

# Aperam BioEnergia

## Maintaining biodiversity in a monoculture



*To fuel our Brazilian blast furnaces and produce pig iron, Aperam locally generates its own charcoal from BioEnergia's FSC®-certified forests and their 80,000 ha of cultivated eucalyptus. This helps us entirely eradicate the use of extractive coke, which contributes not only to Global Warming, but also the loss in biodiversity caused by climate change.*

*However, because BioEnergia's forestry is a monoculture (i.e., it grows a single type of plant - the eucalyptus tree on specific parcels), we need to address the general public's concerns on the possible negative impacts that are traditionally linked with single-crop forestry.*

*Read on to learn how our teams are doing exactly that!*

## Are all monocultures bad for biodiversity? How different is BioEnergia from other monocultures?

### 1- Impact on deforestation

Although a valid concern from environmental organizations, **BioEnergia's forestry has been planted for decades and in no way contributes to deforestation.** It is also not part of the Amazon rainforest. In fact, the land that is now the forest used to be a large, mostly unfertile and little used territory in the Minas Gerais state that the Brazilian government decided to dedicate for a profitable activity back in the 1970's.

### 2- Impact on local fauna and flora

Based on genetically selected eucalyptus clones that have a unique reputation locally, BioEnergia trees are almost sterile. This means they cannot multiply outside our cultivated parcels and disrupt the local ecosystem and flora. Therefore, they are not an invasive species.





Furthermore, **Aperam BioEnergia maintains native forest areas as a protected reserve for local biodiversity.** Here, species are protected from possible fires and diseases. We also monitor their development level and occasionally replant the land with local species to ensure a sound balance of nature.

We've also developed an **extensive flora and fauna monitoring project** that enables the identification of species and encourages conservation. Since monitoring began in 2006, we have identified around 264 species of birds (4 of which are threatened with extinction and 21 endemic) and 34 species of medium and large mammals, of which more than one-third are threatened with extinction (such as the giant anteater and the ocelot).

### 3- Impact on CO<sub>2</sub> emissions and soil quality

Because of the continuous improvement of our genetic selection and practices, the BioEnergia forest is augmenting the volume of CO<sub>2</sub> stored on an annual basis, making it a **"carbon sink."** **This claim was certified in 2021 by external parties.** This is due to the fact that CO<sub>2</sub> is also sequestered in the tree's roots, along with in the trunks that will later be carbonized to produce charcoal.

Furthermore, after harvest, leaves and twigs are left on the ground where they naturally decompose into humus. This process not only aerates and enriches the soil with nutrients, but also keeps humidity, thereby stimulating underground biodiversity.

Lastly, our **recognized forestry management** systematically avoids the use of chemical fertilizers and pesticides that would eventually concentrate into the soil and water. This is in line with the Forest Stewardship Council practices.





## Eucalyptus are considered heavy water consumers, reducing the resources available for other species. Are BioEnergia's eucalyptus really different?

### 1- Eucalyptus compared to other species

Like all vegetation, eucalyptus indeed requires water and nutrients to grow and survive. However, the biological efficiency of the eucalyptus tree's wood is higher compared to other agricultural cultivations. For example, it takes 1 thousand liters of water to produce 2 kg of corn, 500 g of potatoes, or 400 g of cerrado wood. That same amount of water produces almost 2.9 kg of eucalypt wood - much less than the volumes needed for coffee or cattle, two local activities in the Jequitinhonha Valley. In fact, studies show that **eucalyptus consumes the same amount of water as native forests**.

### 2- Genetic selection of BioEnergia's specific trees

Thanks to our local Research & Development initiatives, genetic improvement technology has been available for decades. Using this technology, we've been able to continuously adapt our trees to the dry local conditions, making our saplings particularly well-suited to the unique environmental conditions of Vale do Jequitinhonha (Aperam's only unit in a regular hydric stress).

**This careful genetic selection also deprives the plants of the so-called pivoting roots that can reach water tables.** As a result, our forests rely on superficial layers of water for a fully sustainable use of local resources that does not endanger deep reserves. This contributes to the preservation of soil extracts and water resources.

### 3- Water-conscious forest management

BioEnergia continuously develops and applies measures to control and sustainably use water, as it is the planet's most vital resource. For example, it organizes the systematic recycling of the water used at the nursery and develops awareness with local communities, with the support of the [Acesita Foundation](#).

To further reduce its impact, over the past several years, **BioEnergia has committed to a real operational challenge: to reduce the need for irrigation by only planting only during the rainy season and, more specifically, on rainy days.** This practice, which is unique in the sector, concentrates our planting from October to March. It also requires a very careful monitoring of a number of topics, including: human resources, weather forecasts, machinery logistics, etc.

Aperam BioEnergia also aims to optimize the efficiency of rainwater. This is done using 40 waterproofed pools excavated at strategic points and that catch up to 260 thousand m<sup>3</sup> of rainwater as well as the use of containment basins. The latter prevent sudden flows to leach the soil or erode the rivers' banks while also facilitating the infiltration of rainwater into the soil.

