The Nature Conservancy

Sustainable Agriculture

Efficient and Responsible Use of Natural Resources

nature.org/brazil
The global demand for responsible agricultural production is one of the greatest opportunities for environmental conservation today. But there are many challenges ahead. One of this century’s biggest agricultural challenges is meeting the growing global demand for food and ensuring that we achieve increased food production more efficiently and grounded in sustainable action. Brazil is playing a key role and has the necessary conditions to make this change. This document describes the contributions and strategies of The Nature Conservancy and its partners in their endeavors to assist Brazil’s transition to a more sustainable agriculture.
Global Context

Growing Demand for Food and Water

The agricultural production of food and biofuels needs to grow 70% to meet the global demand of a population that is expected to reach 9.1 billion by 2050, according to the FAO.¹ In order for this to occur, there has to be a significant increase in the energy and water supply – agriculture is the biggest water user among the economic sectors.

The availability of these resources depends on the constant provision of ecosystem services, such as a stable climate and healthy hydrological cycles. However, scientists have seen that as much as 60% of the world’s ecosystems have been degraded or are being used unsustainably.² Many ecosystem services have deteriorated as a result of action aimed at providing other services, such as food production. So it is essential that agricultural intensification and expansion take place in a sustainable manner, ensuring the conservation of natural resources.

In an effort to find solutions for the major environmental challenges facing humanity, the Conservancy has established a platform of global priorities that includes support for the development of sustainable agriculture. Our vision is that by 2050 the sustainable intensification of agriculture will meet global demand for food without further loss of natural ecosystems.

¹ UN Food and Agriculture Organization.
² UNEP Millennium Ecosystem Assessment, 2005.
The Nature Conservancy

The Nature Conservancy has helped protect more than 119 million acres of land and thousands of miles of rivers worldwide, as an ongoing commitment to its mission to conserve the lands and waters on which all life depends. The organization has been very active in the protection of nature and preservation of life since 1951 and is one of the world’s leading environmental NGO, with activities in more than 30 countries, including the United States, Kenya, Argentina, Mexico, Peru, China and Mongolia.

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The Nature Conservancy has been in Brazil since 1988 and has a number of projects in the Amazon, Caatinga, Cerrado, Atlantic Forest and Pantanal biomes. Its efforts are based on reconciling the protection of natural ecosystems with economic and social development, while respecting the traditions of local communities, avoiding confrontation and seeking partnerships with the public and private sectors, and civil society. The Conservancy’s work in Brazil focuses on: Sustainable Agriculture, Indigenous Lands, Water, Forests, Climate and Smart Infrastructure.
When one talks about Brazil it tends to be in superlatives. In less than thirty years, the country has transformed itself from food importer into one of the world’s leading breadbaskets. Brazil is the first tropical country to be among the world’s leading food exporters. It is now the leading producer and exporter of sugar, coffee and orange juice, and the second largest for beef, soybeans, tobacco and sugar cane. The country is also notable for its level of productivity and leads the world in soybean yield.3

The cost of this increase in production has been the deforestation of vast areas of high ecological value - Brazil is the most biodiverse country on Earth, and about 12% of the world’s species, as well as the world’s largest river basin, are found there.

Although the deforestation rate has fallen recently, Brazil is still the world’s fourth largest emitter of greenhouse gases, almost all of which is the result of deforestation.\(^4\) Fully 76% of the country’s CO\(_2\) emissions are caused by changes in land and forest use, such as deforestation, with more than half of these occurring in the Amazon region, mainly due to livestock farming.

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Total deforestation rates

88% of the Atlantic Forest

48% of the Cerrado

17% of the Amazon

Sources: SOS Mata Atlântica, Ministry of the Environment and INPE.

The Nature Conservancy’s approach to Sustainable Agriculture in Brazil

The Nature Conservancy has worked in Brazil since 1988 and has played a leading role in creating and implementing a positive agenda to reconcile responsible production with conservation of biodiversity and social development.

