CERRADO ALIVE

INICIATIVES AND SUSTAINABLE SOLUTIONS TO KEEP THE MOST **BIODIVERSE SAVANNAH IN THE WORLD STANDING**

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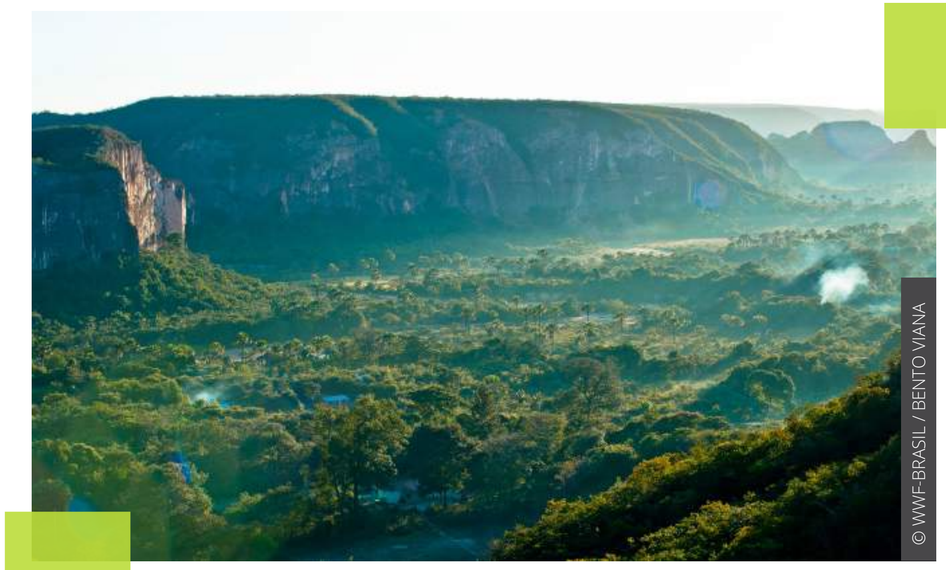
SUMMARY



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INTRODUCTION

The knowledge constructed for decades of studies and field experience on the Brazilian Cerrado is enough to affirm that is possible to conserve the Cerrado's biodiversity and waters, to produce without converting new areas, and to support the lifestyle of communities, which makes sustainable use of its resources.

WWF-Brazil has a long performance record on the Cerrado biome. This work started on the 90' decade in the Chapada dos Veadeiros National Park. Since 2010 the organization also performs on the areas covered by the **Sertão Veredas Peruaçu Mosaic**, and, currently, it achieves others Cerrado's regions.

The organization along with other partners is part of the Cerrado Initiative, an extensive program of conjoint actions to combine conservation, business and social development to consolidate a positive and sustainable future for the biome. In this material are presented the challenges, opportunities and solutions to make real the future vision of a more resilient, productive, inclusive and sustainable Cerrado until 2030.

THE BRAZILIAN CERRADO

THE OLDEST AND MOST BIODIVERSE SAVANNAH IN THE WORLD

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OVER 12000
species of plants

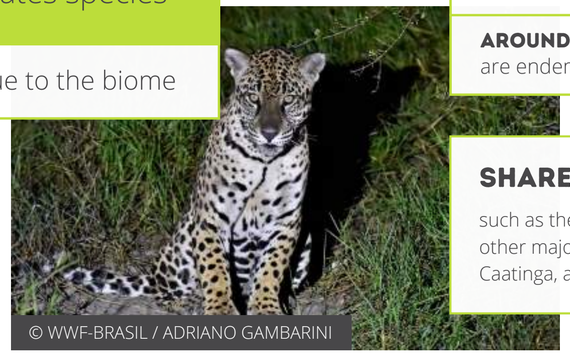
OVER ONE THIRD are exclusive from the Cerrado

5% of the world's plants and vertebrates species

32% are unique to the biome

AT LEAST 2373
vertebrate species

AROUND ONE FIFTH
are endemic



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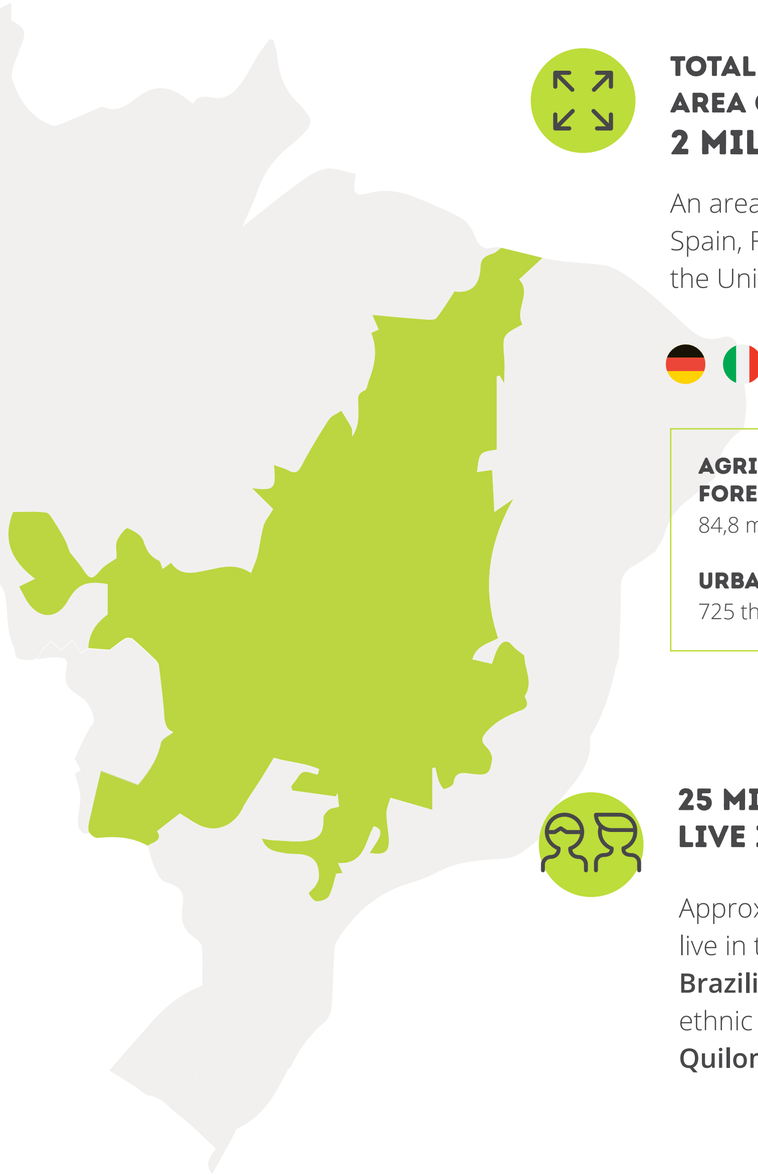
SHARES SPECIES

such as the jaguar with Brazil's other major biomes (the Amazon, Caatinga, and Atlantic Forest).



TOTAL ORIGINAL AREA OVER 2 MILLION KM²

An area equivalent to the size of Spain, France, Germany, Italy, and the United Kingdom put together.

AGRICULTURE AND FORESTRY AREA
84,8 million hectares

URBAN AREA
725 thousand hectares

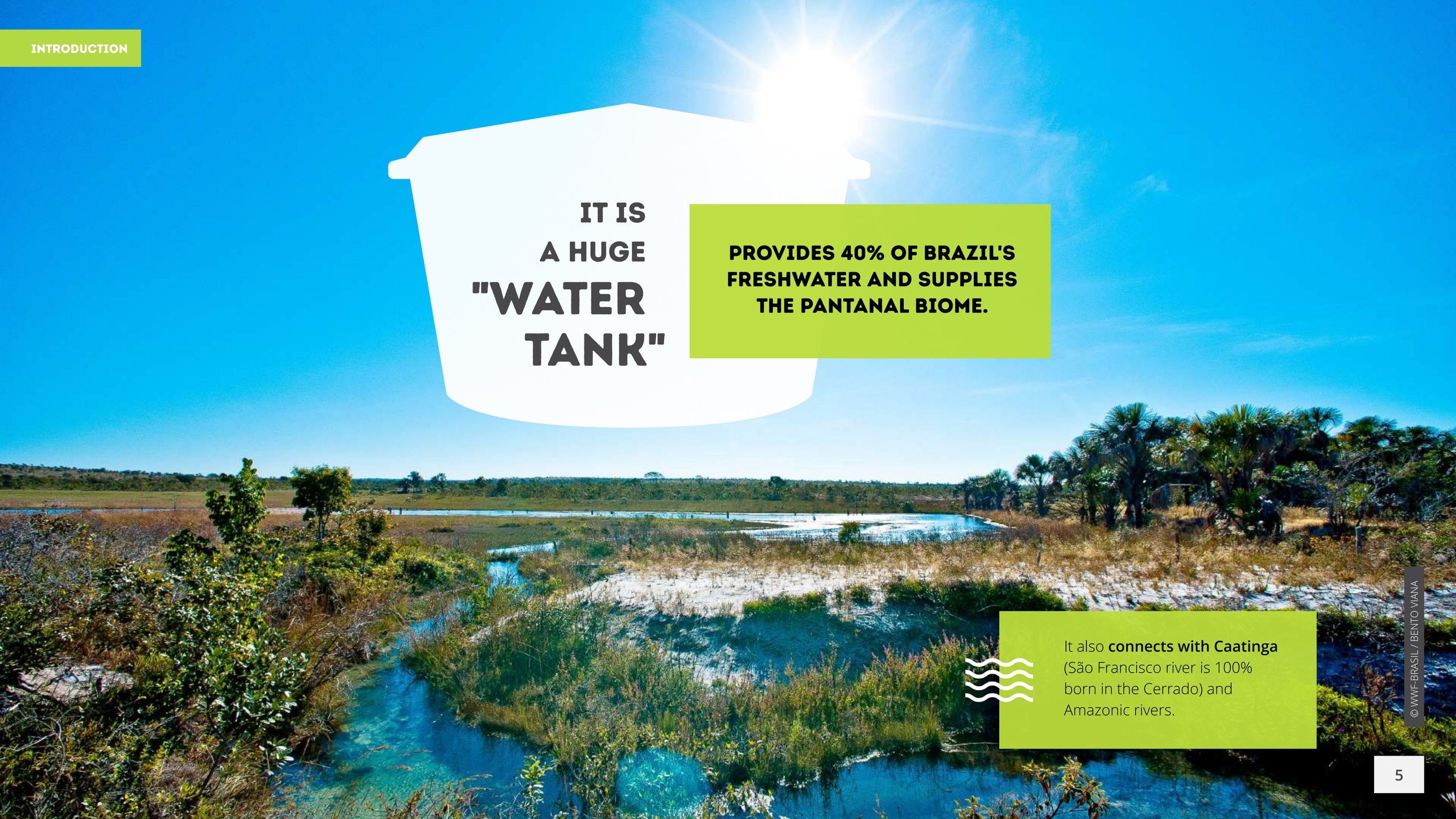
25 MILLION PEOPLE LIVE IN THE CERRADO

Approximately 25 million people live in the Cerrado – **12% of the Brazilian population** –including 80 ethnic groups and **around 1,700 Quilombola communities**[1].

1 The Society, Population and Nature Institute (ISPN).

IT IS A HUGE "WATER TANK"

PROVIDES 40% OF BRAZIL'S FRESHWATER AND SUPPLIES THE PANTANAL BIOME.



It also **connects with Caatinga** (São Francisco river is 100% born in the Cerrado) and Amazonic rivers.

CONVERTED AREAS

NIn the past, the Cerrado occupation process did not consider the impact over the ecosystem services. Thereby, numerous areas that are **key to maintaining habitat connectivity and protecting rivers** have been converted. The permanent protected areas liabilities in the Cerrado are estimated to be around 2 million hectares, according to the Forest Code.

LACK OF LEGAL PROTECTION

8%
of the Cerrado is officially protected

3%
of the Cerrado is covered by strictly protected areas

20% TO 35%
of private land have to be conserved

CARBON STOCK

The Cerrado is also a **vitally important** carbon stock, storing around 13.7 billion tons of carbon, two-thirds of which underground.

AGRICULTURE

Is one of the biggest and more active agricultural poles of the world.

MAIN PRODUCTS

- Soybean
- Beef
- Cotton
- Sugarcane
- Eucalyptos production
- Corn

DEFORESTATION AND LAND CONVERSION

Half of the Cerrado has already been decimated to make way for agriculture and the rest is under immediate threat.

TRADITIONAL AND INDIGENOUS PEOPLES

The Cerrado is home for hundreds of traditional and indigenous peoples. People which their livelihoods are extremely related with the biodiversity and use of the biome resources.

IRREPLACEABLE WEALTH

In the heart of Brazil, a range of savannah, forest and grassland habitats make up the Cerrado, one of the world's richest and most endangered areas of biodiversity. This biodiversity hotspot is home to 5% of all the species on the planet and 30% of those found in Brazil, with over 32% of these being endemic. However, the Cerrado is rapidly disappearing and only limited areas of this natural heritage are under protection. In recent decades, **50% of its vegetation has been converted** into pastureland and agricultural activities – particularly soy.

The Cerrado spans one of the oldest regions of Brazil, which is around 40 million years old. Its central location surrounded by four other biomes **– the Amazon, the Pantanal, the Caatinga and the Atlantic Rainforest**, has led to its wide variety of diverse habitats and high levels of endemism. The Cerrado is home to a wide variety of species, including 837 birds, 120 reptiles, 210 amphibians, 1,200 fish and 199 mammals. The biome contains 14,000 plant species, and many of these have a high commercial value and are used sustainably by the region's traditional communities.

Across its expanse of 200 million hectares (half that of the Amazon) spread over 11 states and the Federal District, the Cerrado provides at least two fundamental ecosystemic services to Brazil and the rest of the planet: water and climate regulation. The Cerrado provides almost half of Brazil's fresh water and stores approximately 13.7 billion tons of carbon dioxide (CO_2), which is equivalent to Brazil's total emissions over nine years.

The protected areas of the Cerrado **guard these services to humanity**, mitigating the regional climate change that is caused by changes in land use and maintaining important areas that supply three aquifers and eight of the country's water basins.

LACK OF PROTECTION

Just 8.3% of the Cerrado is covered by protected areas, and only 3% of these are fully protected, including parks and reserves. In addition, the biome is not afforded much protection on private property. Brazil's Forest Code requires that 20% to 35% of areas of Cerrado on private land must be kept in legal reserves, which is much lower than the 80% stipulated for the Amazon. This lack of protection is a serious problem as the protected areas that exist are poorly distributed and are concentrated in the northern part of the biome, leaving 62% of the region's plant and animal species and the threatened ecosystems of the Cerrado completely unprotected[2].

2 Priority Areas for the Conservation of Biodiversity in the Cerrado and the Pantanal. Brasília - DF, 2015: WWF-Brazil.

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Expanding the current network of existing protected areas to 17% of the Cerrado by 2030 will be essential in increasing the level of protection of priority areas, which will prevent the extinction of species, and maintaining the ecosystemic services of climatic and water regulation, amongst others.

In 2010, during its 10th edition held in Nagoya in the province of Aichi, the Convention on Biological Diversity established 20 goals to detain the loss of the planets biodiversity, one of which being for countries to ensure that 17% of their land and continental aquatic areas must be conserved through systems of protected areas.

In order to achieve this goal, Brazil would have to create today over than 260 thousand km² of Protected Areas.

An alternative approach would still be the incentive to creation of municipal protected areas, with direct benefits to the municipal administrations involved [transfer of ICMS (Tax on Circulation of Goods and Services in Portuguese) Ecological, for example].

As well as creating new parks and reserves, one emergency measure is to prevent losses in existing protected areas through Protected Area Downgrading, Downsizing and Degazettement (PADDD). By 2008, 26 PADDD events had managed to reduce the protected areas in the Cerrado by 13%. Other actions are still underway and are threatening 13 important protected areas.

It is recognised that alterations to protected areas' boundaries and even categories may have beneficial effects on the national system of protected areas, but just if these changes are transparent, involve advantages for the conservation and sustainable use of biodiversity, contribute to the well-being of the populations they impact and follow legal and pre-defined procedures. However, what has happened in some states in Brazil is that proposals lack technical and scientific arguments, and are even clearly unconstitutional.

