

Caio Penido

Cocalinho,
Mato Grosso, Brazil

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We recognize that innovation and constant improvement is vital to our success. We are constantly striving to discover and adopt new practices and technologies that can help us improve the sustainability of our business.

Caio Penido, Owner of
Água Viva & Lago Azul



Introduction to Brazilian production

With a population of 209 million people¹ and covering an area of approximately 8.36 million square kilometers, Brazil is the largest country in South America and the fifth largest country in the world.

Brazil is officially divided into five regions: North, Northeast, Center-West, Southeast and South, and shares borders with every South American country except Chile and Ecuador.

By 2016, Brazil's agricultural land area had expanded to 2.84 million sq. km making it one of the world's largest producers of soybeans and sugarcane. Almost 63% of Brazil's agricultural production value¹ comes from soybeans, sugarcane and corn (maize). In 2018, Brazil achieved its highest level of beef production at 9.9 million metric tons and was responsible for almost 20% of global beef exports, making it the largest global exporter.

About 60 percent of Brazil's cattle herd is concentrated in the Center West and North regions, mostly in the state of Mato Grosso, Mato Grosso do Sul and Para. Beef production is mostly pasture/grass fed, with feedlots accounting for an estimated 10% of production volume. Due to the climatic conditions in Brazil around 80% of cattle breeds are Zebu-type (*Bos Indicus*), and includes breeds such as the Nelore, Gyr, and Guzarat.



5th

largest country in the world

232m

cattle — 2nd largest global cattle herd¹

4th

largest supplier of beef to McDonald's

¹Data from 2018

Mato Grosso — Brazil

The state of Mato Grosso is Brazil's agricultural powerhouse, being the largest producer of beef and soy in Brazil. With a cattle herd of 30.2 million cattle¹ and growing an estimated 26 million tons of soy, it makes up one third of Brazil's total crop and 8% of global production.²

Mato Grosso is comprised of three biomes, the Amazon, the Cerrado and the Pantanal. Unfortunately, it had the highest historical rate of deforestation of any of the Brazilian Amazon states, around 7,800km² of forest was cleared in the Amazon Biome every year between 1996 to 2005. The current situation in Mato Grosso has drastically improved with deforestation reduced by 86%. Both soy and beef production volumes are continuing to increase, which is being driven by the adoption of efficient production practices, rather than expansion of production areas. The state is actively developing solutions to help address climate change and reduce their carbon emissions.



Key facts about Mato Grosso

- Largest producer of beef and soy in Brazil
- 30.2 million cattle¹
- Approximately the size of France and Germany combined

¹Data from 2017

²Data from 2013/2014

Introduction to Agua Viva & Lago Azul

Caio's grandfather started purchasing land in the Cocalinho area of Mato Grosso in 1999 with the acquisition of Agua Viva. This was followed by the purchase of Lago Azul in 2011. The total combined area of the two farms is 5,070 hectares (12,523 acres), with 62% of the land in agricultural production and the remaining 38% retained as a protected reserve.

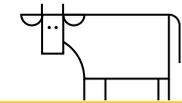
By 2018, both Agua Viva & Lago Azul were inherited by Caio Penido. Caio now runs and manages the two farms rearing and fattening beef cattle. The farm purchases Angus X Nelore heifers at 6 months of age, weighing around 200kg (440lbs.). The heifers are sourced and purchased from farms certified under the 'Produzindo Certo' which is an initiative operated by the NGO 'Alianca da Terra'. The scheme verifies that the cattle being purchased have not been sourced from deforested areas.

The heifers are rotationally grazed around the farm until they are 15 months of age, at which point they are synchronised and then artificially inseminated with Brangus semen (Brahman x Angus). The aim is to maintain a 50% Bos Indicus genetic in the calves which is important to ensure cattle are able to thrive in the local environment. The heifers are then calved down at 25 months of age, with their calves weaned at 6 months of age. The cows are then grown on for an additional 2–3 months when they are then sent to slaughter weighing around 550 kilograms.



5,070

hectares of land
(12,523 acres)



800

suckler
cows

Introduction to Agua Viva & Lago Azul

The objective of the system is to maintain growth throughout the whole production phase. By ensuring the heifers are still growing, as well as producing a calf, makes the system very efficient in terms of animal growth and feed utilisation. All the calves born on the farm are then reared through to finish, with males being sent to slaughter at an average of 24 months of age.