With the expansion of farming in Brazil and the consumer market’s demand for responsible production, the agricultural sector has worked to improve its environmental performance and become more competitive in the commodity market. For the Conservancy, success in sustainable agriculture means changing from the historical model of geographically extensive production to more efficient intensive production, in accordance with the prevailing environmental legislation and without further loss of natural ecosystems. In this respect, we believe that the sustainable intensification of agriculture can increase productivity and the income on farms, while simultaneously reducing environmental impact and ensuring the health of supporting ecosystems.

In addition to the efficiency gains of improving practices in a given location, there is also the decision of where to work in the first place. The channeling of production efforts into underutilized areas that have already been deforested and offer high or medium agricultural potential can add value to the entire production cycle, especially if logistics and existing and planned infrastructure are taken into account. This reasoning has led the Conservancy to develop the following strategies for strengthening sustainable agriculture: Sustainable Production Chains, Environmental Governance, Management and Planning Tools and Economic Incentives.

With the expansion of farming in Brazil and the consumer market’s demand for responsible production, the agricultural sector has worked to improve its environmental performance.
A company cannot be considered socially and environmentally responsible if any of the links in its production chain – related producers, suppliers, distributors or retailers – does not meet the standards of good practice. On the other hand, healthy links make a strong supply chain, offering better performance and competitive advantages. Consequently, determining and monitoring standards for good social and environmental practice of agricultural commodities, from source to final destination, will give them legitimacy as responsible products in the eyes of consumers, who are increasingly demanding sustainable products. The following are the Conservancy’s main activities regarding this topic.

**Stimulating Good Agricultural Practices**

Good agricultural practices are a set of principles, standards and technical recommendations applicable to the production chain and focused on the preservation of human health, environmental protection and improving the conditions of workers and their families. Good practices refine the traditional and current techniques for farmers, while introducing sustainability concepts to production. In terms of the market, good practices reassure consumers that commodities conform to the best industry standards.

The Conservancy is helping disseminate good practices within the agricultural sector through workshops, institutional outreach partnerships and training for farmers, labor union officials and municipal government employees. We are also piloting solutions in the field, applying agricultural management techniques that reduce carbon emissions and tools that measure the efficiency of the use of land and natural resource. Our work is based on programs to mitigate environmental impacts and improve agricultural performance, such as the Field Print Calculator.6

**Socio-Environmental Certification**

The tendency is for future agricultural commodity production to follow economic, social and environmental standards, governed by responsible agricultural practices. For several years, the agricultural sector has been developing specific standards for socio-environmental certification based on sustainability principles and in response to the market, particularly the international one, and the possibility of adding value to its products. In Brazil, the Conservancy actively participates in discussions on the adoption of best practices taking place in the Sustainable Livestock Farming Working Group (GTPS) and the Brazilian Forest Dialogue. The organization also supports the implementation of the 4F initiative (Food, Fuel, Fiber and Forests) and the certification criteria of the FSC Brazil Board, and of the Round Table on Responsible Soy (RTRS).

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6 Available at: http://www.fieldtomarket.org/fieldprint-calculator
Assessing the Water Footprint of Companies

Companies are increasingly concerned about measuring not only their direct use of fresh water in the development of a product or service, but also the indirect use along the production chain. The Water Footprint concept was developed as a multi-dimensional indicator showing the volume of water consumption according to source and pollution level according to the type of effluent. It provides a broad view of the relationship between a specific consumer or product and the use of water resources. Once the footprint has been calculated and its sustainability has been assessed, the company can establish a corporate policy for water use in order to avoid, reduce and eventually offset its water footprint and achieve water neutral status. The Conservancy has been developing projects for the assessment of water footprint in Brazil and proposing conservation measures and forest restoration actions as a way to offset the footprint.