Moreover, many of the proposals presented by the legislative and executive powers at the three levels of government clearly demonstrate the prioritisation of individual or sectoral interests over those of wider society.

In order to fight back against this attack to weaken the national system of protected areas, it is important to understand the apparent and hidden motives behind PADDD proposals, map trends in changes in the use of land caused by public policy, or a lack thereof, and maintain joint monitoring and advocacy actions at the three legislative levels.

OVER 2 MILLION HECTARES
OF PROTECTED AREAS HAVE BEEN LOST IN THE CERRADO

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Protected Area	17	8.33%
Fully Protected	6	2.96%
Sustainable Use	11	5.37%
EPA	10.6	5.19%
Other	0.36	0.18%
Indigenous Land (IL)	**9.8**	**5.78%**
Quilombola Land (QL)	**0.6**	**0.28%**
Total (PA+IL+QL)	27.4	13.39%
Total (PA-EPA+IL+QL)	16.7	8.20%

Source: SNUC, LAPIG.

Protected Areas are part of Brazil's **priceless national heritage**, and have enormous potential to bring about significant improvements in human well-being and the development of the country. These areas focus on maintaining biodiversity, protecting endangered species and promoting sustainable development, as well as providing the means and incentives required to develop research, environmental education and public use.

3 The Red Book of Brazilian Flora – Rare Plants of the Cerrado. Rio de Janeiro Botanical Gardens Research Institute: CNCFlora, 2014. 320 p.

WE KNOW WHERE TO PROTECT THE CERRADO

The grasslands and veredas, or swampy plains, of the Emas National Park in the state of Goiás are **one of the last refuges** of the jaguar (Panthera onca). This magnificent creature can weigh up to 130 kilos and measure up to 2.4 m in length when healthy. It is estimated that there are 30 of these animals living inside the park's 132,000 hectares, and that over their lifetimes these animals require an area of around 26,500 hectares. There are less than 250 individuals of this species within the entire Cerrado, and this population is currently in decline and officially considered to be endangered (EN)[4], mainly due to the fragmentation and loss of its habit. This is what is happening to the park's jaguars, which are under threat as a result of population and genetic isolation. The park looks like an island surrounded by vast soybean, maize, cotton and sugarcane plantations.

4 ICMBio. Avaliação do risco de extinção da Onça-pintada Panthera onca (Linnaeus, 1758) no Brasil. Disponível em:http://www.icmbio.gov.br/portal/images/stories/biodiversidade/fauna-brasileira/avaliacao-do-risco/carnivoros/on%C3%A7a-pintada_Panthera_onca.pdf

This case of the jaguar exemplifies the loss of habitat and fragmentation of the biome in general, as well as the urgent need to expand the current network of protected areas. In order to identify the most important regions of the ecosystem to ensure the survival of 2,074 endangered endemic animal and plant species, the Ministry of the Environment, with the support of WWF-Brazil, conducted research into priority areas for the conservation of the Cerrado's biodiversity.

The study revealed 337 areas that are essential in preventing the extinction of flora and fauna covering a total area of 66 million hectares, representing 33% of the Cerrado.

These priority areas were selected from those with the highest chance of preserving a region representative of the biodiversity of the Cerrado, therefore guaranteeing its connectivity, the maintenance of ecosystemic services, such as the provision of water supplies for aquifers, and important areas for traditional communities.

Actions working with conservation, recuperation and sustainable use are urgently needed in these remaining fragments of natural vegetation, especially considering that almost 40% of priority areas in the Cerrado have already been converted. "Priority areas must be viewed as a strategic element in the implementation of public policy and for the territorial planning of a range of sectors, guaranteeing an integrated vision of the social, economic and environmental aspects that should be considered for the sustainable growth of the country," states leader of WWF-Brazil's Science Program, Mariana Napolitano, responsible for the study.

THE EXTENT OF THE CONVERSION OF NATIVE VEGETATION IN PRIORITY AREAS OF THE CERRADO

Priority	Total Area (million ha)	Conversion (million ha)
Extremely high	20,611	7,152 (38%)
Very high	39,739	14,552 (37%)
High	16,007	5,609 (35%)

UNPROTECTED

62% of animal and plant species and priority ecosystems for conservation of the Cerrado are not protected by parks and nature reserves.

PROTECTED AREAS AND WATER

Protected areas in the Cerrado conserve 19.6 million hectares of native vegetation remnants that have an important role in the supply of water. It is estimated that the protected areas in this biome alone supply 1.9 million cubic metres of water per year used for human consumption, animal husbandry, irrigation and industrial use, totalling an annual value of R$3.9 million[5].

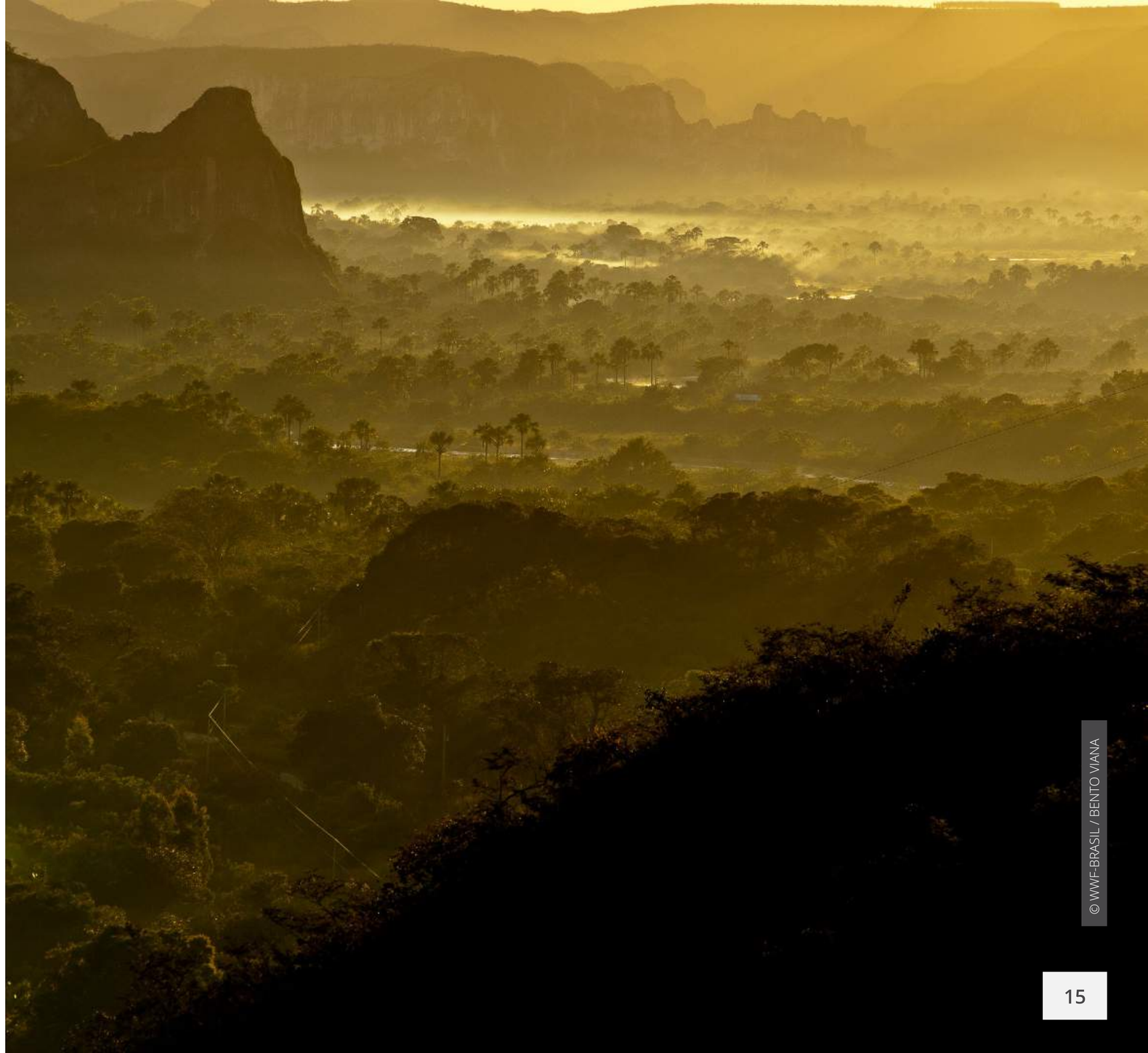
The São Francisco River originates in the Cerrado and **flows 2,830 km** across Brazil, providing a water supply for the populations of five states.

5 The value of being green: the economic Importance of Brazil's protected areas/Carlos Eduardo Frickmann Young & Rodrigo Medeiros (Organisers) – Rio de Janeiro: International Conservation, 2018. 180p. OBS: According to the Ministry of Environment's protected area panel, this figure is lower, at 16.8 million hectares.

THE PRIORITY COMPENSATION SCENARIO

A study conducted by WWF-Brazil and the Department of Environment for the State of Bahia showed that around **40% of the Cerrado in this state is a priority in terms of conservation**. This is enough to ensure the priority compensation of the state's entire legal reserve liability.

Approximately 600,000 hectares of intact Cerrado have been identified that could ensure the representation of this biome's ecosystems in Bahia, protecting endemic and endangered species, maintaining water reservoirs and springs and supplying aquifers. This flat region is the location where the country's expansion of agricultural production is taking place, and as a result has suffered significant irregular conversion of its native vegetation in recent years. It has an estimated environmental liability of 284,000 hectares, and this could be used to protect high value areas outside rural properties.



RARE SPECIES

The friendly **Brazilian merganser** (Mergus octosetaceus) is a rare species, and it is estimated that there are just 250 individuals of this species living in the wild. It is the most endangered bird species in the Americas, and is classified as critically endangered, the highest category on the International Union for the Conservation of Nature and Natural Resources (IUCN) Red List. It can be found in just four locations in the Cerrado, in the states of Minas Gerais, Goiás and Tocantins, in areas that are currently being put under pressure by agriculture and hydroelectric projects.

It requires clean, calm and transparent water to hunt its prey, and for this reason it is extremely sensitive to alterations in water quality. Therefore, the restoration of riparian forest around the water courses of the Cerrado and the creation of protected areas is fundamental in order to prevent the extinction of this species. The largest known populations of the Brazilian merganser are found inside and the areas surrounding six protected areas[6], including the Chapada dos Veadeiros and the Serra da Canastra national parks.

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6 Ministry of Environment. Executive Summary of the national action plan for the conservation of the Brazilian merganser (Mergus octosetaceus), 2014. Available at: http://www.icmbio.gov.br/portal/images/stories/docs-plano-de-acao/pan-pato-mergulhao/1%C2%BA_ciclo/sumario-pato-mergulhao.pdf

ENDEMIC SPECIES

Endemic species are those that **only occur in one region.** Endemism can cover a wide region that spans various countries, or small areas limited to one state or a single river. When species occur in particular very small environments within an ecosystem these are called restricted or locally distributed species, and this makes them even more vulnerable to extinction. The high level of restricted distributed species of fish, reptiles and amphibians in the Cerrado means that many species can become extinct even before they have been discovered.

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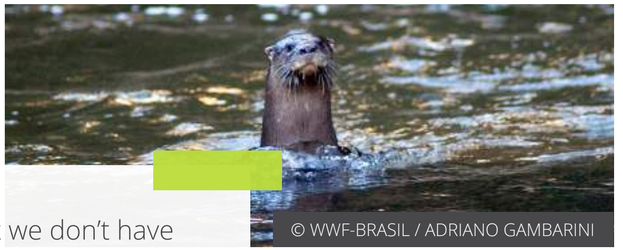
"This means that we don't have the same species in the north and the south regions, and that is why it is so important that a system of protected areas is distributed across the entire biome", explains Ferreira.



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PROTECTING THE CERRADO INSIDE AREAS OF PRODUCTION

With the mapping of priority areas providing a guide for the application of Brazil's Forest Code, the protection of the Cerrado's biodiversity and ecosystemic services can be significantly increased. The Forest Code permits rural properties with less than 20% of standing Cerrado to restore or even buy an equivalent area outside of their boundaries. Across the whole of Brazil, the environmental liability of legal reserves is 16 million hectares[7], with most of this concentrated in the Cerrado and the Amazon. There is the **potential to create a wide network of areas, which will significantly reduce fragmentation, increase connectivity, protect springs and maintain ecosystemic services.**

WWF-Brazil argues that compensating rural producers in the Cerrado should be adopted in priority conservation areas to guarantee greater environmental benefits. This is referred to as priority compensation. Another option is to offer compensation in parts of protected areas associated with land title problems and conflict over land use.

Priority compensation provides a unique opportunity to conserve areas of high socio-environmental value and legalise agricultural and livestock production. In the future, areas purchased by farmers to compensate for their legal reserve could become Private Natural Heritage Reserves (RPPNs), increasing the degree of protection of native vegetation and streams and springs. While legal reserves enable sustainable forest management, RPPNs require full protection and must allow scientific research activities and visits to continue. There are 166 RPPNs in the Cerrado protecting a total of 110,000 hectares.

Currently, the creation of public protected areas on private land involves high costs and political capital, which hinders these processes due to the system of budgetary restrictions and low priority given to environmental issues.

Therefore, stimulating the creation of private protected areas – even if this means tying this to the legalization process for properties under the provisions of the Forest Code – is one of the few viable options available for expanding the coverage of protected areas providing significant gains in the protection of biodiversity targets.

In addition to encouraging priority compensation, strategies to consolidate and protect the current National System of Protected Areas are required. One action that is currently underway is the strengthening and creation of mosaics and biodiversity corridors in regions close to protected areas.

7 B. Soares-Filho, R. Rajao, M. Macedo, A. Carneiro, W. Costa, M. Coe, H. Rodrigues, A. Alencar. Cracking Brazil's Forest Code. Science, 344 (6182): 363 DOI: 10.1126/Science.1246663, 2014.

WHY RESTORE THE CERRADO?

Over the last five decades, **half of the natural vegetation** in Brazil's Cerrado, the planet's most biodiverse savannah, has been replaced with croplands (especially used to grow soybeans) and cattle ranches. The biome, which accounts for 30% of Brazil's biodiversity, has become the biggest area of expansion for the country's agribusiness industry. Disorderly land use has not taken into consideration its impacts on ecosystem services that the Cerrado provides to Brazil and the world.

Important areas for animals and for the protection of rivers and groundwater recharge have been converted into agricultural areas, eliminating biodiversity corridors. Habitat loss and highly fragmented landscapes are the main threats to 901 endangered animal and plant species[8] in the Cerrado. One in every four endangered animals in Brazil are found in this biome, including large mammals like the maned wolf, giant anteater, tapir and giant armadillo[9].

8 LAHSEN, Myanna; BUSTAMANTE, Mercedes MC; DALLA-NORA, Eloi L. Undervaluing and overexploiting the Brazilian Cerrado at our peril. Environment: science and policy for sustainable development, v. 58, n. 6, p. 4-15, 2016.

9 The Brazil Red Book of Threatened Species of Fauna: Volume I / -- 1. ed. -- Brasília, DF: ICMBio/ MMA, 2018. Available at: http://icmbio.gov.br/portal/images/stories/comunicacao/publicacoes/publicacoes-diversas/livro_vermelho_2018_vol1.pdf. Classifications: maned wolf (VU), giant anteater (VU), tapir (VU) and giant armadillo (VU). Anta is EN in the Cerrado. Source: http://www.icmbio.gov.br/revistaeletronica/index.php/BioBR/article/view/243

© WWF-BRASIL / MARCOS PIOVESAN

The Cerrado is home to more than 12,000 plant species, which over the course of millions of years have specialised in **infiltrating water in large underground reservoirs.** This process depends on native vegetation and it makes the Cerrado a major source of water in Brazil, feeding three important aquifers – Guarani, Bambuí and Urucuia – and eight of the country's 12 main water basins, including the biggest in South America – the Amazon, São Francisco and Plate. Native plants are also responsible for regulating local microclimates and storing around 13.7 billion metric tons of carbon dioxide[10].