All cattle are rotationally grazed across the farm's pastures and if necessary are provided with supplementary feed in covered troughs. Rotational grazing has become an increasingly important part of the farm's pasture management strategy. Creating 30-hectare (74 acre) blocks which provides the cattle with around 7 days of grazing and then allows the plots to be rested for the next 25–28 days before cattle are re-introduced. By avoiding overgrazing and the subsequent reduction in grass recovery has helped improve pasture growth and efficiency.

Optimizing pasture productivity has helped increase animal units per hectare and has already seen a 100% improvement over the last 8 years from a 2011 baseline. These practices are increasing cattle growth rates and improving farm efficiency, helping the farm to produce more beef from the same area of land.

i

100% increase

in animal units per hectare since 2011



The region of Cocalinho is well suited to pasture and livestock production, with summer temperatures averaging 26°C and annual rainfall levels of 1565 mm (61.6 inches) per year.

Sharing and implementing sustainable practices

Caio is focused on developing, sharing and implementing sustainable practices on the farm. In 2014, Caio helped to establish an initiative called, “Liga do Araguaia”.

The aim of the program is to help connect local cattle producers and develop sustainability projects with supply chain companies and NGOs. Caio is an active member of the “Liga do Araguaia”, helping to organise field days, presentations and events aimed at knowledge sharing. There are currently around 63 farms (2018) part of the “Liga do Araguaia”, which are all situated within the Amazon and Cerrado biomes.

Core Values and Goals:

- Providing farm staff and their families with access to local services, such as health and recreation, as well as helping to provide access to education for local children
- Develop the farm and protect the natural habitats it supports to create a viable and sustainable business
- Implement and test practices that improve the sustainability of beef production
- Collaborate with other farmers and stakeholders to share knowledge, create new ideas and concepts to improve beef sustainability
- Communicate the story of beef sustainability in Brazil, from the adoption of new practice, to the work being done to protect the environment



Beef Production & Conserving Nature

Caio is a leading agricultural voice in the effort to protect Brazil's threatened ecosystems, including the Amazon and Cerrado Biomes, both of which are part of the farm.

In addition to the legal reserve he is maintaining on the farm, Caio has begun reforestation efforts in other key areas of his land. Through these efforts, Caio has seen the return of crucial flora and fauna, including the Jaguar. The presence of an apex predator such as jaguars indicate a robust and thriving ecosystem. Agua Viva has been recognized with the Certificado Onça-Pintada, or Jaguar Certification by the Instituto Onça-Pintada for accomplishments related to this threatened species. By exemplifying actions and conduct

that allow for the coexistence of cattle production and the jaguar, Caio and other landowners are taking a leadership role in decisions that will help determine the jaguar's existence for future generations.

As part of the Araguaia League (see page 15), Agua Viva also supports the Produce, Conserve, Include (PCI) Strategy. In 2015, Mato Grosso's government and partners from different sectors created the PCI strategy as a way to increase productivity while maintaining native vegetation cover and reducing deforestation. By 2030, the PCI aims, among other goals, to reduce deforestation of the Amazon and the Cerrado woodland by 90 and 95 percent respectively, regrow natural forests on 6.7 million acres of land, increase the production of soy and cattle and provide technical assistance to all of the state's 104,000 small-scale farmers.



Agua Viva & Lago Azul Sustainability Objectives

Environment

- Implementing environmental initiatives to improve biodiversity by protecting and enhancing the farm's natural habitats, which in turn supports the return of native flora and fauna — demonstrated by frequent sightings of a jaguars
- Protecting the natural habitats and managing the farm sustainably provides valuable ecosystem services, such as storing and sequestering carbon and improving the health of soils
- The construction of large drinking troughs for cattle ensures livestock do not need to access local waterways to drink, avoiding the potential pollution risk and damage to riparian areas

Ethics

- Administer a critical service to the local community by providing resources for education and schooling for children and a health care clinic
- Collaborate and engage with other beef producers as well as industry stakeholders to create sustainability initiatives which help identify and develop new practices as well as improve their uptake and adoption
- The provision of good employment and labour conditions for staff on farm, such as training, pay and staff housing
- Help inform and improve public perception by communicating the positive sustainability work being undertaken within the beef sector
- Incorporating low stress handling systems and methods helps to protect the health and welfare of the animals and the staff working with them

Economics

- Selecting genetics to maintain a 50% Bos Indicus split ensures animals are fit for the local environment and incorporates hybrid vigor to improve growth rates and productivity
- With the area's rich local history and unique habitats, the business is diversifying to generate additional income through tourism
- Manage pasture/grazing to optimize productivity via rotational grazing

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I feel how we manage the farm surpasses the expectations of consumers in relation to animal care, labour conditions, and respect to the environment. We take our responsibilities seriously and are active participants in our local community.

