴³ ABC Observatório. *Low Carbon Agriculture: The Evolution of a new paradigm*. ABC Observatório, 2013.

⁴⁴ Ministério da Agricultura, Pecuária e Abastecimento. "Contratos pelo Programa ABC chegam a 80%." Press release published 28 June 2013.

⁴⁵ Ministério da Agricultura, Pecuária e Abastecimento. "Novo Plano Agrícola disponibilizará R\$ 136 bilhões para safra 2013/14." Press release published 04 June 2013.

⁴⁶ Gebara, M.F. and Thauault, A. "GHG Mitigation in Brazil's Land Use Sector: An Introduction to the Current National Policy Landscape." Working Paper. Washington, DC: *World Resources Institute*, 2013.



The Forest Code, despite weak enforcement, has played an important role in the successful reduction of deforestation in the last decade, accompanied by measures such as a loan veto by the Bank of Brazil for farmers not complying with the Forest Code as well as a requirement for farmers to geo-reference remaining forests⁴⁷. According to WWF UK⁴⁸ these relatively strict measures prompted the Rural Caucus (*Ruralistas*), a strong, cross-party farming lobby, to pursue revision. As a result, the new Forest Code approved in 2012 and currently adopted at the federal state level has been criticized. It includes the following requirements.⁴⁹

- Farmers are required to preserve a certain - now significantly reduced - share of forests, riverbanks, mangrove swamps, hilltops and biodiverse areas, depending on the region (e.g. in some areas of the Amazon, the required forest reserve share dropped from 80% to 50%).
- Farmers are required to compensate for illegal deforestation through reforestation within 5 years or they face prosecution, fines and denial of loans. A new amnesty clause, however, provides exemption for illegal deforestation before July 2008.
- Farmers have to register their operations with a new Rural Environmental Registry (*Cadastro Ambiental Rural*, CAR), a decentralized mapping (i.e. boundaries) and geo-referenced registration system within 2 years (see Table below).

Other important programs focusing on deforestation include⁵⁰:

Program	Description
Terms of Conduct Adjustments	The Public Ministry and several State Prosecutors Offices have established binding agreements (Terms of Conduct Adjustment; TAC) with slaughterhouses, processors and retailers to source meat only from deforestation-free suppliers. Companies not complying with their TAC face legal action and fines. Notably, the Brazilian Association of Supermarkets encourages their members to enter TACs. The program has been very effective.
Rural Environmental Registry	The CAR, a decentralized system for geo-referenced registration of rural properties. Eventually the system should enable the detection of deforestation at a farm level. Currently, there are still some methodological uncertainties and controversies, but the program is implemented at the state level and presents an important first step towards monitoring and tracking of sustainability concerns.
Blacklists of municipalities	Blacklists of municipalities and companies involved in illegal deforestation or violations of labor and indigenous rights, which has already served as a strong incentive for municipalities to improve social and environmental practices, e.g. in Paragominas.
Environmental Regularization Program	The Environmental Regularization Program (PRA) promote compliance with environmental regulations, not yet approved at the federal level.

⁴⁷ United States International Trade Commission. *Brazil: Competitive Factors in Brazil Affecting U.S. and Brazilian Agricultural Sales in Selected Third Country Markets*, Investigation No. 332-524, Publication 4310. United States International Trade Commission, 2012; Galford, G., Soares-Filho, B. and Cerri, C. "Prospects for land-use sustainability on the agricultural frontier of the Brazilian Amazon." *Philosophical Transactions of the Royal Society B* 368, 2012; and others.

⁴⁸ Ministério da Agricultura, Pecuária e Abastecimento (MAPA). *Projeções do Agronegócio: Brasil 2012/2013 a 2022/2023*. Brasília: Ministério da Agricultura, Pecuária e Abastecimento, 2013.

⁴⁹ "The hidden reality in Dilma's Forest Code 'veto.'" *Greenpeace International*. 1 June 2012. Available at: <http://www.greenpeace.org/international/en/news/features/The-hidden-reality-in-Dilmas-Forest-Code-veto/>; WWF UK. *The new Brazilian Forest Code as a Harmful Subsidy: encouraging waste, punishing efficiency*. WWF UK, 2013; Brazilian Agriculture: The miracle of the cerrado." *The Economist*. 2010. Available at: <http://www.economist.com/node/16886442>.

⁵⁰ GTPS. *White Paper: Mechanisms for control and mitigation of deforestation in the Brazilian Amazon Biome*. Global Roundtable on Sustainable Livestock, 2013.