It is estimated that the Cerrado contains 3.7 million hectares of degraded Permanent Preservation Areas, including river banks, marshy areas and springs[11]. The restoration of natural vegetation in these areas, through the planting of native species along watercourses and in aquifer recharge areas, is an opportunity to eliminate the environmental liabilities of agricultural production in the biome and to maintain ecosystem services that are essential for the farming sector, such as pollination and water supply. It is a fundamental step towards the biome's conservation, while improving the well-being of everyone who depends on the Cerrado.

Only by restoring vital natural environments on a large scale, by planting native species along watercourses and in aquifer recharge areas, while halting the conversion of the Cerrado, will we be able in the long term **to maintain one of the biggest sources of freshwater for the Brazilian population, as well as animals and plants** that represent 5% of global biodiversity – an asset for the whole of humanity.

> "The restoration of forests in the Cerrado has the **role of correcting** an expansion that **occurred in an incorrect way** over areas that are extremely important from an ecological perspective, harming ecosystem services such as water supply, biodiversity conservation and carbon sequestration."

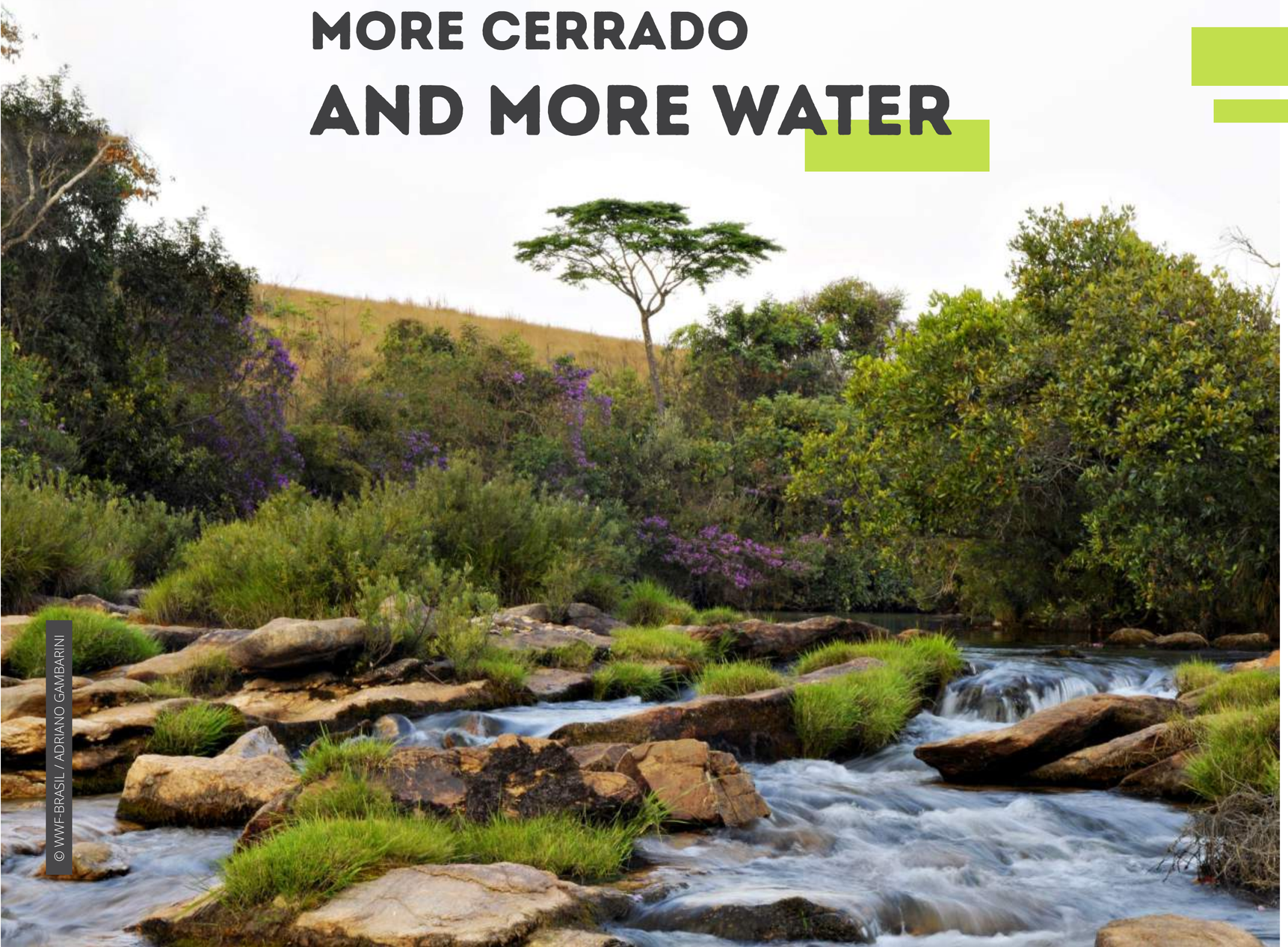
Edegar de Oliveira Rosa

Director of Ecosystem Conservation and Restoration at WWF-Brazil

10 CEPF, 2016. Cited in Manifesto do Cerrado.

11 The Brazilian Foundation for Sustainable Development.

MORE CERRADO AND MORE WATER



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The restoration of the Cerrado in the Pipiripau River Basin, 50 km from Brasília, shows that it is possible **to expand water supply and quality** by planting native species in areas of importance to water resources. Competition for water use was one of the drivers for conservation and sustainable production initiatives that are bringing back native vegetation to the basin, which covers a total area of 23,500 hectares.

The region underwent intense deforestation between 1970 and 1980. Water supply decreased as the land was occupied by farms, while demand for human consumption in urban areas and for crop irrigation increased. The basin provides drinking water for approximately 200,000 people. During the dry season, farms use nearly three times as much water for irrigation as households do, causing water shortages and rationing, which **affect both agricultural production and the population**[12].

12 A experiência do Projeto Produtor de Água na Bacia Hidrográfica do Ribeirão Pipiripau. Editors: Jorge Enoch Furquim Werneck Lima, Alba Evangelista Ramos. Brasília: Adasa, Ana, Emater, WWF Brasil. 2018.

To protect water bodies and expand water supply in the basin, which contains 122 km of watercourses, WWF-Brazil and the Banco do Brasil Foundation worked in partnership with the National Water Agency's Water Producer Programme, supporting long-term forest restoration and soil conservation initiatives together with rural farmers.

Since 2012, **around 300 hectares** of tree cover along water courses and in legally mandated minimum areas of native habitat **have been restored** on 190 rural properties and collective areas in the Pipiripau River Basin[13]. Farmers are paid for environmental services in the restored areas and they receive technical support to implement agroforestry. Part of this work **has been replicated in another three river basins in the Cerrado** – Descoberto (Federal District), Peruaçu (Minas Gerais) and Guariroba (Mato Grosso do Sul).

An economic, social and environmental impact assessment covering 70 rural properties, commissioned by WWF-Brazil and carried out by researcher Henrique Marinho Leite Chaves, indicates that the implementation of all these social and water conservation measures and reforestation could add 75 litres per second to the Pipiripau River's average flow (enough to supply 75,000 people) by 2027. This environmental service would generate economic benefits worth R$24.9 million[14] due to greater water quantity and quality, saving money for the local water and sewerage company, Caesb, and water consumers. Increased water supply is already starting to be perceived by farmers and technicians working in the region.

"The Federal District experienced a two-year water crisis, which led to one year of water rationing, while the people supplied by the Pipiripau River only experienced **one week of rationing** and the impact on irrigated crops was minimal", says Rossini Ferreira Matos Sena, a water resources specialist at the National Water Agency (ANA).

> Ecological restoration, one of the techniques we are applying in the Pipiripau River Basin, is aimed at getting the restored vegetation to be as close as possible to the Cerrado's natural composition in that region. That is the only way we can maintain nutrient cycling, aquifer recharge, water quality, pollination, carbon sequestration and wildlife attraction functions."
>
> **Vinícius Pereira**
> Conservation Analyst at WWF-Brazil

According to impact assessment projections, **another 75,000 people** will have access to water during the dry season if forest restoration and soil conservation initiatives in the Pipiripau River Basin are maintained between now and 2027.

© WWF-BRASIL / EDUARDO AIGNER

13 National Water Agency (ANA), 2019.

14 WWF-Brasil. 2018 study. AVALIAÇÃO DE IMPACTO ECONÔMICO E SOCIOAMBIENTAL NA SUB-BACIA DO PIPIRIPAU (Federal District and Goiás).

SEED
OF A SUSTAINABLE LOCAL ECONOMY

Increased trade in seeds for use in restoring native vegetation can boost the incomes of families who live off the Cerrado's natural resources. The Cerrado Seed Network (RSC) promotes the seed production chain and restoration of the biome. In 2018, it supplied **8 metric tons of seeds of 70 species** for native vegetation restoration projects. They were collected by 60 small farming families and a quilombola community (a group of descendants of runaway slaves) in seven municipalities in the Chapada dos Veadeiros region of Goiás, who were paid R$140,000 in all.

All the income generated is passed on to the seed collectors, who are paid in line with the number and species collected. For example, seeds of jatobá and cajuzinho do Cerrado yield R$12 and R$10 per kilogram, respectively, and there are also possible additional financial gains from the sale of jatobá flour and pulp. Other seeds, which are harder to obtain, such as those of ipê trees, can generate as much as R$100 per kilogram.

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Seed collection training held in April 2018 in the Quilombola-kalunga Territory in Vão do Moleque, Cavalcante, Goiás.

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RSC offers technical support to seed collectors from the Chapada dos Veadeiros region who organised themselves collectively by establishing the Cerrado de Pé Association in 2017. As well as selling seeds, RSC provides its members with training in areas related to the habitat restoration market, such as seed collection, processing and storage techniques. In partnership with WWF-Brazil, RSC is training other groups of collectors, including one in the rural community of Pipiripau, to meet requirements for seeds to restore native vegetation in the basin.

Thanks to efforts to restore vegetation and collect seeds in the Cerrado, it is hoped that the ecosystem's unique native species will not become extinct in the long term and vanish forever. Re-established natural habitats can create areas that connect animal populations that are currently isolated and expand environments favourable to the survival of endangered species. A study reveals that the restoration of important areas, such as biodiversity corridors, could avoid 83% of projected extinctions in the Cerrado[15].

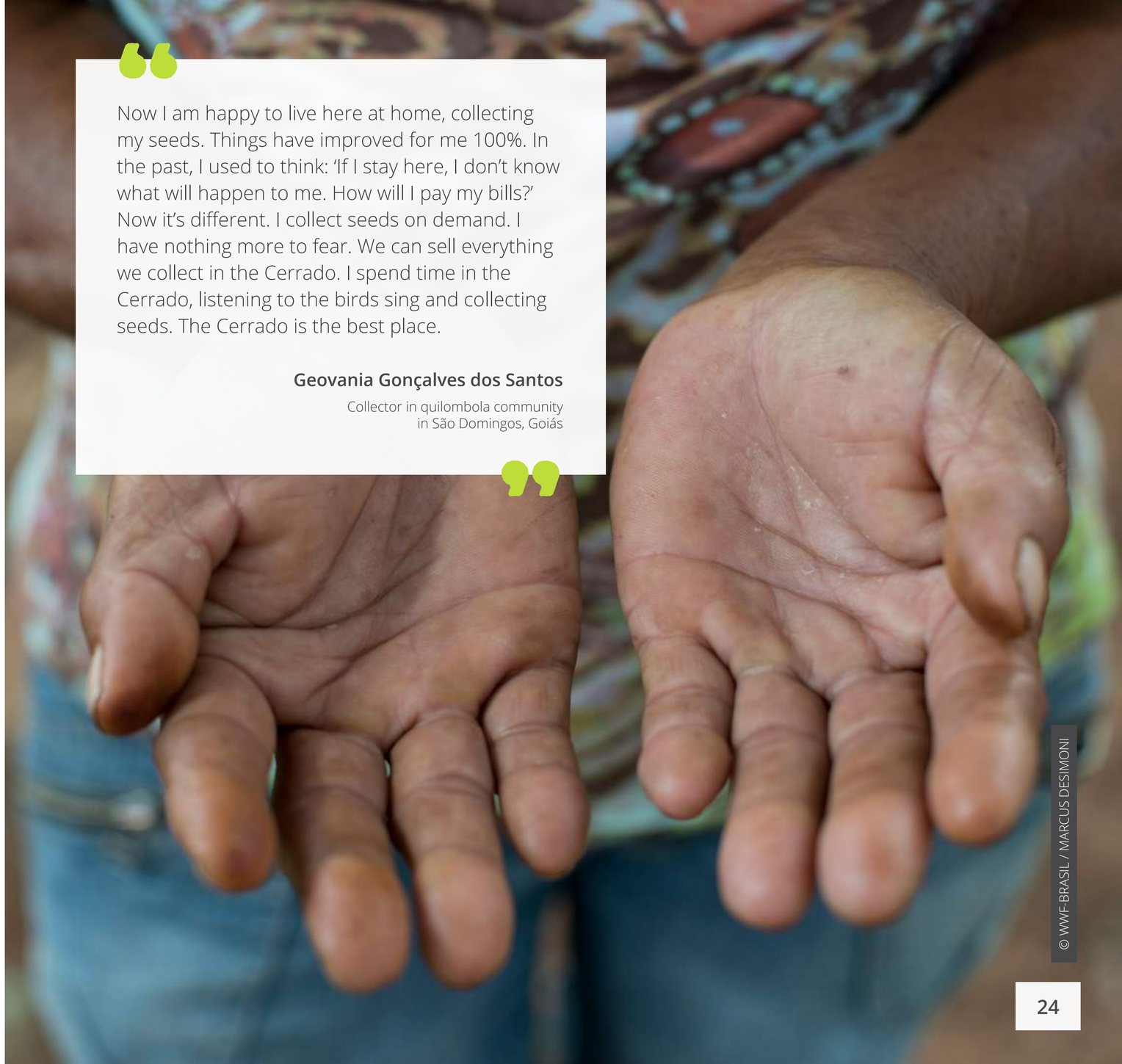
15 STRASSBURG, Bernardo BN et al. Moment of truth for the Cerrado hotspot. Nature Ecology & Evolution, v. 1, n. 4, p. 0099, 2017.

TRANSFORMING
RURAL PEOPLE'S LIVES

Seed collection in the Cerrado is an important source of income for families in kalunga communities, as quilombolas are called in the Chapada dos Veadeiros region of Goiás. Many of these people are in a socially vulnerable situation. Quilombola communities were formed by descendants of African slaves who fled captivity and created villages in remote and very beautiful locations.

These families live off subsistence farming, and most of them do not have electricity and they are far from urban centres. In these communities, the sale of seeds is one of a handful of available income sources. Based on quilombola communities' large areas of conserved natural habitat and in-depth knowledge of the Cerrado, seed collection is a sustainable and promising economic activity, helping to improve their lives, maintain their traditional culture and preserve the Cerrado.

"As the Cerrado is made up of various types of grasses, shrubs and trees that produce seeds at different times, families can **collect them and earn income by selling them almost all year round**", says Camila Motta, Cerrado Seed Network.