Caio Penido, Owner
of Agua Viva & Lago Azul

Image: Leo Lima and Caio Penido (right) on the farm



Pasture Management

Improving pasture management to increase grass growth and feed utilisation by cattle is a critical factor for any grass-based beef system. The farm's rotational grazing policy is formed around 30-hectare grazing plots, which provide cattle with six to seven days of grazing. The plots are rested for 25–28 days before cattle are re-introduced. The grazing/rest frequency is adapted dependent on factors such as grass availability and the nutritional needs of the cattle.

Rotational grazing is designed to maximize the specific growth traits of grass. Undertaking short duration grazing spells provides more time for the grass to recover and regrow between grazing episodes. This can drastically increase grass growth by over 30% versus continuous grazing.

The farm also considers weed control as an important factor in pasture management. Again, rotational grazing plays an important part in this process as it provides the opportunity for beneficial grasses to rest, and then grow, out-competing weeds. Soil pH management is also critical, and the use of dolomite lime is used to maintain a pH level of 5.0–6.5. Targeted fertiliser applications are used to ensure soil nutrients are balanced for optimum grass growth.



Key Outcomes & Actions

- Baseline measurements started in 2011 recorded 0.49 animal units per hectare. In 2018 this had risen to 1.01 animal units per hectare, with the aim of achieving 1.34 animal units per hectare by 2024
- Animal units per hectare has doubled in the last 7 years
- Rotational grazing helps to break parasite lifecycles by moving cattle regularly
- Carbon sequestration and carbon storage capacity of pastures is improved

Water Provision & Protection

The amount of water cattle drink is closely related to their feed intake. Therefore, it is critical to provide clean, palatable drinking water to ensure livestock are healthy and productive. There has been a large investment in cattle drinking facilities across the farm to ensure stock have easy access to clean drinking water.

A bore hole was drilled on farm, and the water is pumped to a large header tank which feeds water into several 8,000 litre, circular concrete troughs around the farm. The 8,000 litre capacity troughs provide enough volume of water to meet all the demands of the cattle to drink at once and has the capability of providing enough water for 2–3 days in case of a water system failure.

The provision of water troughs also means cattle do not need to access natural water sources, avoiding any subsequent contamination of waterways, and damage to riparian areas. Providing a troughed water system throughout the pastures is also a critical component of a successful rotational grazing system.



Key Outcomes & Actions

- Easy access to good quality water helps improve cattle health and productivity
- Providing water troughs means natural watercourses and riparian areas are protected from damage caused by cattle searching for water
- Invaluable element to the success of a rotational grazing system



Ecosystem Protection

Regulations in the state of Mato Grosso require landowners to maintain a minimum of 25% of their total farm area as reserves for native vegetation. Caio has exceeded this requirement, having 38% or 1,720 hectares (4,248 acres) of the farm's land in reserves. These areas provide valuable habitats and are extremely rich in biodiversity.

The farm is also working in partnership with The Nature Conservancy which have helped develop a forest recovery plan. This has helped identify and preserve approximately 26 hectares (64 acres) of forest, which is part of the new forest code.