The Water Footprint concept provides a broad view of the relationship between a specific consumer or product and the use of water resources.
More Sustainable Livestock Farming

The municipality of São Félix do Xingu (Pará state) has the largest cattle herd in Brazil, at approximately two million head, and also has one of the highest historical rates of deforestation in the Amazon region.\(^7\) The ranching productivity in this region is low, with 80% of the area of pastureland underutilized, even though the agronomic potential ranges from good to average. In order to change the situation regarding deforestation, restore degraded areas and establish a responsible integrated supply chain for beef, the Conservancy began working in the region in partnership with farming unions and companies in the livestock sector, such as Marfrig, and retailers like Walmart. A total of 20 pilot projects are being implemented, focused on improving production techniques and productivity that lead to a more sustainable intensification of livestock farming involving around 100,000 acres, and improving access to technological tools and rural credit. Moreover, there is monitoring of the forest cover of 900 farms, which together represent an area of approximately 6.7 million acres. The goal is to replicate the project in another 150 farms within two years, and disseminate the experience through round tables, such as the Brazilian Roundtable on Sustainable Livestock and the Green Municipalities Program (PMV), an initiative of the state of Pará.

The purpose of tracking along the supply chain is not to punish producers, but to more closely monitor the environmental status of the farms.
Just as the private sector has its socio-environmental responsibility to live up to, so the public sector has a role to play in implementing policies and establishing legal frameworks that ensure adequate environmental management and integrity throughout their territory. This is known as environmental governance, which is viewed as inter-sectorial and multi-disciplinary, and is organized on a territorial basis to promote cooperation between the government, the production sector, social organizations and local society.

A sound and participatory government structure is required to ensure the environmental management of the area and guarantee that all legal aspects of the Brazilian Forest Code and other environmental legislation are met. Technology development, the increased capacity of public agencies and effective participation of civil society and the private sector ensure that the actions taken actually reduce deforestation and promote the rational use of natural resources.

The Conservancy has helped fine-tune the environmental management, compliance, control and monitoring models that are used by the state and municipal governments. Our goal is to help bring rural properties into compliance with environmental legislation in order to influence and extend large-scale conservation, and contribute to effective zoning.
Our actions to strengthen environmental governance are:

- Helping define clear, publicly-accessible environmental licensing rules and procedures with state governments (in systems known as SIMLAM).

- Establishing geographical information systems that use cartographic data of rural properties to facilitate the monitoring and control of deforestation, degradation and forest restoration.

- Training and reinforcing the efforts of public agencies responsible for environmental management and land titling, so that there is greater interest in implementing sustainable practices on rural properties.

- Establishing agreements and local arrangements that outline specific responsibilities for each sector to bring properties into compliance with environmental legislation, working at the municipal level, with state and federal participation.

**The Green Municipalities Program (PMV)**

The removal of Paragominas’ name from the Ministry of the Environment’s list of municipalities with the highest rates of deforestation in the Amazon region inspired the Pará state government to set up the Green Municipalities Program (PMV). The aim of the program is to reduce deforestation and encourage a low carbon rural economy with enhanced added value. In 2012, INPE (National Institute for Space Research) registered the lowest rate of deforestation in the Amazon since 1988 and the state of Pará accounted for 75% of this reduction, due to the success of the PMV. In addition to coordinating the efforts of mapping and integrating rural properties in Paragominas into the state Rural Environmental Registry (CAR), the Conservancy participated in the preparation of the legislation introducing the CAR in the state. The organization joined the PMV Steering Committee and has been a partner of the state in the efforts to remove other municipalities from the list. Of the 144 municipalities in Pará, 89 have joined the PMV, which has a goal of having all of the state’s municipalities removed from the list by 2015.
The development of tools for mapping, registering and monitoring the environmental assets and liabilities of rural properties is an important step in creating sustainable productive landscapes that are efficient in their production process and use of natural resources. The Conservancy has played a key role in the development of technical and scientific tools aimed at providing governments, farmers, investors and the private sector with reliable information on which to base their decision making. Many of these tools help farmers and government agencies follow the requirements of the Forest Code, which demands that a certain percentage of rural properties (the “legal reserve”), as well as certain vulnerable areas like steep slopes and riverbanks (“permanent preservation areas”), be conserved as native vegetation. The following are the main tools we use – they can be applied to rural properties in the country’s municipalities or to entire river basins, depending on the need.