> Now I am happy to live here at home, collecting my seeds. Things have improved for me 100%. In the past, I used to think: 'If I stay here, I don't know what will happen to me. How will I pay my bills?' Now it's different. I collect seeds on demand. I have nothing more to fear. We can sell everything we collect in the Cerrado. I spend time in the Cerrado, listening to the birds sing and collecting seeds. The Cerrado is the best place.
>
> **Geovania Gonçalves dos Santos**
>
> Collector in quilombola community
> in São Domingos, Goiás

CONECTING NATIVE HABITAT FRAGMENTS IN THE CERRADO

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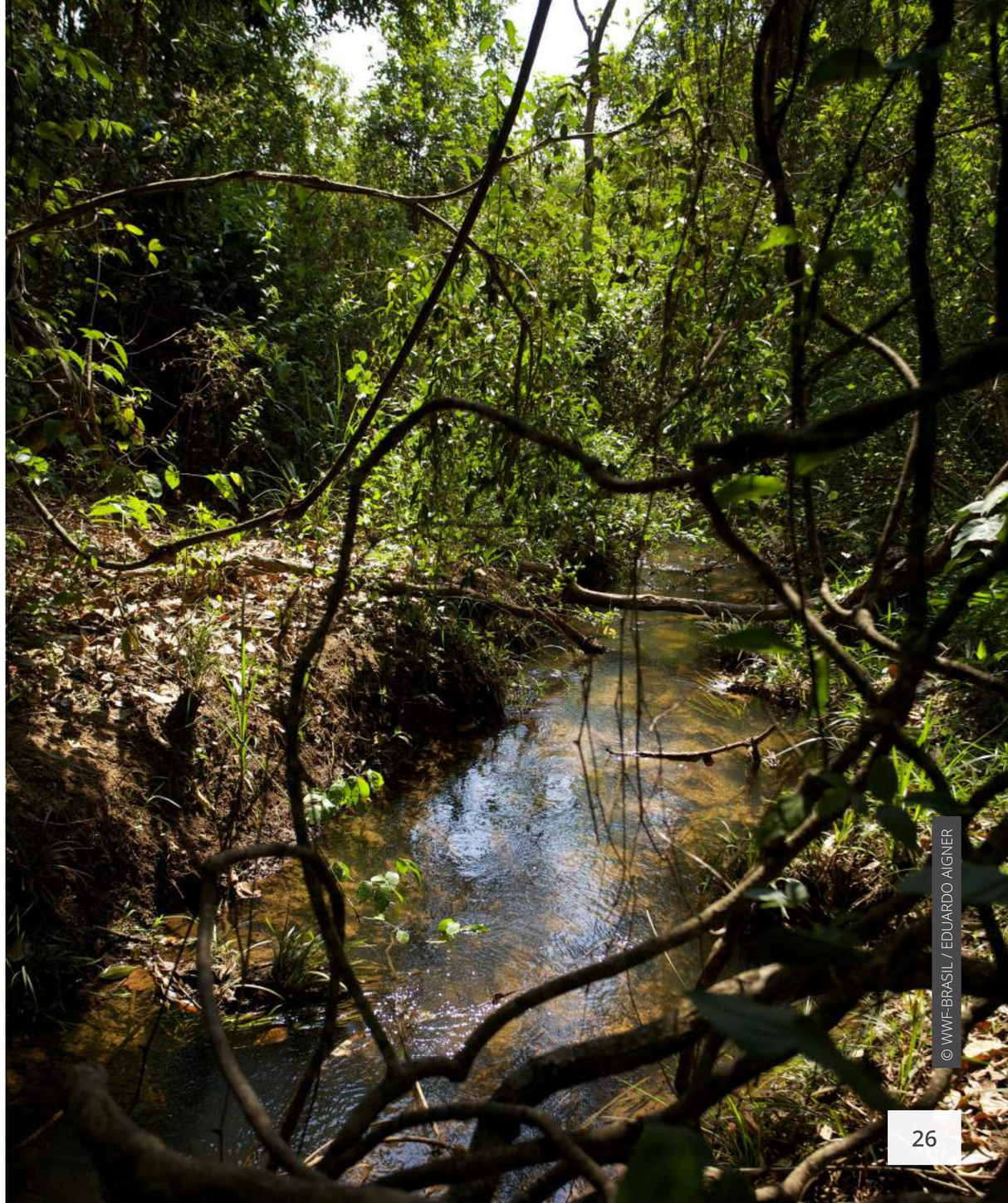
After 50 years of disorderly agricultural expansion across the Cerrado, there are huge environmental liabilities in degraded areas that are important for biodiversity and local people. Specific reforestation technologies for the biome already exist, and restoration needs to be scaled up quickly. WWF-Brazil's goal is **to promote the restoration of the Cerrado's native vegetation** in high-priority areas to re-establish connections between fragments and protect water resources. To increase the speed of ecosystem restoration, it must expand its work and overcome some obstacles, in the following ways:

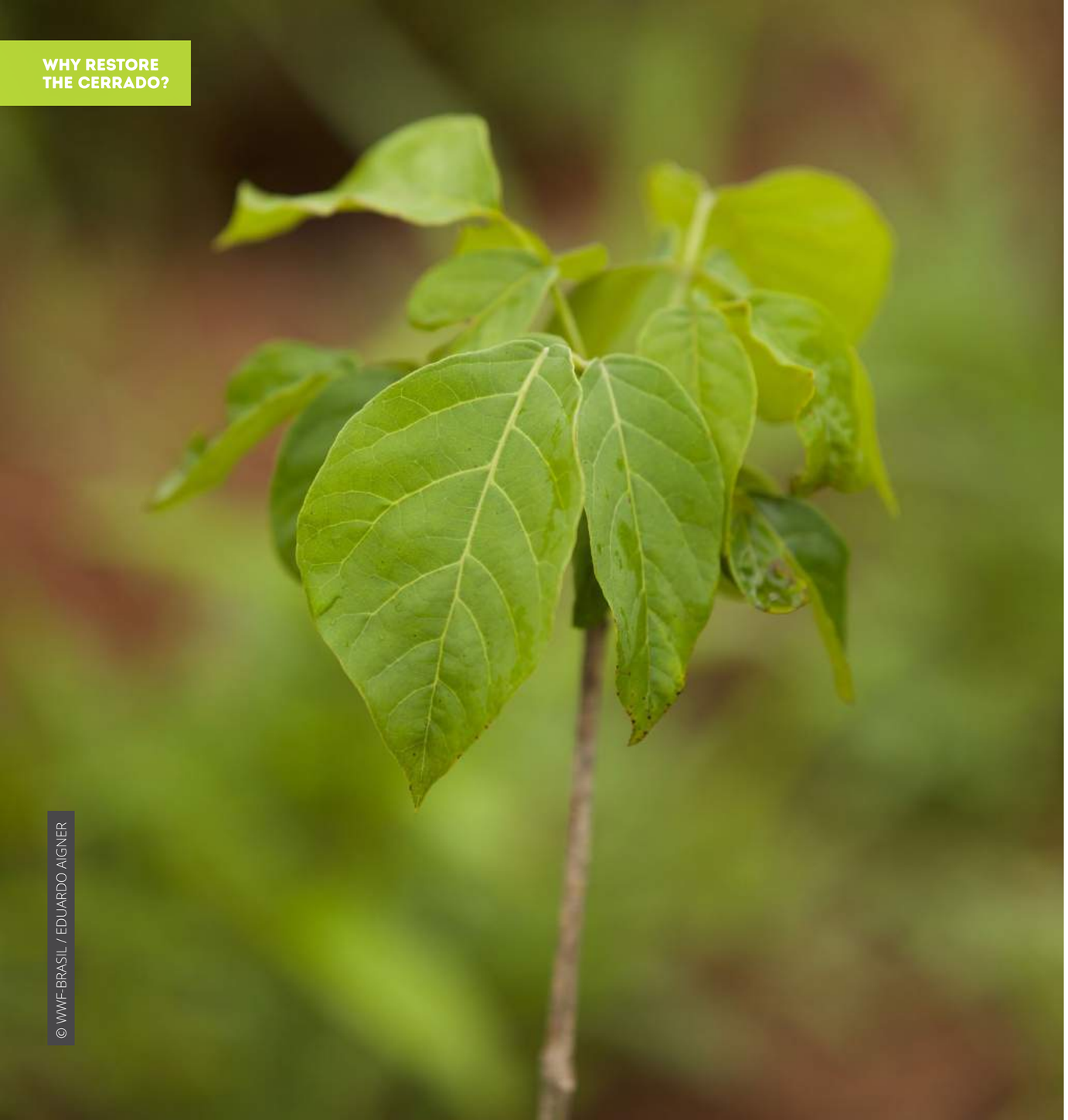
CREATE ATTRACTIVE FINANCIAL MECHANISMS AND EXPAND EXISTING ONES

This is essential to stimulate farmers to invest in the restoration of native vegetation in strategic areas **to reduce the fragmentation of the ecosystem and to protect water resources.** Current funding initiatives are insufficient to promote the restoration of Cerrado habitats and pay for investments in various items, such as restoration area fencing materials, seeds and saplings, as well as technical support and monitoring after planting. Subsidised loans, mechanisms for offsetting fines and carbon sequestration payments need to be expanded.

WWF-Brazil supports enhancements to public agricultural credit policies and private sector participation to expand the scale of native vegetation restoration in the Cerrado. In 2018, together with Agroícone and other partner organisations, it helped to produce a technical proposal that included forest restoration in the operating cost item in the annual Harvest Plan – the largest source of public sector resources to support agricultural production.

In the private sector, traders, meat packing plants and financial institutions have direct contact with farmers and they can act as catalysts of this process, promoting forest restoration funding to make rural properties compliant with the law, eliminating environmental liabilities in meat and soybean production chains, for example.





STRUCTURE THE PRODUCTION CHAIN TO SUPPLY INPUTS FOR THE RESTORATION OF NATIVE SPECIES

This will make it possible to meet demand to restore 2 million hectares across the Cerrado. This target corresponds to a share of the 12 million hectares to be restored throughout Brazil to meet the voluntary commitment assumed by the country's government under the Paris Agreement.

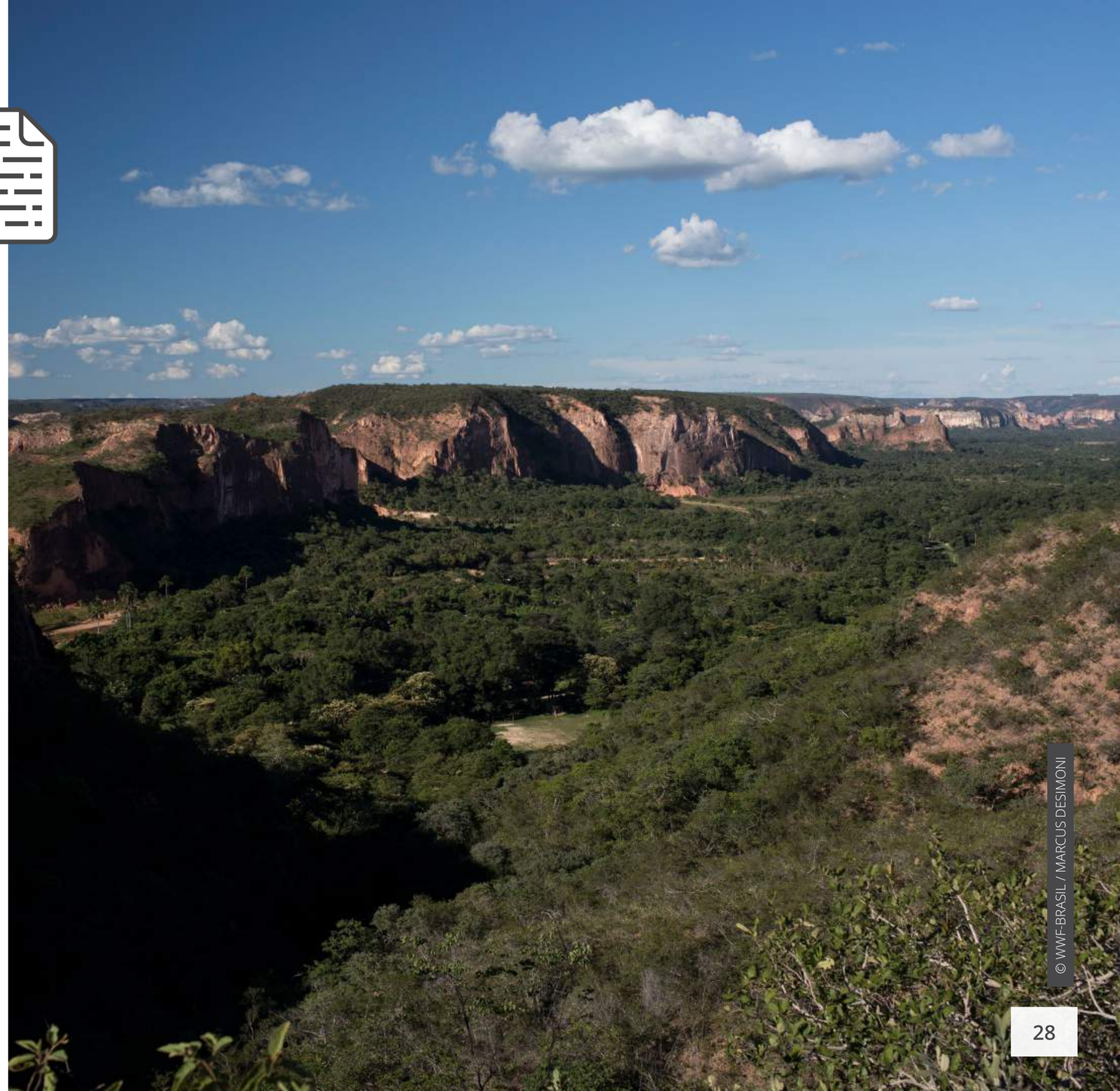
It is necessary to **structure collection networks** to supply seeds of the necessary quantity and quality, and to provide training to produce saplings, collect and process seeds, and apply restoration techniques. Trade in seeds is a sustainable activity that generates income for local communities. As seeds from forest, grassland and savannah specimens are needed, the whole composition of the Cerrado gains from the strengthening of the production chain. The Cerrado Seed Network, a WWF-Brazil partner, has supported traditional communities and small farmers in collecting and selling seeds.

STRENGTHEN THE APPLICATION OF THE FOREST CODE

Enforcement of the law is fundamental for ecosystem services to be restored. The Forest Code states that all private properties with environmental liabilities related to excessive overall deforestation or tree loss in Permanent Preservation Areas must join the Environmental Compliance Programme, which establishes a series of measures to ensure that environmental rules are followed. Among other requirements, a plan for the restoration of degraded areas must be produced. The Environmental Compliance Programme's implementation in rural properties in the Cerrado will enable an increase in the scale of reforestation in the biome while establishing constant demand for inputs, boosting the sustainable production chain involving the restoration of native species.

Expanded restoration of native vegetation in water recharge and fauna connectivity areas such as watercourses and springs is fundamental to guarantee water supply and the conservation of the Cerrado's unique animals and plants[16].

16 STRASSBURG, Bernardo BN et al. Moment of truth for the Cerrado hotspot. Nature Ecology & Evolution, v. 1, n. 4, p. 0099, 2017. WWF-Brasil. 2018 study. AVALIAÇÃO DE IMPACTO ECONÔMICO E SOCIOAMBIENTAL NA SUB-BACIA DO PIPIRIPAU (Federal District and Goiás).



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A PARADOX : CONSERVING NATURE WHILE INCREASING AGRICULTURAL OUTPUT

Brazil has the planet's richest biodiversity, and 60% of its territory is covered in natural habitats. At the same time, it is a leading producer and exporter of soybeans, beef and sugar, among other agricultural products, which generate 23% of the country's gross domestic product[17]. Continuous expansion into remnants of native vegetation has put the country at **the top of the global deforestation ranking.** It is estimated that 40% of growth in global food production will occur in Brazil between now and 2050[18]. This dual status puts the country in a central position regarding the sustainable use of natural resources to increase production while reducing deforestation and its consequences for climate change in the next few decades.

The Cerrado (Brazilian savannah) is the country's main grain and meat production region and major focus of deforestation. Over the last 10 years, it has lost approximately 1 million hectares per annum – more than the Amazon region has lost[19]. Over half of the biome's original area has been converted, and under the current production model, growing demand for food poses a threat to ecosystems that supply around 40% of the country's freshwater and provide habitats for endemic and endangered animals and plants.

17 WWF; Rabobank, 2018. Potencial das regiões brasileiras para expansão dos sistemas de integração Lavoura-Pecuária-Floresta - Análise de Fatores e de Oportunidades para Implementação de Sistemas Integrados.