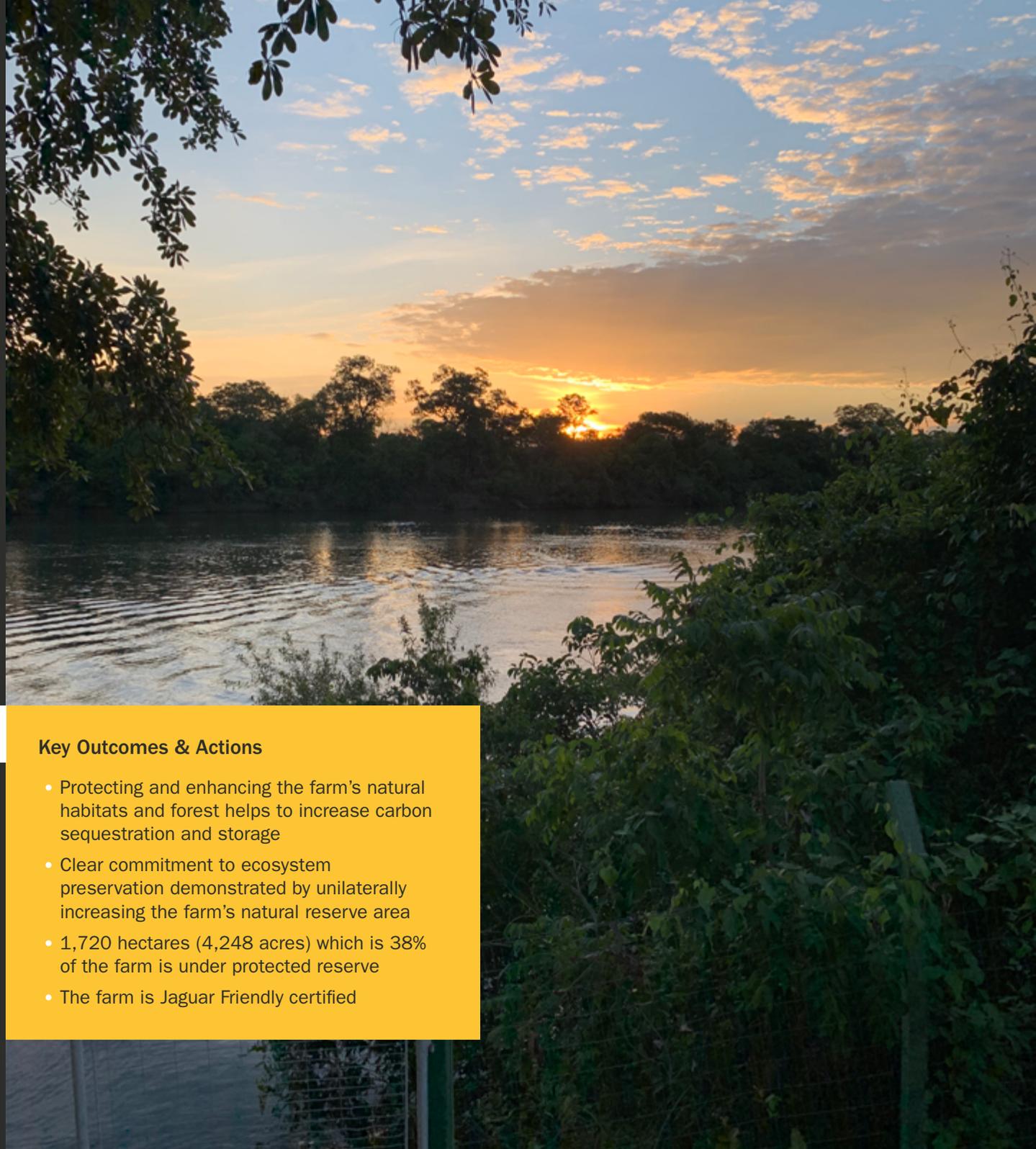
Forest, natural habitats and soils are among the planet's largest reservoirs of carbon. Protecting and enhancing these areas all have a significant impact on the farm's ability to increase its carbon sequestration and carbon holding capacity.

The farm is also recognized for the conservation of its fauna through the Onça-Pintada Certificate, which is aimed at rural producers, enterprises or service providers that are established in known jaguar ranges, whose sustainable practices contribute to the conservation of this threatened species.



Key Outcomes & Actions

- Protecting and enhancing the farm's natural habitats and forest helps to increase carbon sequestration and storage
- Clear commitment to ecosystem preservation demonstrated by unilaterally increasing the farm's natural reserve area
- 1,720 hectares (4,248 acres) which is 38% of the farm is under protected reserve
- The farm is Jaguar Friendly certified



Ecosystem Services

Caio has allocated 500 hectares (1,235 acres) of Agua Viva in conjunction with 24 other farms to the 'Carbono Araguaia Project'. This project has a combined total area of 82,000 hectares (202,540 acres) and was designed to make the 2016 Brazilian Olympic Games carbon-neutral by 2020 through carbon sequestration and sustainable farming practices introduced on the land and the farms involved.