Rural Environmental Registry (CAR)

In 2005, the Conservancy developed and implemented pioneering initiatives with key partners in the states of Mato Grosso and Pará in order to maximize the conservation of natural ecosystems and the process of adapting rural properties to the environmental legislation. This paved the way for the introduction of the Brazilian Rural Environmental Registry (CAR), which became federal law in 2009 and was incorporated into the new Brazilian Forest Code in 2012. As part of this process, and with a view to facilitating the implementation of the CAR, the Conservancy developed the following tools:

**CARGEO** is a tool that enables the structuring of databases containing the geographically-plotted information of rural properties obtained in the field or from satellite images. The tool shows the vegetation cover and defines the true situation of the property, taking into consideration the environmental legislation criteria for Legal Reserves and Permanent Preservation Areas (APPs). Maps and reports can thus be generated to provide environmental analysis of the property.
**LEGALGEO** is a tool aimed at creating scenarios and considering the allocation of important areas for conservation. Following mapping of the Legal Reserve deficit or surplus, priority areas are identified for allocation, compensation or restoration, based on analysis of the landscape. For the allocation of Legal Reserves, for example, one can identify the large vegetation blocks that are important for conservation. When restoration of Legal Reserves is required, areas near or adjacent to sizeable native vegetation remnants are considered, as well as those that can be interconnected to create ecological corridors or conservation areas.

**Greener Soybean Production**

The Nature Conservancy began its rural environmental compliance efforts in Mato Grosso with the project Lucas do Rio Verde Legal, under which 100% of the rural properties in the municipality were mapped. This project led to the Greener Soybean initiative, which aims to ensure the sustainable production of soybeans in the state through the mapping and environmental compliance of rural properties. Implementation of the initiative was undertaken by Aprosoja (State Soybean and Corn Producers Association), with support from Syngenta, Amaggi, Fiagril and other entities. The Greener Soybean initiative was started in Sorriso and quickly expanded to nine other municipalities in the major Brazilian soybean producing regions of the Upper Teles Pires and western Mato Grosso. The Conservancy coordinated the project with the support of the Ministry of the Environment project and the BNDES (Brazilian Development Bank) Amazon Fund.
**Go Zones & No-Go Zones** – The Conservancy has been working in partnership with University of São Paulo - Esalq on this innovative spatial analysis tool that shows the most promising areas for tree plantations and crops, and for pastures, taking into consideration the areas that are to be set aside for conservation. These analyses identify areas of pasturage with high and medium potential for increasing agricultural production and productivity, as well as protected natural ecosystems and areas of significance for biodiversity conservation and provision of environmental services. The Conservancy is a pioneer in the implementing of Go Zones & No-Go Zones in the states of Mato Grosso, Goiás, Mato Grosso do Sul, Maranhão and Tocantins.

**Plans for Biodiversity Conservation** – With the aim of reconciling conservation and sustainable production, the Conservancy and its partners have drawn up plans for biodiversity conservation in areas used for farming and forestry. The main objective is to ensure that the remaining natural ecosystems located within productive landscapes are identified; that their importance is recognized; that they are suitably managed, and that there is a plan for monitoring the biodiversity and the main threats to their well-being.

**Identifying High Conservation Value Areas (HCVA)** – This strategy gives special attention to the identification of areas of great importance for biodiversity conservation. These analyses use the Conservancy-developed methodology known as Conservation Area Plan. This approach takes an ecological inventory of the study area, and develops a landscape plan based on results; the plan includes restoration, environmental conservation, and environmental service maintenance activities, all aimed at creating ecological corridors and sustaining the biodiversity identified.