18 FAO

19 MMA/PRODES, 2017

RESTORATION OF DEGRADED AREAS,

A PROMISING PATH FORWARD

As of 2017, Brazil had 64 million hectares of degraded pastureland, including 24 million hectares or 37% in the Cerrado[20]. The rehabilitation of these areas of open pasture, through the **intensification of cattle raising,** would allow expanded production of commodities alongside forest restoration, reducing pressure to convert native vegetation. As part of the **Paris Agreement**, signed in 2015, the Brazilian government pledged to **rehabilitate 15 million hectares of degraded pasture** and implement another 5 million hectares of integrated production systems as a strategy to cut national greenhouse gas emissions between now and 2030.

A consistent body of research concludes that Brazil could increase its meat and grain output without deforesting any more land. The use of degraded pasture areas in the Cerrado could meet all demand for food production foreseen for the biome without the need to convert new natural areas and it would also reduce the country's greenhouse gas emissions. The formula for conserving the Cerrado involves a commitment to zero conversion and the harnessing of degraded areas through four large-scale measures: **intensifying cattle raising** through better management of pastureland, taking into consideration soil conservation; focusing the expansion of soybean production on **already-cleared areas;** implementing **integrated systems** to use natural resources more effectively; and increasing the **restoration of native vegetation.**

20 *Lapig/UFG, 2017. Atlas digital das pastagens brasileiras. Based on 2017 data: pastureland in Brazil: 178.7 million ha; degraded pastureland in Brazil: 63.7 million ha; pastureland in the Cerrado: 62 million ha; and degraded pastureland in the Cerrado: 23.7 million ha*

Agriculture is a major source of greenhouse gas emissions, accounting for 24% of Brazil's total emissions in 2017[21].

21 *SEEG; Climate Observatory, 2018. SEEG Coleção 6 – Estimativas de Emissões de Gases de Efeito Estufa do Brasil 1970 – 2017. Available at: http://www.observatoriodoclima.eco.br/wp-content/uploads/2018/11/PPT-SEEG-6-LANCAMENTO-GERAL-2018.11.21-FINAL-DIST-compressed.pdf*

A PARADOX: CONSERVING NATURE WHILE INCREASING AGRICULTURAL OUTPUT

Nearly **40% of pastureland in the Cerrado, or 24 million hectares, is degraded**[22]. This represents a large area suitable for agriculture that is being wasted while new areas of native vegetation are converted. Strassburg et al. (2014) reveal that increasing the productivity of pastureland used for cattle raising from approximately 30% to 50% of its potential would free up enough land to handle production growth across the crop farming, meat, forestry and biofuel sectors between now and 2040[23].

By intensifying cattle raising, livestock areas would become more productive, **maintaining the sector's growth in a smaller area,** and a large share of degraded pastureland could then meet the forecast increase in demand for soybean farming in the Cerrado. Intensification experiments on ranches in the Amazon[24] have shown that with the right management, meat production can be four times higher in the same area while **emissions can be 90% lower per kilogram of meat produced,** due to a better carbon balance in the soil through the rehabilitation of pastureland and lower methane gas emissions from animals due to a shortening of their production cycle. This measure also has other environmental benefits, such as **reduced soil erosion and less siltation** of water bodies.

In 2015, soybean crop areas and pastureland in the Amazon and Cerrado were responsible for **67% of the Brazilian agricultural sector's total emissions**[25].

25 *SEEG, 2018. Cited in: Costa Junior, C. et al. COMO A PRODUÇÃO DE COMMODITIES AGROPECUÁRIAS CUMPRIRÁ AS METAS CLIMÁTICAS DO BRASIL NOS BIOMAS AMAZÔNIA E CERRADO? Sustentabilidade em Debate. Imaflora. October 2018.*

© WWF-BRASIL / EDUARDO AIGNER

22 *Lapig/UFG, 2017. Atlas digital das pastagens brasileiras. Based on 2017 data: pastureland in Brazil: 178.7 million ha; degraded pastureland in Brazil: 63.7 million ha; pastureland in the Cerrado: 62 million ha; and degraded pastureland in the Cerrado: 23.7 million ha*

23 *STRASSBURG, B. B. N. et al. When enough should be enough: improving the use of current agricultural lands could meet production demands and spare natural habitats in Brazil. Global Environmental Change, v. 28, p. 84-97, 2014.*

24 *Imaflora. Como boas práticas agropecuárias têm reduzido as emissões de GEE e aumentado a produção de carne na Amazônia / Marina Piatto, Ciniro Costa Junior - Piracicaba, SP: Imaflora, 2016.*

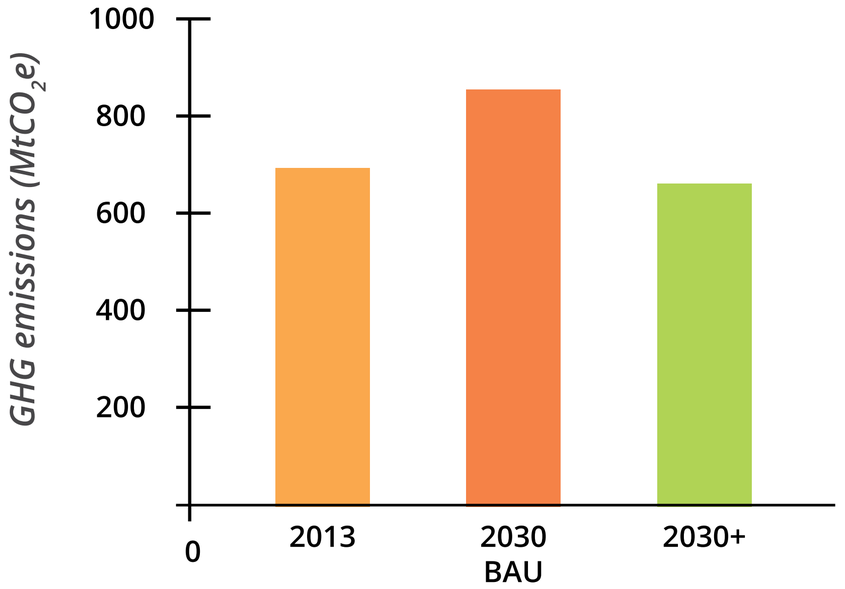
Increasing the productivity of pastureland used for cattle raising from approximately 30% to 50% of its potential would free up **enough land to handle crop and meat production growth between now and 2040**[26].

26 *STRASSBURG, B. B. N. et al. When enough should be enough: improving the use of current agricultural lands could meet production demands and spare natural habitats in Brazil. Global Environmental Change, v. 28, p. 84-97, 2014.*

> The soil is a **finite natural resource** that has been used improperly. Instead of being productive, it is causing environmental impacts, generating emissions, erosion and various other avoidable problems.
>
> **Edegar de Oliveira Rosa**
> Director of Ecosystem Conservation and Restoration at WWF-Brazil

MORE PRODUCTION
AND LESS EMISSIONS

The restoration of degraded areas and large-scale application of practices with low carbon emissions in Brazil **could mitigate 50% of the farming sector's emissions between now and 2030**[27].If these urgently needed changes to agricultural production do not happen, however, the sector's emissions in Brazil **will increase by 30%,** especially in the areas of meat and agricultural commodities, reaching 670 million metric tons of carbon dioxide equivalent, or **70% of all greenhouse gas emissions projected for the country in 2030** (1,000 MtCO2e), not including emissions arising from deforestation. This increase is estimated in line with a business-as-usual scenario, involving herd expansion, a greater size of degraded pastureland and increased use of synthetic nitrogen fertilisers.



Source: Imaflora. O caminho para a agropecuária brasileira: maior produção com menos emissões. Boletim Clima. October 2015.

If low-carbon farming practices are scaled up, the agricultural sector alone **will account for 70%** of Brazil's total projected greenhouse gas emissions by 2030.

27 IImaflora. O caminho para a agropecuária brasileira: maior produção com menos emissões. Boletim Clima. October 2015.

STIMULATING THE LARGE-SCALE REHABILITATION OF PASTURELAND

The creation and expansion of **financial mechanisms** is vital for the **rehabilitation of degraded pastureland to gain scale** in the Cerrado. As well as working with partners to classify pastureland degradation levels in the Cerrado, WWF-Brazil is striving to rehabilitate **10 million hectares by 2030.** This will generate a drastic change in current ecosystem conversion indicators and it will be a major step forwards for the consolidation of low-carbon agriculture. Existing technologies are already proven to produce environmental benefits, better yields and higher income, but their **adoption by farmers is hindered by initial transition costs** and limited access to available credit lines.

AGRICULTURE THAT IS EFFICIENT FOR THE CLIMATE

Developing the **low-carbon agricultural chain** in the Cerrado requires large-scale expansion of the use of **integrated crop farming, cattle raising and forestry systems.** This cultural production strategy harmonises different production systems in the same area, improving soil quality and boosting carbon sequestration.

It is estimated that Brazil has 11.5 million hectares of these integrated systems, mainly involving crops and cattle raising[28]. Between 2010 and 2015, this area grew by 5.96 million hectares, **achieving the target in the Low-Carbon Agriculture Plan** and leading to the sequestration of 21.8 million metric tons of carbon dioxide equivalent[29]. The Cerrado possesses areas suited to **the adoption of these integrated systems and it will play a strategic role in achieving Brazil's targets for Nationally Determined Contributions** (NDC) under the Paris Agreement, which entail an additional 5 million hectares of integrated systems by 2030.

An exploratory study conducted by WWF-Brazil in partnership with Rabobank found that four states in the Cerrado **– Mato Grosso, Mato Grosso do Sul, Goiás and Minas Gerais – have the most potential to implement integrated systems.** Data was produced through spatial modelling of samples of Brazilian biomes and qualitative analysis. In interviews, farmers revealed that **soil recovery, higher productivity and income gains** were the main reasons for the adoption of integrated systems.

More than 80% of integrated farming systems in Brazil only involve crops and cattle. Although these partial systems bring about benefits, it is fundamental to move towards adopting the whole system. **The inclusion of the forest component expands environmental and climate gains,** such as higher carbon sequestration capacity.

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28, 29 Embrapa. ILPF em números. Available at: https://ainfo.cnptia.embrapa.br/digital/bitstream/item/158636/1/2016-cpamt-ilpf-em-numeros.pdf

MORE CREDIT FOR LOW-CARBON AGRICULTURE

Larger volumes of resources for farmers to rehabilitate pastureland and lower interest rates were among the positive outcomes of efforts led by WWF-Brazil in partnership with Agroícone involving the agriculture, finance and environment ministries. Economic and technical studies underpinned improvements to agricultural credit in the Low-Carbon Agriculture Programme, the main source of rural credit to support low-carbon agriculture in Brazil.

As a result of this work, **the credit limits available to farmers in the programme nearly doubled,** from R$2.2 million to R$5 million, allowing access to larger projects. In addition to pastureland rehabilitation, resources may be used for investments in integrated farming systems, soil improvements and farmers' compliance with environmental regulations, involving the restoration of native vegetation in Permanent Preservation Areas and legally mandated minimum areas of native habitat.

However, the credits available for investment in low-carbon agricultural practices are much lower than the amounts assigned for operating costs. Between 2017 and 2018, the Low-Carbon Agriculture Programme received just over 1% of the Harvest Programme's budget – the biggest public source of funding for agricultural production and sales[30].

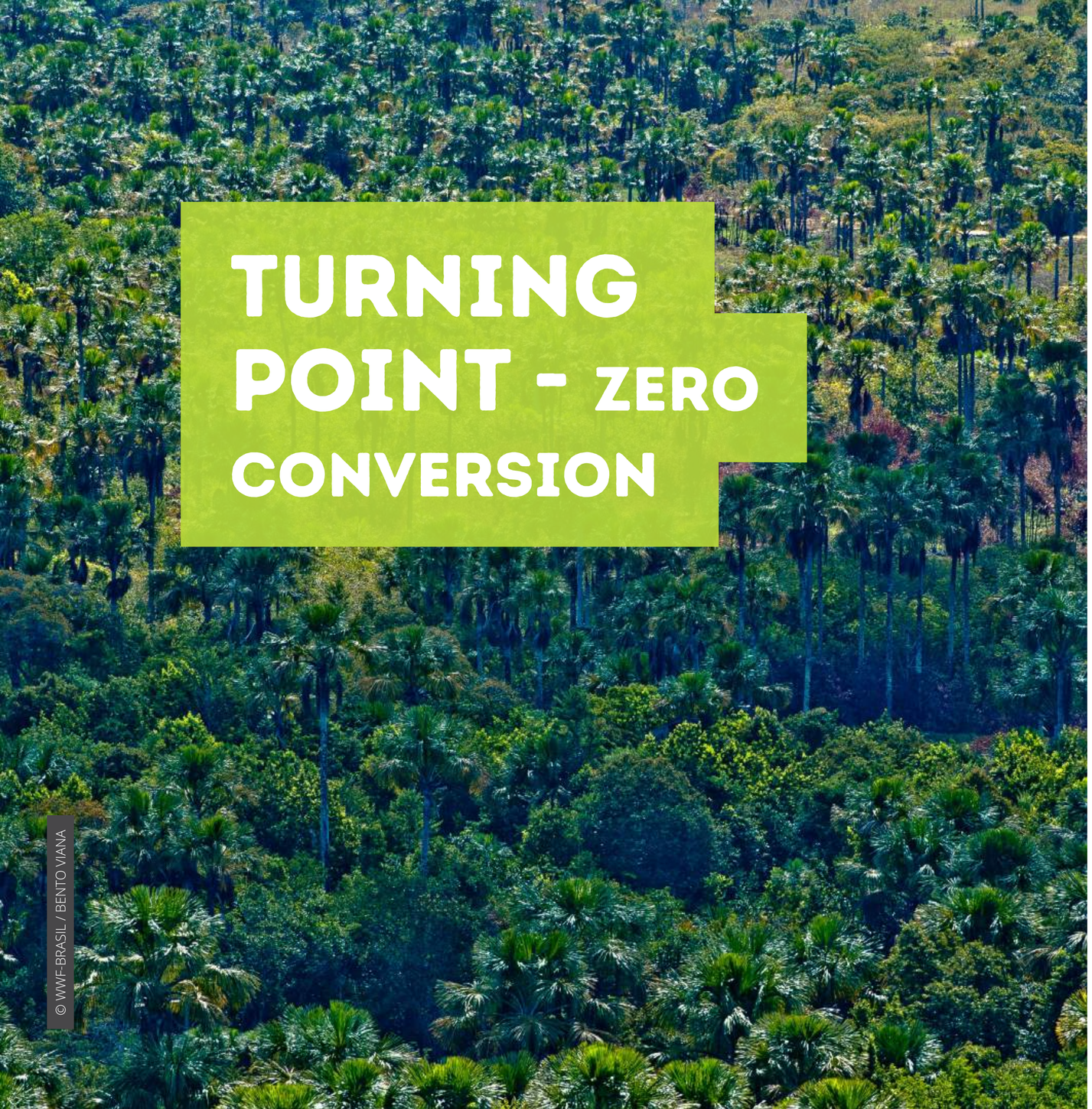
> "Through technical analyses and the participation of stakeholders in different sections of society, it is possible to improve agricultural policy and thereby encourage the sustainability of Brazilian agriculture, **combining production with conservation of natural capital.** In addition, thanks to these new credit conditions, we will be able to measure farmers' interest in loans that allow them to finance activities that contribute to climate mitigation and adaptation."
>
> **Leila Harfuch**
> Gerente Geral da Agroícone

Another form of financing is through supply chain mechanisms, for example when a trader or a meat packing company finances the process of production diversification through an integrated crop farming, cattle raising and forestry system or livestock farming intensification. WWF-Brazil seeks dialogue with these sectors so that private funding expands the resources available for the rehabilitation of currently degraded pastures in the Cerrado.

30 Calculation base: The Harvest Programme's total budget was R$188.5 billion and the Low-Carbon Agriculture Programme's budget was R$2.13 billion. Source: Observatório ABC. Análise dos Recursos do Programa ABC – Safra 2016/17.

HOW TO MAKE THE TRANSITION

The agricultural sector's transition also requires **strengthened technology transfer and training programmes** for farmers to ensure that these technical tools reach the fields. In the case of cattle raising, as well as financial mechanisms, technology transfer is especially important for ranchers who are still working with extremely low productivity levels, namely less than one animal per hectare. **Traders and meat packing plants have a direct connection with the supply chain and farmers, and they can be strategic players** in engaging and disseminating technical management information, promoting large-scale action.