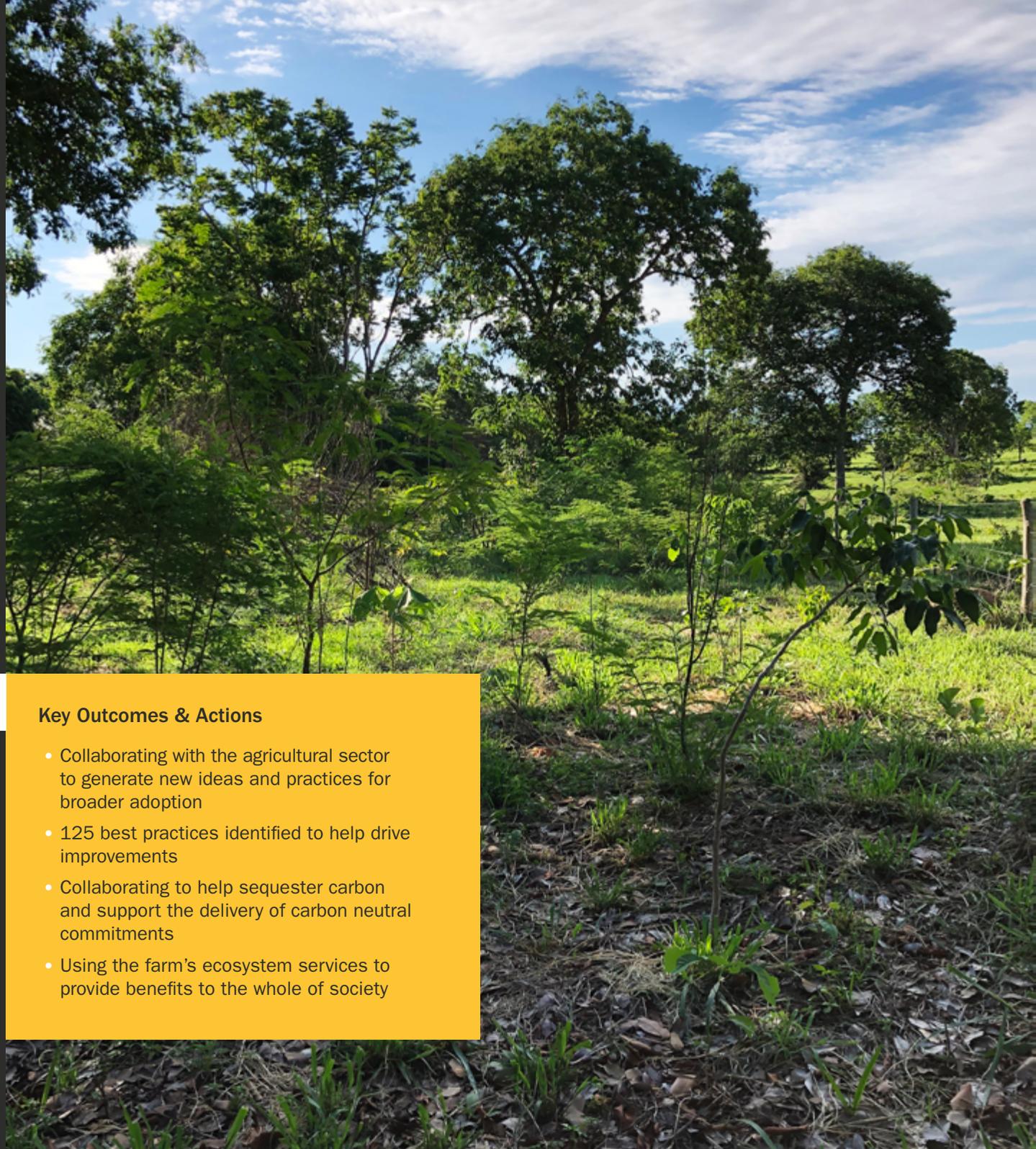
Caio has also included a further 500 hectares (1,235 acres) of land in an intensification project with another 50 farms that have allocated a combined area of 130,000 hectares (321,100 acres) to the project. The objective of this project was to identify sustainability practices that could be shared with farming peers. Currently, over 125 best practices have been identified and are available for broader uptake and adoption.

From this project the farm has adopted an annual rotation growing soybeans during summer, which is followed by a grass crop which is used by the cattle for grazing, helping to increase land productivity and efficiency.