**Municipal Micro-zoning** – The Conservancy has worked with local governments to carry out micro-zoning aimed at sustainable land use within the municipalities. To this end, the Conservancy has joined the Sustainable Amazon Network (RAS), comprised of more than thirty Brazilian and foreign research institutes, NGOs and universities. Focusing on both terrestrial and aquatic environments, the RAS has been carrying out a detailed mapping of fauna and flora biodiversity, ecological services, land use, vegetation cover and environmental threats at watersheds. The network has also gathered socio-economic information about the municipalities of Paragominas and Santarém, in Pará state. The goal is to develop a replicable management model that balances socio-economic gains with environmental conservation activities as part of the participatory process of discussing municipal zoning.
Field to Market – The Conservancy is a member of this alliance of farmers, agribusiness, food and retail companies, and environmental NGOs that are working collaboratively to develop a sustainable production chain for agriculture. One of the principal goals of this alliance is to determine indicators that measure agriculture’s socio-economic, environmental and health impacts and thereby create a sustainability index that facilitates the measuring and continued improvement of the activities over the years. The Conservancy has initiated discussions in Brazil regarding the first pilot project, which may be located in the Tapajós river basin, in the state of Pará.

Cargill Project

The Conservancy has been working with Cargill Agrícola S.A. in Brazil since 2004 to reduce deforestation in areas of soybean expansion, and promote responsible management among its suppliers in western Pará and, more recently, in northern Mato Grosso. The Rural Environmental Registry (CAR) and monitoring activities allow the company and farmers to obtain information about the environmental status of their properties, and then take the necessary management steps. As of 2012, significant results had been obtained on 466 monitored farms in the region of Santarém (Pará state). In 2004, the deforestation rate in the municipality was 4.3%, and in 2012 it had fallen to 0.1% (see chart). This is in contrast to other production centers in the state, which have seen an increase in their deforestation rates associated with grain production. The total area covered by the project is 324,000 acres of which 141,000 acres are native forests. The project also seeks to reduce the impact of agriculture on water resources, and a map showing the risk of erosion associated with the possible expansion of grain cultivation in the Curua-Una river basin is being developed. The 19,000 mi² area is located not far from the port of Santarém.
One of the controversial aspects in achieving sustainable production chains is the financial capacity of the rural landowners and agribusinesses to comply with legal requirements and introduce better agricultural practices. Both the restoration of degraded areas and the purchasing of natural ecosystems for environmental compensation are complex activities involving significant financial investment. In the case of properties with environmental assets, there are expenses for the maintenance and protection of these areas, in addition to the loss of income for lack of production activities, which the owner often considers as a loss.

Once it has been understood that these natural ecosystems have economic value and provide ecological services for agricultural production and for society as a whole, it is of paramount importance to identify economic mechanisms that encourage farmers to protect their natural ecosystems. In this context, the Conservancy is facilitating the development of economic alternatives that promote compliance with environmental legislation and enhance the value of the natural assets that are being preserved, including:

**Payment for Environmental Services (PES)**

### PES to Protect Water Resources

One of the ways the Conservancy and its partners generate economic incentives is by developing Payment for Environmental Services (PES) projects that allow rural landowners to carry out conservation and forest restoration activities to protect water resources in key areas – along rivers, around springs and on hilltops – in the country’s priority regions. Developed in partnership with ANÁ, these “Water Producer” projects recognize that the natural ecosystems on these properties provide environmental services for society, such as the absorption of rainwater and the filtering of sediment, and their protection deserves to be compensated. Funding for compensating producers that allow

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8 The Conservancy has developed PES projects in the municipalities of Extrema (Minas Gerais state), Joanópolis and Nazaré Paulista (São Paulo), Rio Claro (Rio de Janeiro), Balneário Camboriú (Santa Catarina), Ribeirão do Pipoí (DF/Goias) and Palmas (Tocantins).