TURNING POINT - ZERO CONVERSION

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Brazil has become one of the world's biggest commodity exporters thanks to the spread of production in the Cerrado (Brazilian savannah). Over the last 50 years, **half of the planet's most biologically diverse savannah has been converted into pastureland and monoculture areas,** leaving the landscape highly fragmented. It is possible to reconcile agricultural production with conservation of the Cerrado, but to achieve this, the expansion into natural ecosystems must stop. For more than 10 years, the pace of deforestation in the Cerrado has been the highest in the country, and if the present rate of approximately 1 million hectares per year continues, **the entire biome could vanish by 2050[31].**

The disorderly expansion of cattle raising and crop farming has displaced habitats that are essential for plants and animals, and locations responsible for hydrological and climate regulation, besides triggering the degradation of water courses through siltation and the intensive use of pesticides[32]. A study found that river flows decline following the conversion of native areas into vast fields and pastureland[33]. This situation also poses a threat to traditional peoples and communities, who use the Cerrado sustainably and may be exposed to **conflicts with agribusiness** for the use of land and water.

31 STRASSBURG, Bernardo BN et al. Moment of truth for the Cerrado hotspot. Nature Ecology & Evolution, v. 1, n. 4, p. 0099, 2017. Cited in The Cerrado Manifesto.

32 MOREIRA, Josino Costa et al. Contaminação de águas superficiais e de chuva por agrotóxicos em uma região do estado do Mato Grosso. Ciência & Saúde Coletiva, v. 17, p. 1557-1568, 2012. Available at: https://www.scielosp.org/article/csc/2012.v17n6/1557-1568/pt/

33 TNC. (2016). Boas Práticas Agrícolas e Água: Guia para a conservação dos recursos hídricos nas propriedades rurais do Oeste da Bahia. The Nature Conservancy. Available at: https://www.nature.org/media/brasil/oeste-bahia.pdf

The Cerrado, considered a biodiversity hotspot, **is home to one in four endangered fauna species in Brazil[34].** Projections for 2050 indicate that the continued conversion of native vegetation for agricultural production could lead to **the biggest extinction of plant species in history,** involving three times more flora losses than there have been since 150035. Around 480 plant species would vanish, and there would be repercussions for ecosystem services, affecting the farming sector itself[36] and **jeopardising Brazil's water security** as well as the planet's climate[37].

This is a crucial moment for the Cerrado's survival. Expected growth in soybean production in the next decade could be channelled to around 40 million hectares of already-cleared areas – enough to cope with forecast expansion for the next 50 years[38], without any deforestation. The stance taken by traders, global retailers and meatpackers to exclude deforestation from supply chains and **strengthen public policies and incentives for conservation,** if adopted on a large scale, could also **prevent irreparable losses** to biodiversity and ecosystem services for Brazil and the world.

© WWF-BRASIL / BENTO VIANA

34 The Brazil Red Book of Threatened Species of Fauna: Volume I / -- 1. ed. -- Brasília, DF: ICMBio/MMA, 2018. Available at: http://www.icmbio.gov.br/portal/images/stories/comunicacao/publicacoes/publicacoes-diversas/livro_vermelho_2018_vol1.pdf. Calculation base: 1,173 endangered fauna species in Brazil, including 288 in the Cerrado.

35 STRASSBURG, Bernardo BN et al. Moment of truth for the Cerrado hotspot. Nature Ecology & Evolution, v. 1, n. 4, p. 0099, 2017.

36 STRASSBURG, Bernardo BN et al. Moment of truth for the Cerrado hotspot. Nature Ecology & Evolution, v. 1, n. 4, p. 0099, 2017.

37 The Cerrado Manifesto.

38 Carneiro Filho, A. e Costa, K. (2016). A expansão da soja no Cerrado: Caminhos para a ocupação territorial, uso do solo e produção sustentável. Cited in the Cerrado Manifesto.

THREE ESSENCIAL SERVICES
FOR HUMANITY

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WATER

The Cerrado functions as **Brazil's "water tank".** Its complex ecological system, which evolved over the course of roughly 40 million years, has created vegetation adapted to the acidic, nutrient-poor soil and dry climate. Thin-rooted grasses that bring water down into the soil work together with deep, abundant-rooted shrubs and trees, which act as channels for underground storage[39], keeping **three aquifers and eight of Brazil's 12 hydrographic regions charged with water.** The Cerrado is located in the centre of Brazil, and conserving it is essential to the stability and functioning of the surrounding ecosystems – the Pantanal Wetlands, Amazon Rainforest, Caatinga Shrublands and Atlantic Forest – which receive its waters[40]. Not including the Amazon, **43% of available surface water in Brazil comes from the Cerrado**[41].

39 Based on information from interview with Alexandre Sampaio, of ICMBio.

40 LAHSEN, Myanna; BUSTAMANTE, Mercedes MC; DALLA-NORA, Eloi L. Undervaluing and overexploiting the Brazilian Cerrado at our peril. Environment: science and policy for sustainable development, v. 58, n. 6, p. 4-15, 2016. Available at: https://www.researchgate.net/publication/311101907_Desvalorizando_e_Superexplorando_O_Cerrado_Brasileiro_Por_Nossa_Conta_e_Risco_-_Portuguese_translation_of_Overexploiting_and_Undervaluing_the_Brazilian_Cerrado_at_Our_Peril

41 STRASSBURG, Bernardo BN et al. Moment of truth for the Cerrado hotspot. Nature Ecology & Evolution, v. 1, n. 4, p. 0099, 2017.

BIODIVERSITY

Due to its high degree of endemism, each fragment of the Cerrado is important. The diversity of savannah, forest and grassland landscapes has created a multitude of habitats with specific ecological interactions, featuring species that only live in these locations. The biome is home to **5% of the planet's biodiversity and 30% of Brazil's species**. There are 12,000 plant species[42], an asset not yet fully known, with the potential to drive a sustainable development model for the biome, which could help to solve many of humanity's problems. Studies have identified **plants that can treat diseases or be used in cosmetics, as well as highly nutritious ones** like pequi, buriti, bar and araticum[43]. Thousands of traditional peoples and communities base their way of life on the use of fruits, seeds, nuts and other natural assets of the Cerrado. However, due to the rapid loss of natural habits, 901 animal and plant species are at risk of extinction in the biome[44].


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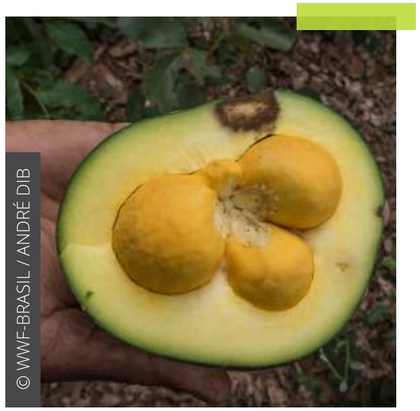
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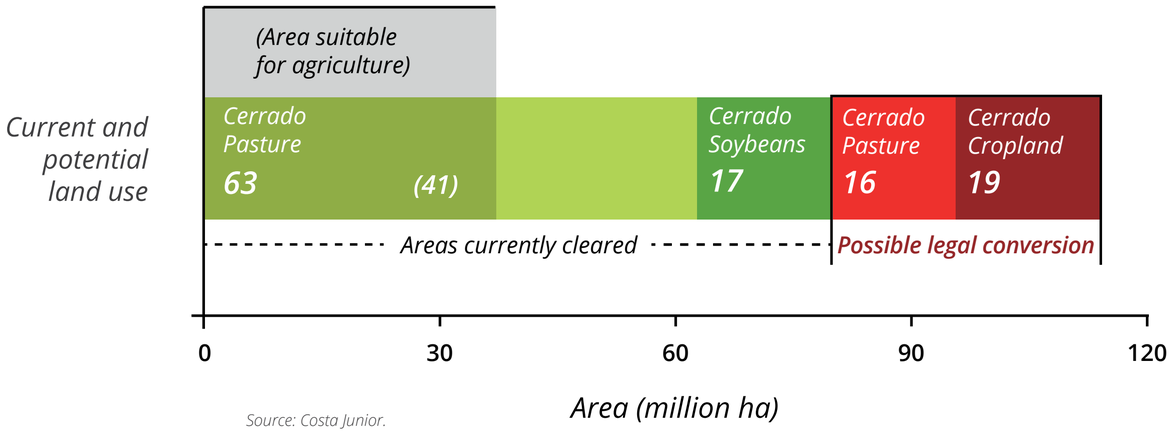
42 CEPF. Resumo do Perfil do Ecossistema Cerrado.

43 Imaflora. Levantamento de e seus benefícios para a saúde; https://www.unicamp.br/unicamp/sites/default/files/jornal/paginas/ju_637_paginacor_11_web.pdf; https://www.unbciencia.unb.br/biologicas/104-ciencias-biologicas/355-pequi-tem-propriedades-medicinais; http://faesfpi.com.br/revista/index.php/faesf/article/view/24;

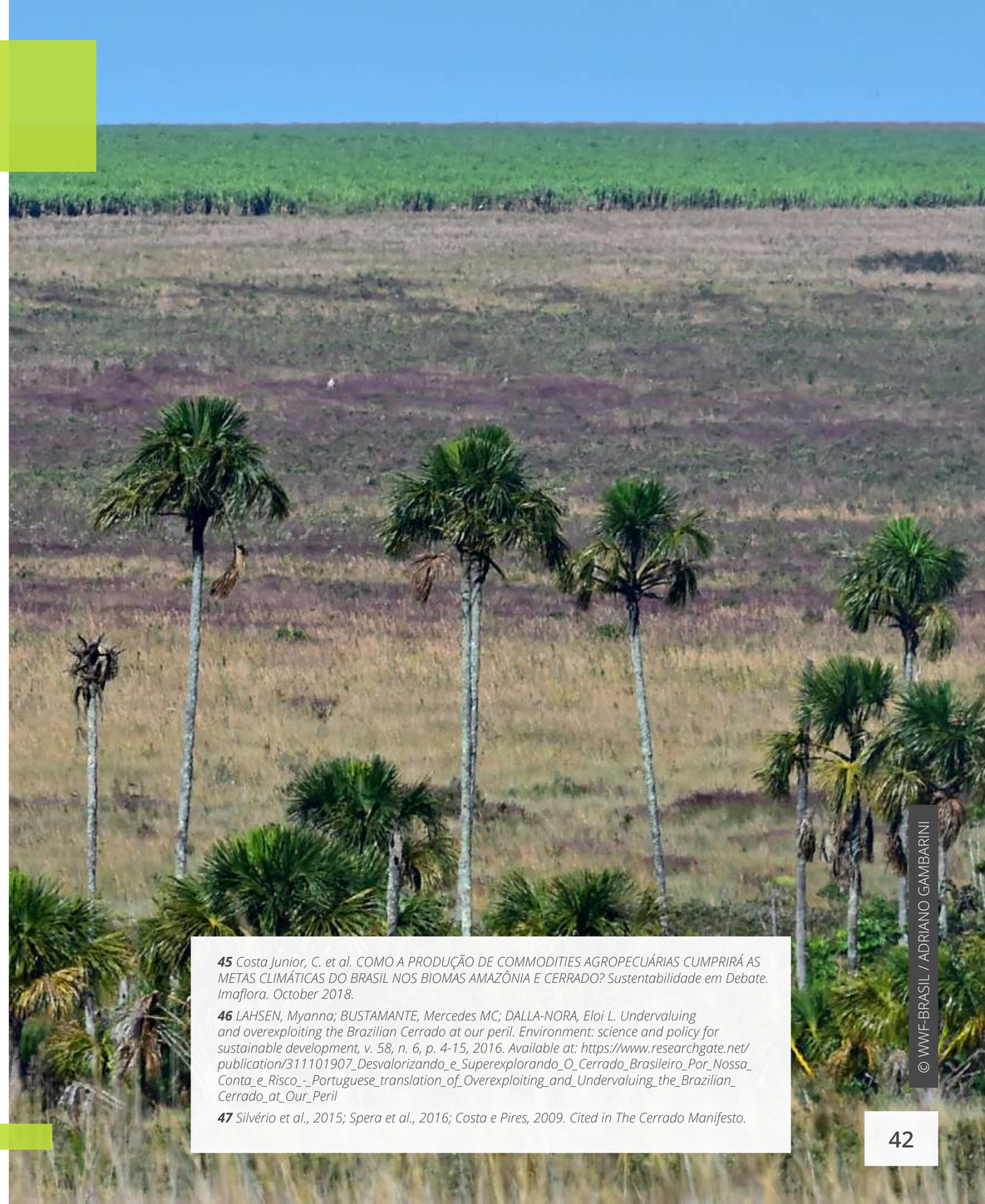
44 LAHSEN, Myanna; BUSTAMANTE, Mercedes MC; DALLA-NORA, Eloi L. Undervaluing and overexploiting the Brazilian Cerrado at our peril. Environment: science and policy for sustainable development, v. 58, n. 6, p. 4-15, 2016.

CLIMATE REGULATION

The Cerrado contains **a significant carbon stock**, estimated at 13.7 billion metric tons of carbon dioxide (including biomass above ground and some of its biomass below ground). If released into the atmosphere, it would represent almost 30% of 2017's global emissions, accelerating climate change. Around 70% of Brazil's emissions arise from changes in land use and agricultural activities[45]. Thus, **halting the conversion of the Cerrado's natural vegetation will avoid emissions in Brazil** and help the country to meet its voluntary commitment under the Climate Convention. Native vegetation also contributes to regional climate regulation[46], and its conversion could lead to changes in rainfall patterns[47].



Source: Costa Junior.



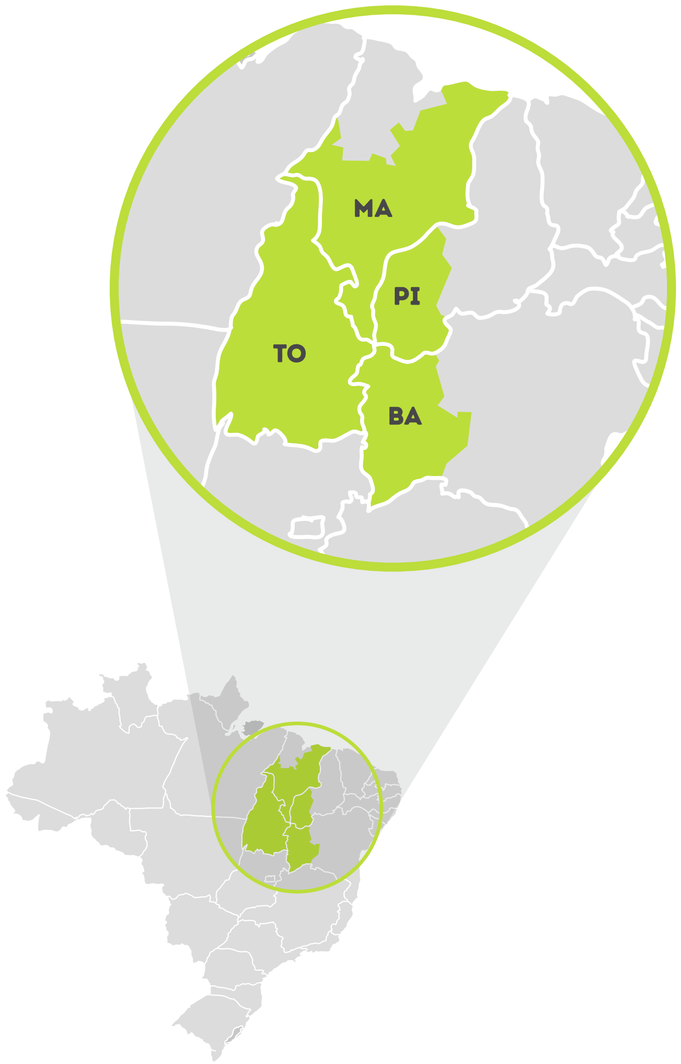
© WWF-BRASIL / ADRIANO GAMBARINI

45 *Costa Junior, C. et al. COMO A PRODUÇÃO DE COMMODITIES AGROPECUÁRIAS CUMPRIRÁ AS METAS CLIMÁTICAS DO BRASIL NOS BIOMAS AMAZÔNIA E CERRADO? Sustentabilidade em Debate. Imaflora. October 2018.*

46 *LAHSEN, Myanna; BUSTAMANTE, Mercedes MC; DALLA-NORA, Eloi L. Undervaluing and overexploiting the Brazilian Cerrado at our peril. Environment: science and policy for sustainable development, v. 58, n. 6, p. 4-15, 2016. Available at: https://www.researchgate.net/publication/311101907_Desvalorizando_e_Superexplorando_O_Cerrado_Brasileiro_Por_Nossa_Conta_e_Risco_-_Portuguese_translation_of_Overexploiting_and_Undervaluing_the_Brazilian_Cerrado_at_Our_Peril*

47 *Silvério et al., 2015; Spera et al., 2016; Costa e Pires, 2009. Cited in The Cerrado Manifesto.*

WHY CONVERSION URGENTLY NEEDS TO BE ELIMINATED



Most of the expansion in the production of soybeans and other commodities is already taking place on pastureland, but in order to stop deforestation, the scale of usage of already cleared areas needs to increase.