Key Outcomes & Actions

- Collaborating with the agricultural sector to generate new ideas and practices for broader adoption
- 125 best practices identified to help drive improvements
- Collaborating to help sequester carbon and support the delivery of carbon neutral commitments
- Using the farm's ecosystem services to provide benefits to the whole of society



Third Party Verification

The farm is audited by their beef purchaser JBS, using a socio-environmental monitoring tool. The results of these audits are used to verify the public commitments made by JBS ensuring they do not purchase cattle directly from farms in protected or deforested areas.

The farm is also working with an initiative called “Araguaia Guarantee Protocol”, which is applied together with the Brazilian Roundtable for Sustainable Livestock’s “Indicator Guide”. The project, developed in partnership with Imaflora — (Institute of Forestry and Agricultural Management and Certification), aims to create a management tool which assists sustainable livestock production and ensures it is an important contributor to supporting on farm biodiversity and conservation.

The farm is Rain Forest Alliance Certified, which guarantees the adoption of good sustainable practices. This third-party verification was an important part in the process of learning and improving the sustainable production system, becoming a recognition of the quality of what we produce.



Key Outcomes & Actions

- With the focus on deforestation and loss of biodiversity in Brazil, it is essential to have independent third party verification to ensure credibility and support customer confidence
- The farm is audited and approved under the Rainforest Alliance certification program



Partnerships & Collaboration

Caio works collaboratively with local farmers, NGOs, and the Brazilian Roundtable on Sustainable Livestock to help progress beef sustainability. His work with the initiative “Liga do Araguaia” is important in helping to communicate new ideas as well as collaborating on initiatives to support sustainable livestock projects within the Vale do Araguaia region of Mato Grosso.

Caio is an active partner with “Liga do Araguaia”, which is a group of 63 farms dedicated to promoting sustainable production. This group represents approximately 90,000 cattle and 150,000 hectares — with 64,000

hectares dedicated to preservation. The aim of the group is to share the results and learnings of practices with all the members of the “Liga do Araguaia”, recent and current projects have focused on:

- Scaling sustainable productivity through livestock integration, management and pasture intensification
- Supporting production models that reduce greenhouse gas (GHG) emissions from cattle farming through the Araguaia Low Carbon Beef project in partnership
- Engaging smallholders and rural workers through ecological tourism and community development initiatives

The farm plays an incredibly important role in demonstrating these best practices. Helping other farmers to understand how they have been incorporated into the day to day management of the farm. The key to success and change is ultimately based upon the wider adoption of these practices and multiplying that positive benefit.



Creating a Community

Caio's grandparents, Pelerson and Lucia were married in 1949. Their work and business interests, which included building roads, railroads and ports meant they lived and travelled extensively throughout Brazil.

Pelerson and Lucia both had a strong sense of community and were active participants in the lives of their employees and communities where they lived and worked. When they moved to a new area the couple always helped the local community build a chapel and a school. They valued education, always encouraging those who crossed their paths to study and improve themselves. They believed that by providing people with the right opportunities they would be able to pursue their dreams.

Inspired by this legacy and to continue this work, in 2011 the Penido family created, 'The Fundação Lucia e Pelerson Penido (FLUPP). This foundation aims to support local people and communities and to help contribute to a better Brazil.

With this in mind Caio appreciates the importance of creating a sense of community for the farm staff, their families and local people. By providing good facilities and accommodation to the farm's 12 full-time employees and their families is incredibly important. They also have access to a health clinic, a small market, cafeteria, and sports facilities, which plays an important part in people's social lives. The health clinic has a nurse and a doctor, providing first aid and any required vaccinations (in-line with regional or national health campaigns). These facilities are also available to the whole of the local community.



Image: Lucia and Pelerson Penido

Creating a Community (continued)

In agreement with the local Mayor, a municipal and state school is operated on the site and provides all local children with the opportunity to access education, which is vital within these rural and sometimes isolated communities. A bus service is also provided to transport children to and from school, with some children travelling up to two hours just to get to school.

As the farm is situated many miles from the nearest city or town, creating a hub or a heart for the community has been critical, this has encouraged the staff and their families to stay and work on the farm rather than moving to more urbanized areas.

By providing all the essential elements to build a successful community; good facilities, good employment, good health care and good education is helping to continue the legacy started by Caio's grandparents and it's a legacy that should be continued.



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We will continue to invest in the farm, in our employees and in sustainable regional development. We believe that by generating income and creating jobs through sustainable farming we can protect our business, our community and the environment now and into the future.

Caio Penido, Owner
of Agua Viva & Lago Azul

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