# Is BioEnergia really following best practices?

We believe it is important to work together with external experts. This is why BioEnergia maintains important partnerships with organizations dedicated to forests in Brazil, such as AMIF (Associação Mineira da Indústria Florestal), SIF (Sociedade de Investigações Florestais), IPEF (Instituto de Pesquisas e Estudos Florestais) and the IEF (State Forestry Institute). All of these organizations help us benchmark our practices and improve.



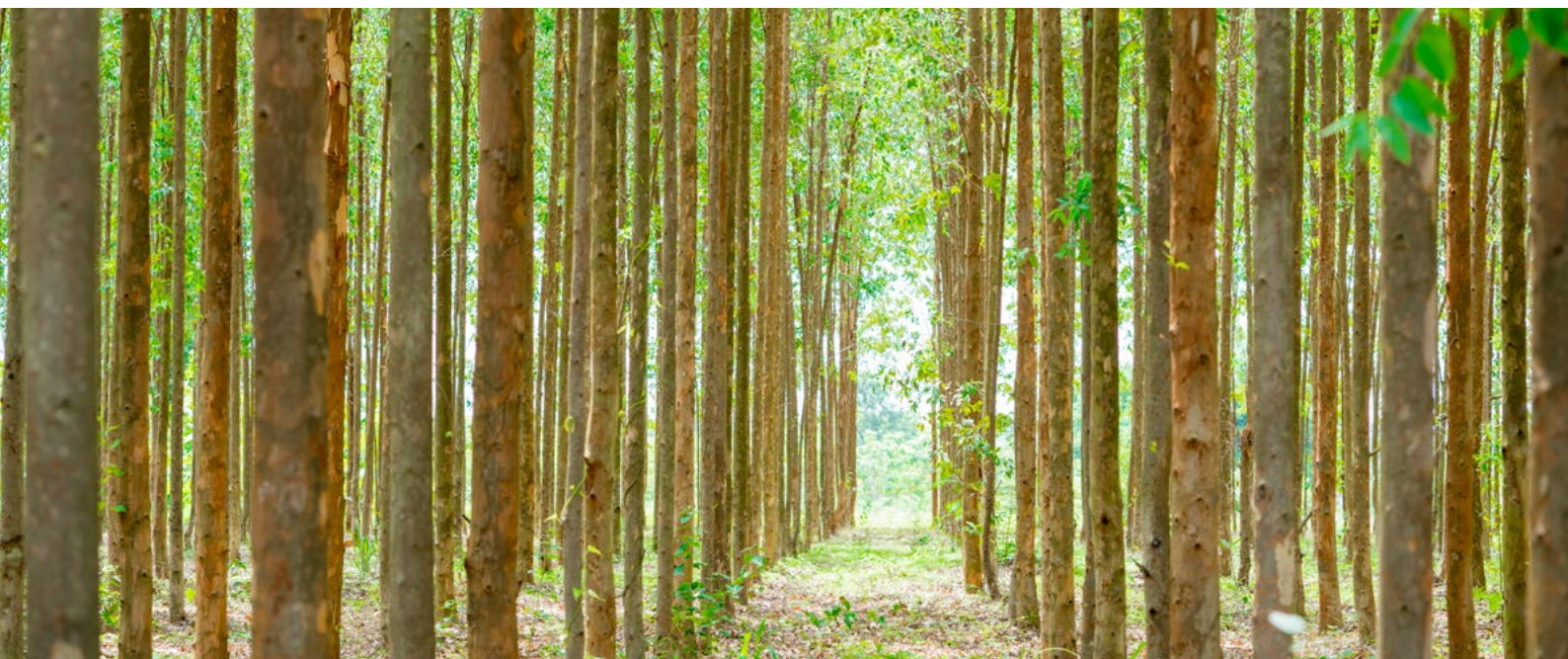
The mark of  
responsible forestry

In addition, our forests are FSC®-certified. This external certification with yearly surveillance audits ensures that they are responsibly managed, provide environmental benefits, and conserve biological diversity, water resources, soils, and unique and fragile ecosystems, amongst others. We are also certified under ISO 14001, which proves our effectiveness in environmental management.

We have won several awards, each of which indicate that BioEnergia is an innovator and is widely recognized amongst its peers, for developing forest management practices and protecting biodiversity.

For example, in 2019, we earned the III **Best Environmental Practices Award of the State of Minas Gerais**, for our “**Degraded Areas Recovery**” project. Developed over the last 15 years, this project aims to take advantage of organic residues such as wood bark from the charcoal production process to recover soil quality.

In 2021, we received Brazil Ministry’s Semad Recommend Seal, which promotes the preservation and maintenance of an ecologically balanced environment in Minas Gerais. This honor was granted to our programs “**Integrated Pest Management (MIP)**”, which consists of the development of ecological solutions for the biological control of forest pests such as the release of natural enemies after careful impact analysis.



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