Area embargos	A list of area embargos published and updated daily by IBAMA, the Federal Environmental Protection Agency, and an Environmental Clearance Certification
Territorial Intelligence Center	The Center (NIT) launched by the Secretariat of Strategic Affairs (SAE/PR) and the MAPA to evaluate agribusiness policies, in connection with the Agriculture Observation and Monitoring System (SomaBrasil), developed by EMBRAPA.
Green Municipalities Program	The Program (PMV) supports greening of municipalities in the State of Pará.
Legal Land Program	A program for the legalization of land.
Forest Investment Program	A targeted program under the Strategic Climate Fund, which includes a component to assist farmers in adopting low carbon agriculture practices.
Beef production registry program (SISBOV)	A registry program by MAPA to certify the beef value chain.

D. Voluntary initiatives

There are also a number of voluntary private and public-private initiatives for sustainable intensification of agriculture, especially beef production, with a focus on reduced deforestation. An important initiative is the Brazilian Roundtable on Sustainable Livestock (GTPS), a national multi-stakeholder partnership between producer organizations, beef processors, meatpackers, agricultural NGOs, environmental organizations, retailers and restaurant chains. Given the heterogeneity of the sector, consensus building (e.g. on a standard for sustainable beef production) or substantial commitments are limited, but the roundtable provides an important platform for dialogue, awareness building, demonstration projects (e.g. members already initiated several pilots for sustainable beef) and for increased vertical integration of the supply chain. Several other initiatives have been launched by NGOs or jointly by NGOs and private sector (e.g. major processing companies), such as Wal-Mart's Livestock Pact to limit illegal activities in the value chain, Carrefour's sustainability standards, *Institute Centro de Vida*'s Low Carbon Ranching Program, *Instituto de Pesquisa Ambiental da Amazônia*'s research program.

Various other policies are not specifically focused on agricultural emissions but on the reduction and regularization of deforestation, such as moratoria on beef and soy production that involves deforestation. E.g. soy and cattle moratoria of 2006 and 2009 have achieved considerable success in reducing deforestation in the Amazon. Under the soy moratorium, which began with a Greenpeace campaign connecting deforestation with demand for soya in Europe, the Brazilian Vegetable Oil Industry Association - whose members included the majority of Brazilian soy traders – agreed not to purchase soy from newly deforested areas of the Brazilian Amazon. Similarly, the cattle moratorium was an agreement by four meatpacking giants: JBS, Bertín, Marfrig and Minerva - following another Greenpeace report about the impacts of cattle ranching on the amazon - to only buy beef from ranches that can demonstrate zero deforestation after October 5, 2009. Rabobank for example has adopted a comprehensive social and environmental policy based on excluding and qualifying criteria for new investments.⁵¹

⁵¹ Rabobank Brazil. *Rabobank Brazil – CSR Policy*. Rabobank Brazil, 2012.



E. Actors

Actor	
Government	Ministries of Agriculture, Livestock and Supply, Agrarian Development, Environment, etc. Federal Environmental Protection Agency State and Municipal Governments
Research & technical assistance service providers	EMBRAPA and other institutions in the National Agricultural Research System
Associations	Brazilian Association for Technical and Rural Assistance Local farmers associations Brazilian Association of Zebu Cattle Breeders (ABCZ) National Confederation of Agriculture and Pasture Association of Supermarkets National Agriculture and Livestock Confederation
Agribusiness	Beef: JBS, Marfrig, Brasil Foods, ABIEC, CICB, Gelita, Minerva Retailers: Carrefour, MacDonald's, Wal-Mart
Financial institutions	Bank of Brazil Brazilian Development Bank Rabobank Brasil International Finance Cooperation Santander Other banks relevant for ABC or rural credit programs
NGOs and Think Tanks	Aliança da Terra, Amigos da Terra, Associação dos Profissionais de Pecuária Sustentável, Conservation International, Greenpeace Brazil, Imaflora, Imazon, Instituto de Pesquisa Ambiental da Amazônia, Instituto Internacional para a Sustentabilidade (IIS), National Wildlife Foundation, Solidaridad, Rainforest Alliance, The Nature Conservancy, WWF-Brazil, Universidade Federal do Mato Grosso do Sul (UFMS), Universidade Federal do Rio Grande do Sul (UFRGS), Universidade Federal de Viçosa/Projeto SALSA
Cooperatives	Coopavel, COAMA, Cocamar