In recent years, the Cerrado has experienced **more deforestation than anywhere else in Brazil,** and it is happening rapidly in the Matopiba region, located between the states of Maranhão, Tocantins, Piauí and Bahia. Restrictions imposed by traders and retailers on purchases of soybeans grown in deforested areas are fundamental to signal that buyers will not accept the Cerrado's conversion and to accelerate the transition to a zero-deforestation supply chain.

Zero conversion of native vegetation is especially important in Matopiba, considered the country's latest agricultural frontier. Soybean production is displacing native vegetation there **due to low land prices and the crop's high profitability**, among other factors. Between 2001 and 2015, the number of municipalities in the region in which soybeans are grown more than doubled[48].

48 Barbirato, Felipe E.L.; Souza, Lisandro I. de. Matopiba: A expansão da agricultura em remanescentes de vegetação nativa de bioma Cerrado. Sustentabilidade em Debate. N. 7, June 2018.

49, 51 Carneiro Filho, A. e Costa, K. (2016). A expansão da soja no Cerrado: Caminhos para a ocupação territorial, uso do solo e produção sustentável. Cited in The Cerrado Manifesto.

50 Silvério et al., 2015; Spera et al., 2016; Costa e Pires, 2009. Citados no Manifesto do Cerrado.

Despite the availability of previously cleared areas in the central-south portion of the Cerrado, soybean production increased by over 250% in the Matopiba[49] region between 2000 and 2014. This occurred through the conversion of native vegetation, which represented 62% of this growth[50]. In just seven years, between 2009 and 2015, **the region lost about 2 million hectares of Cerrado vegetation cover**[51]. This expansion is happening in a disorderly manner, with Cerrado vegetation being converted even in areas that are not suitable for agricultural activities.

> Farmers **lose productivity and profits, while the environment is harmed**, given that lower production efficiency will lead new areas of natural vegetation to be converted. Furthermore, the loss of nutrients and siltation of rivers **harm biodiversity, production and communities**, which depend on affected water resources.
>
> **Edegar de Oliveira Rosa**
> WWF-Brazil's Director of Ecosystem Conservation and Restoration

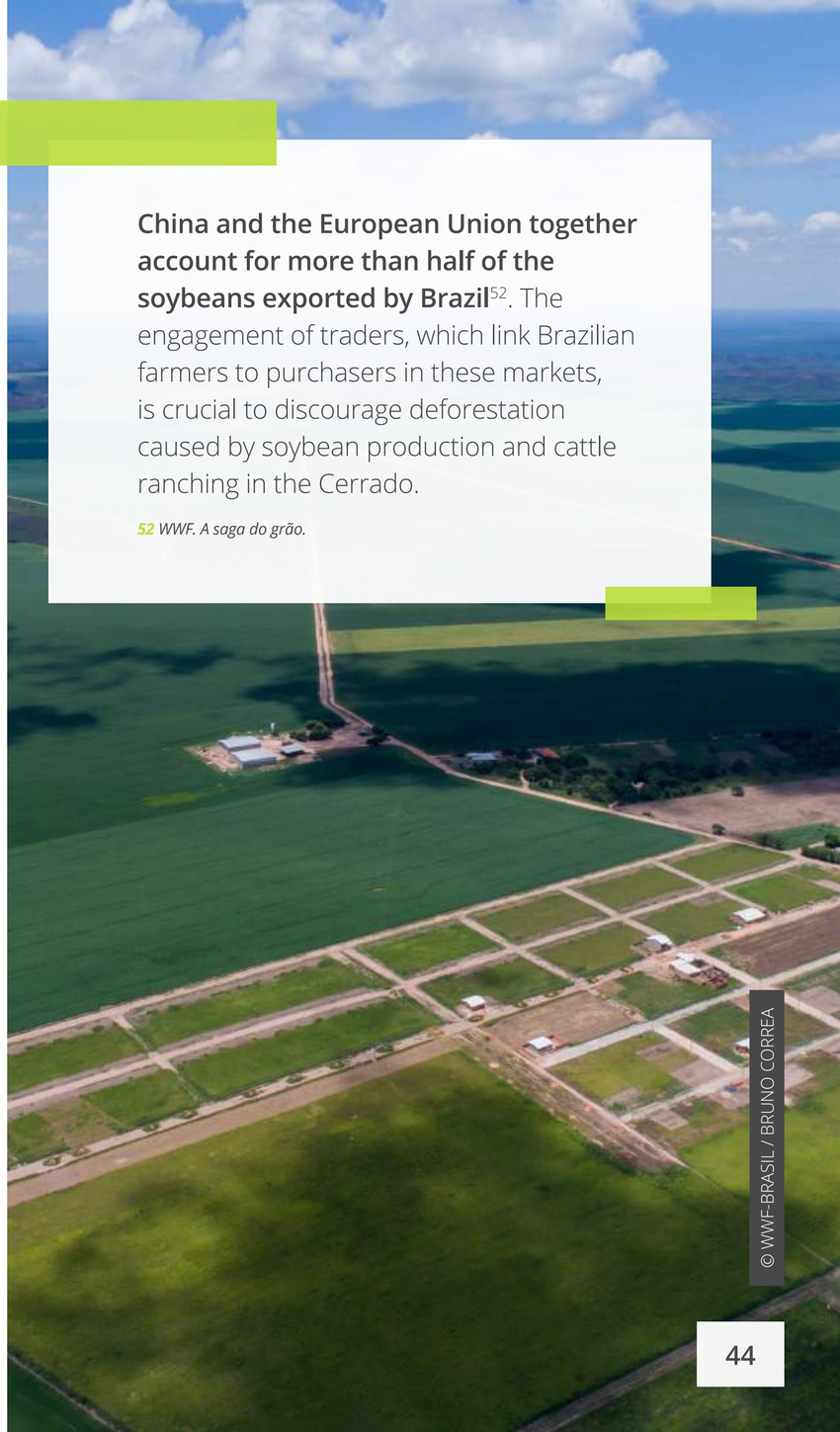
MARKET SIGNALS DESIRE FOR CONVERSION-FREE SUPPLY CHAIN

The meat and soybean consumer market is one of the main drivers of the Cerrado's future, and a significant part of this sector is beginning to show that it wants deforestation-free products. More than 135 global companies have already signed the SoS Manifesto, which is a declaration of support for the **Cerrado Manifesto**. Written by 60 organisations and researchers, and launched in September 2017, this document calls for an end to the biome's conversion.

In a similar move, the China Meat Association and 64 leading global companies, which represent more than half of the Chinese meat production, processing and import market, signed **the Sustainable Meat Declaration**. This document sets out a series of commitments to sustainability in meat production, trade and consumption. Among other things, it calls for measures to avoid the degradation, deforestation and conversion of natural ecosystems in the meat chain, including animal feed products, which are **largely based on soybeans**.

The agreement is likely to have a major influence on changes in meat and soybean production in Brazil, given that **China is the world's biggest consumer** of both products.

An agreement to eliminate deforestation in the soybean supply chain in the Brazilian Cerrado is being discussed by the **Cerrado Working Group**, formed as an offshoot of the Soybean Working Group. This agreement will be the culmination of two years of work, and it represents significant progress in **ensuring that Brazilian soybean production in the biome does not cause native vegetation to be converted**. The group is now completely engaged in dialogue with other players in the global soybean chain, wit h the aim of finding solutions that involve the equitable sharing of responsibilities throughout the supply chain.



China and the European Union together account for more than half of the soybeans exported by Brazil[52]. The engagement of traders, which link Brazilian farmers to purchasers in these markets, is crucial to discourage deforestation caused by soybean production and cattle ranching in the Cerrado.

52 WWF. A saga do grão.

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INTENSIFICATION:
GOOD FOR FARMERS, THE CERRADO AND THE CLIMATE

In the Brazilian Amazon, the results of the New Field Programme demonstrate that the large-scale adoption of sustainable production models could **eliminate deforestation in the cattle raising sector** – the main cause of conversion in the Cerrado and Brazil's greenhouse gas emissions, which are responsible for global warming. Five participating ranches in Alta Floresta, Mato Grosso, achieved an 85% increase in meat output per hectare and 60% reduction in greenhouse gas emissions, while their profits per hectare **went up nearly sevenfold**, from R$100 to R$680, thanks to a remodeling of just 10% of their pastureland in the pilot phase.

The project gave landowners technical assistance to help them adopt agricultural **best practices to intensify their land use**. It is estimated that the rehabilitation of all pastureland would lead to a fivefold increase in production and 90% drop in emissions[53].

If applied on a large scale, these productivity gains would be sufficient **to meet growing demand for animal protein while freeing up areas for more crop production in the coming decades**[54].

To meet increased meat demand by 2030, given productivity trends in the existing system, it will be necessary to increase the total herd by 15%, or 30 million cattle[55]. In the intensified system, cattle gain more weight and are ready for slaughter sooner, due to high-quality pasture and supplements. Thus, with **the same size herd, it is possible to increase meat production**, reducing the pressure to clear more natural areas.

53 ICV, Programa Novo Campo – praticando a pecuária sustentável na Amazônia. Pecuária sem desmatamento na Amazônia matogrossense, 2017. Available at: https://www.icv.org.br/wp-content/uploads/2017/03/Programa-Novo-Campo_resultados.pdf

54, 55 Imaflora, BOAS Práticas de Produção de Gado Reduzem as emissões de GEE e aumentam a produção de carne na Amazônia, 2017

THE PATH TO ZERO CONVERSION IN THE CERRADO

WWF-Brazil, together with a network of multisector partners, is working to achieve **zero conversion** of natural ecosystems in the Cerrado by 2030. The first step is to exclude deforestation from beef and soybean supply chains – the main drivers of deforestation in the biome – by 2020. Some initiatives to conserve the Cerrado and ensure that sustainability of cattle raising are described below:

MARKET COMMITMENT

Create a **market commitment to zero conversion in the Cerrado** would give the biome measures that have already proven effective at reducing deforestation in the Amazon. Commodity value chains play a key role in the development and implementation of voluntary commitments to exclude deforestation from them. Major buyers in Brazil and abroad are involved in a proposal for a comprehensive sector agreement **to block the sale and funding of soy produced by clearing the Cerrado's natural vegetation**.

In addition to broader sector agreements for deforestation-free soybean and beef exports, it is necessary to establish **individual agreements with large retailers** that operate in the domestic market, which consumes 80% of the meat produced in Brazil. **WWF-Brazil is working to engage leading meat processing companies and retailers** to implement a commitment together with their meat packing suppliers to promote production chains that do not convert natural habitats.

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FINANCIAL MECHANISMS

Compensatory financial mechanisms are fundamental to encourage farmers to conserve native areas and stop clearing them. The Forest Code **only requires 20% to 35% of the Cerrado to be maintained as minimum areas of native habitat** on rural properties, and in most cases, the conversion of up to 80% of natural vegetation on private properties is permitted. Incentives for conservation must be created so that farmers stop clearing these areas, as permitted by law. Public mechanisms, such as **payments for environmental services**, are already provided for in the Forest Code. Landowners also need support to invest in pastureland rehabilitation, technology to boost the productivity of cattle raising, and reforestation.

RAISE PUBLIC AWARENESS

Raise public awareness to encourage purchases of products that do not contribute to deforestation. An opinion poll commissioned by WWF-Brazil showed that Brazilians are concerned about deforestation and they consider it to be one of the country's biggest environmental problems[56]. Initiatives that publicise commitments to conserve the Cerrado could **channel society's association in support of changes** and new consumer attitudes to influence politicians' and companies' decisions.

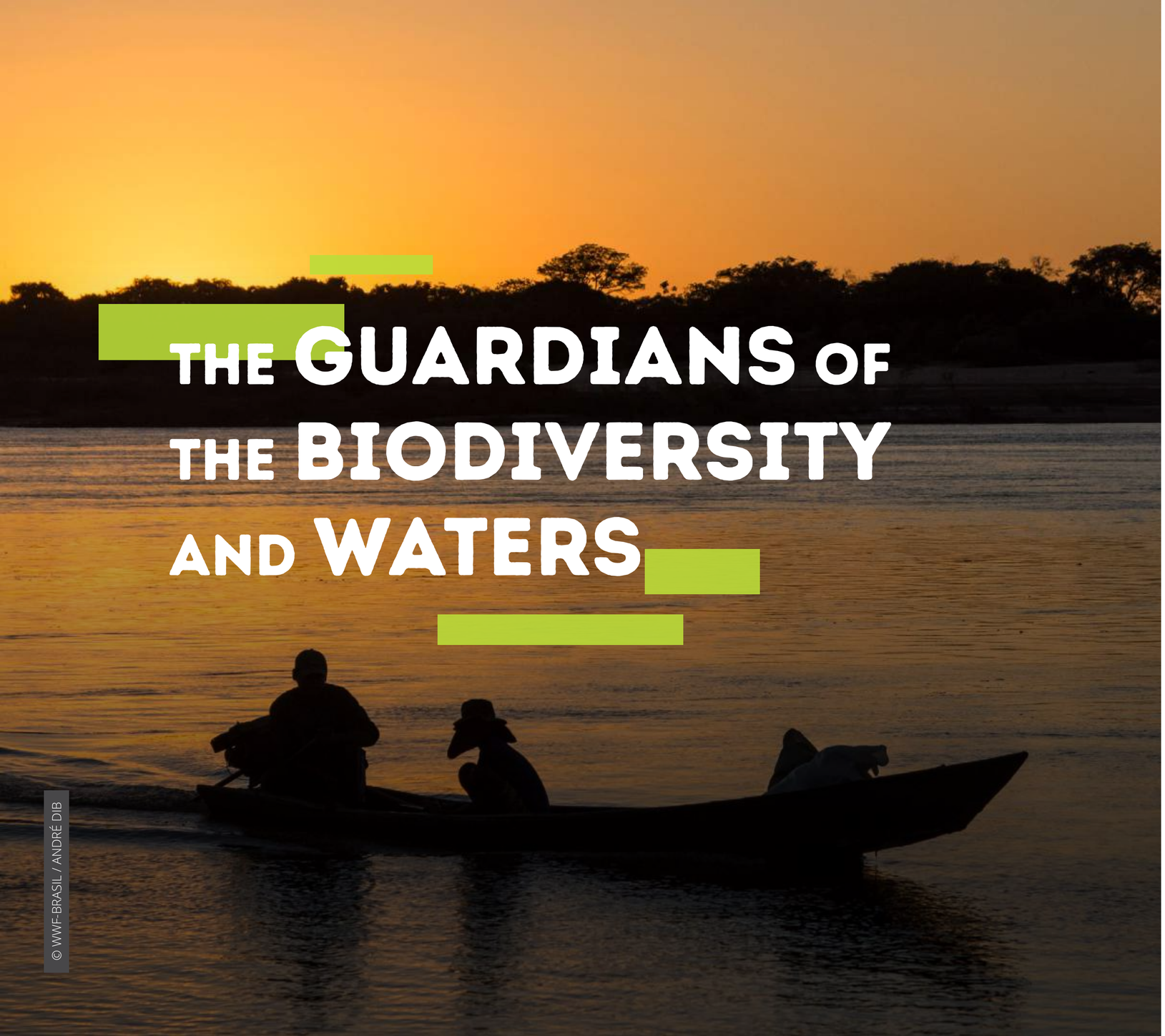
EXPAND PROTECTED AREAS

Expand the network of public and private protected areas is the most effective way to guarantee that habitats of great value to biodiversity, water supply and climate regulation are not cleared. **Just 3.5% of the Cerrado is fully protected** through Conservation Units. WWF-Brazil is working to ensure that 17% of the biome is protected by 2030.