9 Brazilian National Water Agency.
nature to provide environmental services comes from a variety of sources, such as Watershed Committees that collect a fee from major water users, municipal and state funds, water regulatory agencies and others. The Nature Conservancy is currently helping implement seven PES-Water initiatives in Brazil, all of them close to major urban centers with high demand for water, such as São Paulo and Rio de Janeiro, as well as six state programs. In addition, the organization has influenced public policies that address the issue in the municipal, state and federal spheres.

**PES to encourage Carbon Sequestration projects**

Forests not only provide for the protection and maintenance of water resources, but also for climate stabilization. Forests extract CO$_2$ from the atmosphere, absorb the carbon in their biomass and release the oxygen back into the atmosphere. In CO$_2$ sequestration projects implemented by means of forest restoration, it is possible to measure how much carbon an area of forest stores over the course of its development, and this generates carbon credits that can be placed on the market for the purpose of offsetting greenhouse gas emissions. The Conservancy has developed projects of this kind and used the funds generated to co-finance forest restoration activities, thereby generating payments for the environmental services provided. This economic incentive has contributed to the process of bringing rural properties into compliance with the Brazilian Environmental legislation.

**Forests extract CO$_2$ from the atmosphere, absorb the carbon in their biomass and release the oxygen back into the atmosphere.**
Reducing Emissions from Deforestation and Forest Degradation (REDD+)

Recognizing the powerful impact that the destruction of tropical forests has on greenhouse gas emissions, the countries that signed the UN Framework Convention on Climate Change (UNFCCC) created an international mechanism for Reducing Emissions from Deforestation and Forest Degradation and maintaining and augmenting the carbon stocks in the world’s forests (REDD+). The mechanism is scheduled for adoption in 2020 and Brazil is playing a vital role in the discussions since it has the largest remaining area of tropical forest and is the fourth largest emitter of greenhouse gases, mostly as a result of deforestation.

The Conservancy and the municipal government of São Félix do Xingu (Pará state), in partnership with local entities, are designing a large scale pilot program to demonstrate the REDD+ concept and provide a practical example. This project seeks to create economic value for forest conservation and to generate significant income in order to transform the economy into a sustainable, low-carbon system that can sustain local people, including Indigenous communities, while also protecting the biodiversity and the environmental services that are generated. One of the strategies for implementing the pilot program is to set up the São Félix do Xingu Fund with the participation of diverse stakeholders. The goal of the Fund is to finance projects that promote greater efficiency in agricultural production and agroforestry systems, facilitate access to lines of credit, and implement forest restoration and conservation activities, thereby helping to reduce deforestation and forest degradation.
Outcomes for companies, associations and farmers

The adoption of good socio-environmental practices is a growing trend among farmers, associations and companies that want to add value to their business and throughout the entire production chain. The following are some of the direct benefits to be derived:

- Access to mechanisms that enable compliance with the environmental legislation and the standards of certification agencies, thus reducing the outside pressure for responsible production, and improving access to lines of credit.

- Information about the environmental status of the property or company and its supply chain to help guide decision making.

- Access to innovative monitoring/tracking tools for rural properties that confirm their compliance status and absence of illegal deforestation.

- Access to models and tools that make it possible to identify the best areas for the expansion of agricultural production and environmental conservation.

- Access to technical information about restoration, environmental conservation, climate change mitigation and good agricultural practices that can be used to communicate actions and sustainability reports to a variety of audiences.

- Strengthening of one’s reputation amongst stakeholders and other audiences as a responsible company that is concerned about its socio-environmental impact.
The global demand for responsible agricultural production is one of the greatest opportunities for environmental conservation today. But there are many challenges ahead. One of this century’s biggest agricultural challenges is meeting the growing global demand for food and ensuring that we achieve increased food production more efficiently and grounded in sustainable action. Brazil is playing a key role and has the necessary conditions to make this change. This document describes the contributions and strategies of The Nature Conservancy and its partners in their endeavors to assist Brazil’s transition to a more sustainable agriculture.
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