PROMOTE THE SUSTAINABLE USE OF VEGETATION

Promote **economic models that harness the sustainable use of native vegetation.** Alternative income models could use agroforestry and the accumulated knowledge and ways of life of the Cerrado's traditional peoples, who generally **promote the biome's conservation and value its biodiversity**. These peoples have built up specialised knowledge of local vegetation, the climate and the rhythms of nature, allowing them to interact harmoniously with the biome.

56 https://www.wwf.org.br/?67242/Pesquisa-WWF-Brasil-e-Ibope-Brasileiro-quer-ficar-mais-perto-da-natureza-mas-acha-que-ela-no-est-sendo-protegida



THE GUARDIANS OF THE BIODIVERSITY AND WATERS

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Man's interaction with the most biodiverse savannah in the world has led to a unique **socio-ecological system that is capable of conserving the Cerrado**. Thousands of traditional and indigenous communities live in the Cerrado and use its resources in order to survive and to maintain their ways of life. The destruction of this unique biome threatens 5% of the planet's species and puts the existence of these peoples at risk.

A hugely diverse range of **people and traditional communities have lived in the region for over 12,000 years**. More than 80 original peoples can be found there, including the Xavante, the Kraô-Kanela, the Tapuia, the Guarani Kaiowá, the Terena, the Xakriabá, the Apinajé and the Araguaia, as well as traditional quilombo communities, babassu coconut breakers, the geraizeiros – the traditional people of the state of Minas Gerais, small farmers, and backcountry and riverine communities[57].

57 Campanha Nacional em Defesa do Cerrado - http://semcerrado.org.br/

The traditional people of the Cerrado have accumulated knowledge and ways of life that promote the conservation of the biome and value its biodiversity. For this reason, they are known as the guardians of the biodiversity and waters of the Cerrado.

"The biological diversity and different environments found in the Cerrado is impressive, but the diversity of people is also incredible. These people have developed specialised knowledge on the vegetation, climate and the rhythms of nature, which is an undervalued part of our country's heritage," explains Isabel Figueiredo from the Institute for Society, Population and Nature (ISPN).

QUILOMBOLAS

Are the members of **rural black communities** created by the descendants of enslaved Africans. Most of these live off subsistence farming.


© WWF-BRASIL / ANA PAULA RABELO

GERAIZEROS

Are the traditional people from a region called Gerais in the north of Minas Gerais state. **They live on the plains, hillsides and valleys** of the Cerrado on the banks of the São Francisco River.


© WWF-BRASIL / MARCUS DESIMONI


© WWF-BRASIL / EDUARDO AIGNER

BABASSU COCONUT BREAKERS

Are the women who make a living through the extractivism of the babassu coconut. They have created **one of the largest social movements in Brazil**, which unites over 300,000 women who fight to maintain **their right to continue their tradition of using the babassu palms of the Cerrado**, the Caatinga and the Amazon.


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TRADITIONAL PEOPLE AND COMMUNITIES

Traditional people and communities are culturally different groups that recognise themselves as such, who **have their own forms of social organisation** and need to occupy the land and use natural resources in order **to maintain their cultural, social, religious, ancestral and economic way of life** using knowledge, innovation and practices that are passed down over the generations (Decree no. 6,040/2007)[58].


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58 http://www.mma.gov.br/perguntasfrequentes.html?catid=16

AN ENORMOUS POTENTIAL TO BE HARNESSED

The potential of the extractivism of biodiversity as a strategy for the conservation of the Cerrado is enormous. Over **50 typical fruit species of the Cerrado**[59] **are used by the communities** who live in the biome, many of which are already marketed and researched for their **high nutritional and therapeutic value**[60], including the pequi, the buriti, the courbaril and the mountain soursop. There are a further 220 plant species that have medicinal propertiesl[61].

59 http://www.centraldoCerrado.org.br/conheca-os-frutos-do-Cerrado-e-suas-sazonalidades.html/

60 https://www.unicamp.br/unicamp/sites/default/files/jornal/paginas/ju_637_paginacor_11_web.pdf; https://www.unbciencia.unb.br/biologicas/104-ciencias-biologicas/355-pequi-tem-propriedades-medicinais; http://faesfpi.com.br/revista/index.php/faesf/article/view/24; ttps://repositorio.unesp.br/handle/11449/121857

61 http://www.mma.gov.br/biomas/Cerrado

A MOSAIC OF OPPORTUNITIES

The **Sertão Veredas Peruaçu Mosaic** is a key area for the conservation of the Cerrado and its social and cultural heritage. Located between the states of **Minas Gerais, Bahia and Goiás, it includes 31 protected areas in 27 municipalities**. Its impressive landscape contains beautiful waterfalls, enormous caverns and immense buriti palm groves that make up the important tributaries of the São Francisco River. The mosaic contains **four quilombo communities, two areas of indigenous land belonging to the Xakriabá people, some urban centres and large commodity plantations**.

With the land being used in many different ways, the mosaic represents on a regional scale the opportunity to promote **development based on the protection of natural habitats**, in contrast to the model that favours the conversion of native vegetation for agricultural production. In 2018, the area of the mosaic almost doubled with the inclusion of other protected areas in the region. This made it one of the largest mosaics in the Cerrado with a total area of 3.5 million hectares.


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WWF-Brazil has been working in the mosaic since 2010 on integrated landscape management actions. These encourage the adoption of best practice by agriculture and the implementation of integrated management by protected areas and their advisory or deliberative boards, including support for the expansion of the mosaic and the innovative initiative to strengthen the production chain for the fruits of the Cerrado. **Positive results in the management of the mosaic** and the involvement of traditional communities demonstrate that **this model can be replicated in other areas of the biome**, increasing the scale of conservation and the sustainable use of the Cerrado.

> “This is fertile ground for **territorial conservation actions**, which at the same time involve **development based on sustainability**, actions with communities and the reduction of the impacts of unsustainable agricultural production by large producers. A range of realities can fit into the idea of **integrating territorial management to support conservation** and help the territory **to develop sustainably**. This is necessary in this highly endangered environment due to conversion and the consequent negative impacts of this for traditional and indigenous communities living in the region.”

Kolbe Soares

Conservation Analyst at WWF-Brazil

WHAT IS A MOSAIC?

A mosaic is defined by the National System of Protected Areas (Law 9,985/00) as a set of protected areas that may or not have different categories, and that are close, juxtaposed or overlapping, and other **public or private protected areas**, making up a mosaic. The management of these must be integrated and participative and consider the areas different conservation needs in order to ensure the compatibility of the presence of **biodiversity**, the valorisation of **social diversity** and the **sustainable development** of the region.

TERRITORY UNDER PRESSURE

Controlling the conversion of native vegetation is one of the biggest challenges in this region. **In seven years, this natural area has shrunk from 75% to 63%**, being substituted with large-scale soybean and eucalyptus plantations and pastureland. **Traditional peoples and communities have already suffered from water shortages** during the dry season and studies have indicated that the region's veredas, or swampy plains, and rivers could dry up within 20 years. This serious alert is not just relevant at a regional level, but for the São Francisco River Basin, which supplies water for seven of Brazil's states.

> The veredas **died as a result of conversion**. This has stolen all of the water from our veredas, our lagoons that had never dried up before. **Before the eucalyptus everything was perfect**, it was full of fish and birds here. It was beautiful.

José Gomes Lira (Nego)

Extractivist farmer from the community of Barra do Mandins

> **The pequi hasn't grown for two years, and they didn't manage to harvest the manioc this year.** The other day I went to wash some clothes in the river and I was shocked by the **low level of the water**. Before, the water came up to your chest. Now it doesn't even come up to your waist.

Dona Valdenísia

Extractivist farmer from the mosaic

Forest fires destroyed over 600 hectares in the Cavernas do Peruaçu Protected Area, leaving the veredas in ashes

INSECURE ACCESS TO LAND

The conversion of the Cerrado is threatening the survival of communities that rely on the conservation of large areas. Many of these **live collectively on the land**, and without owning the titles to their properties they **are put under pressure to leave their homes by the advancing agribusiness**. It is estimated that there are **one thousand traditional communities** living in the mosaic, many of which without their land officially recognised and living in conflict over their right to the land with large corporations.

VALUING THE CERRADO THAT IS STILL STANDING

The extractivism of socio-biodiversity products is one of the main alternatives available to conserve the Cerrado. Experience with the Sertão Veredas Peruaçu Mosaic demonstrates that **through actions to support the organisation of the production chain and access to the market, it is possible to increase the income of extractivist communities** through sustainably used products, generating **an inclusive regional economy based on conservation**.

In four years, the quantity of marketed agro-ecological products from the three cooperatives working in the region has more than doubled. During this period, around 230 tons were produced, generating almost 3 million reals in sales and benefitting the 250 families that are directly involved and 2,200 extractivist families living inside the mosaic.

Extractivism was boosted in 2014 through initiatives to strengthen the production chain led by WWF-Brazil and its partner organisations. These actions included dozens of training sessions attended by members of **extractivist cooperatives, community associations and quilombo and indigenous communities**, as well as investment into infrastructure, machinery and technical assistance. The associations, partnerships and opening markets bring these traditional people the hope that they will be able to live off the fruits of the Cerrado on the same land as always and in the same way that they learned from their ancestors.

In 4 years, approximately 250 tons of sustainable products from the biodiversity of the Cerrado generated almost 3 million reals for extractivist communities in the mosaic.

Year	Production	Revenues (R$)
2015	42 tons	450,000
2016	57 tons	500 mi
2017	72 tons	800 mil
2018	80 tons	1 milhão

FEMALE STRENGTH
IN EXTRACTIVISM

The first shipments of Pequi cream to Japan reflect the strength of the region's female extractivist farmers. They are responsible for the harvest and processing of this product through Cooperuaçu, a cooperative created in 2016 with the support of WWF-Brazil. The 68 association members live in the 11 communities in Peruaçu, one of the three main centres in the mosaic. This growth in production and the opening up of this market is **encouraging young people who left their families and way of life behind to move to the big city** to come back home.

> **We are part of the Cooperuaçu cooperative. It is made up 70% of women**. They got their hands dirty, encouraged our young people to stop moving out of our region and stay here with us.

Eva Santos

The Cooperuaçu treasurer

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A LINK BETWEEN COMMUNITIES AND THE MARKET

The **Cerrado Central acts as a business hub** for 40 community-based organisations, extractivist associations and cooperatives in the Cerrado and the Caatinga. In 2018, it made revenues of around R$ 12 million reals through the sale of extractivist produce. All resources are obtained and **passed on directly to its associated organisations**, benefitting more than 5,000 families. To ensure that the fruits of the Cerrado reach the market, the Central seeks out secure commercial partners so that harvests can be planned and production increased.

WWF-Brazil has supported the Cerrado Central since 2018 in the dissemination of information, the exchange of knowledge and provision of technical support for communities to improve their productive, organisational and management processes. The actions developed as part of this partnership are strategic in the **strengthening of the mosaic's production chain** so that buyers can be found for socio-biodiversity produce and this activity can be scaled up, generating income for more families.

> If we look at the locations of these communities in satellite images, this is where the Cerrado is being conserved. The **presence of humans making sustainable use of native biodiversity is the driving force behind conservation.**

Luís Roberto Carrazza

Coordinator of the Cerrado Central

BARU,
FROM OBSCURITY TO GOURMET PRODUCT

Until the 1990s, the baru nut could not be found on the market and was not even consumed locally where it grows. Today it is one of the main extractivism products from the Cerrado, **is considered to be a super food and a delicacy, and is just as profitable as the Brazil nut.**

Accompanying the Xavante Indians on one of their long hunts in the state of Mato Grosso, the researcher Wanderlei de Castro discovered and realised the potential of the baru nut, which the Indians enjoyed as **a light and nutritious snack**. The creation of **social technology to extract** the nut from its extremely hard shell led to it being harvested by various communities.

In Pirenópolis, a touristic city in Goiás, the baru nut was **introduced at gastronomy festivals** where it won over Brazilian and international chefs who then went on to raise the profile of different dishes including the nut. More recently, it was included on the list of products included in the **Slow Food movement** as a species of gastronomic excellence endangered by conversion. The baru nut is currently collected across the whole Cerrado and is one of the Cerrado Central's emblematic products, with an **annual production of 15 tons**.

> Biodiversity exists because there are communities and people who are there dealing with these resources, who know how to extract them from nature and **leaving it richer** instead of poorer.
>
> **Marcelo de Podestà**
> *Slow Food* Brazil

CREATING ACCESS FOR 20,000 FAMILIES

There are **thousands of traditional people and communities** in areas that are important for the conservation of the biome, and providing these with access to markets can increase their incomes and guarantee that they can **stay on their land and maintain their roles as guardians of the Cerrado**. WWF-Brazil hopes that at least 20,000 families will participate and be benefitted by the strengthening and structuring of the production chain for socio-biodiversity products of the Cerrado, allowing them **to use the fruits and native produce of the Cerrado sustainably** and secure an income through access to markets. In order to do this, their work needs to be expanded and obstacles need to be overcome. Find out more below:

THE REPLICATION OF EXPERIENCE IN OTHER REGIONS

The replication of experience in other regions represents a **unique opportunity to widen the use of non-timber forest products** by traditional people and communities in other priority areas for the conservation of the biome. Experience in the Grande Sertão Veredas Mosaic has proven that the **sustainable extractivism of the fruits of the Cerrado can provide significant gains in income generation**, providing a higher quality of life for families living on their traditional land. There is a lot of potential for growth in the sale of fruits, seeds, nuts, fibres and other natural assets from the Cerrado that are obtained from the mosaic, and spreading this knowledge to other regions **means scaling up a model that values the existing Cerrado** while maintaining its social and cultural heritage.

PROMOTION OF PUBLIC POLICY AND FINANCIAL MECHANISMS

Promotion of **public policy and financial mechanisms for the sustainable use of biodiversity** is crucial. Public investments in promotion and infrastructure that were already limited to extractivism have been drastically reduced in recent years and need to be expanded. One example is the impact of the **Food Acquisition Program on the Grande Sertão Cooperative**, whose production of fruit pulp increased six times in four years due to purchasing regulations. This and other programs have undergone severe cuts.

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WORKING AS A PART OF A NETWORK

Working as part of a network **widens scope and enables complementary actions** to be carried out based on the expertise of each organisation. In the Sertão Veredas Peruaçu Mosaic, partnerships with institutions such as **the Brazilian Micro and Small Enterprises' Support Service** (Sebrae) to provide technical support, and the **Cerrado Central** to open up markets and increase sales, were strategic in achieving the results obtained. Dozens of other organisations and public bodies have contributed to this.

THE STRUCTURING OF PRODUCTION CHAINS

The structuring of production chains for socio-biodiversity involves **training activities** so that extractivist farmers are able to organise themselves better for production and sales activities, and also helps by **providing infrastructure and machinery** for small units so that they can process fruits to a high enough **quality and quantity for sale.** Experience in the mosaic has proven that the value invested in training and infrastructure at these stages leads to high returns in terms of gains in production.

MOBILIZATION OF THE MARKET

Mobilization of the market for **environmentally responsible and socially fair commerce** together with cooperatives paves the way for partnerships. Companies still do not understand the complexity of extractivist farming systems and how they work in **the opposite way to monocultures.** These products are subject to seasonality and are harvested in vast native areas that are far from the large urban centres and have substandard transport networks, and often lack structure for processing. By supporting the structuring of these chains, **the market has a fundamental role in informing consumers** about products' origins, their role in the conservation of the Cerrado and traditional cultures, and their high nutritional value and absence of pesticides.