An investigation into the Global Environment Facility-funded project **"Production of sustainable, renewable biomass-based charcoal for the iron and steel industry in Brazil"**

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This investigation aims to contribute towards assessing the impacts of **"Production of sustainable, renewable biomass-based charcoal for the iron and steel industry in Brazil"**, [1] a project in Minas Gerais, southeastern Brazil, funded by the Global Environment Facility (GEF) and implemented by the United Nations Development Program (UNDP) and the Government of Brazil. It comprises a desk-top assessment of the project's Mid-Term Review (MTR) and other documentation, and a report on a three-week site visit in October 2019 to the areas affected by iron and steel production, charcoal production and eucalyptus plantations, in order to gather on-the-ground evidence of the project's impacts.

Charcoal production unit in Lamim built with GEF finance. **Federica Giunta**

1. Introduction

1.1 The Siderurgia Sustentável project

The project "Production of sustainable, renewable biomass-based charcoal for the iron and steel industry in Brazil" is being implemented in Minas Gerais by UNDP and Brazil's Ministry of Environment. The project's budget is 43,950,000 USD of which 7,150,000 USD is provided as a grant by the Global Environment Facility (GEF) and 36,800,000 USD is provided as co-financing by the private-sector and national government.

The project is more commonly known locally as *Siderurgia Sustentável* (Sustainable Iron and Steel Production Project) and is supported by the Brazilian Ministry of Science, Technology, Innovations and Communications, the Ministry of Industry, Foreign Trade and Services, the Ministry of Agriculture, Livestock and Supply and the Minas Gerais State Government, among other public and private-sector partners such as universities. It began in April 2014 and is due to end in June 2020.

The project aims to reduce the greenhouse gas emissions from the iron and steel sector in the Brazilian State of Minas Gerais by developing and demonstrating cleaner conversion technologies for "sustainable" charcoal production, and implementing a supportive policy framework for it. Charcoal is considered "sustainable" if it is "renewable", i.e. the wood is sourced from tree plantations (as opposed to "non-renewable" if wood is sourced from forests), and produced in modern furnaces which are more efficient and less polluting than traditional methods. In Minas Gerais tree plantations for charcoal production are exclusively eucalyptus monocultures.

The State of Minas Gerais has developed legislation to eliminate non-renewable charcoal from the market and replace it with charcoal produced from eucalyptus plantations. At the national level, the Brazilian government has established voluntary emissions reduction targets for the iron and steel sector which are largely based on replacing the use of coal or non-nonrenewable charcoal with "sustainable charcoal".

Despite the funding and support available to the iron and steel industry to achieve these aims, the sector has not responded as hoped. This is for a number of reasons, including: technological developments are still needed to make charcoal production cleaner and cheaper; poor market conditions and low commodity prices mean producers tend to source their charcoal from the cheapest suppliers; and iron and steel companies prioritise economic efficiency and financial feasibility over environmental concerns. As a consequence, the sector has postponed new investments in technological research and charcoal production facilities, and has continued to use charcoal produced in traditional kilns.

The project aims to address these barriers through funding technological developments and incentivising fuel switching (from coal or natural gas to charcoal), which are implemented by iron and steel companies partnered with university research institutions. At the time of the project's Mid-Term Review (MTR), seven proposals had been selected from five companies: Plantar, Rima, ArcelorMittal, Vallourec and PCE/Cossisa. The MTR projected that the proposals would result in 300,315 tons/year of charcoal production capacity using more efficient/cleaner technologies and achieving gravimetric yields (efficiencies) higher than 33% (compared to 25-29% with traditional methods), and an average emissions reduction of 1,415 kg CO_2 eq/ton of charcoal. Therefore, around 425,000 tons of emissions reductions would be achieved each year. Since the MTR was published, PCE/Cossisa has withdrawn its proposal. The table below summarises the proposals being carried forward, the level of funding they have received and the associated production capacities and estimated emissions reductions. [2]

Company	Description	Production capacity (tons of charcoal per year)	Estimated emissions reductions (kg CO_2eq per ton of charcoal)	Funding contracted (USD)[1]
Vallourec	Fuel switch from burning natural gas to charcoal residues in the pelletizing oven of a steel plant	0	1,347	314,000
Plantar	Increased gravimetric yield in charcoal production through temperature control	21,150	666	560,000
ArcelorMittal 1	Installation of monitoring units for temperature control and increase in gravimetric yield in charcoal production	270,000	1,502	210,000
ArcelorMittal 2	Burning methane produced from charcoal production		513	300,000
Rima 1	Increased gravimetric yield through temperature control in charcoal production	4,200	1,000	772,000
Rima 2	Burning methane produced from charcoal production	0	1,000	255,000
		Total new productive capacity (tons per year)		**295,350**
			Average emissions reductions (kg CO_2eq per ton of charcoal)	**1,005**
			Total funding contracted (USD)	**2,411,000**

[1] These figures are quoted in the project's MTR. However, a significant drop in exchange rate since it was published means that these equivalent values in USD are now lower, since contracts were awarded in Brazilian Reais.

The project is essentially supporting industry to reduce the production costs of "sustainable charcoal" in order to incentivise its use above non-renewable charcoal or coal. In the longer-term, it is also aiming to add value to the industry's operations through selling carbon credits generated through the methane emissions avoided by the technological developments, or overall carbon emissions avoided from switching from fossil fuels to charcoal (all of the proposals listed above would in theory be eligible).

Although in recent years there has been a reduction in total consumption of iron and steel, the industry remains the largest industrial emitter of greenhouse gases in Brazil. In response to national climate change policies and to take advantage of the international market for CO_2 certificates, the Brazilian iron and steel sector now also focuses on developing eucalyptus plantations for charcoal production as a carbon sink to offset the sector's emissions.

1.2 *The eucalyptus-charcoal-iron and steel supply chain in Minas Gerais*

Brazil is the world's largest producer of charcoal and produced 5.2 million tons in 2017, 90% of which was used by the iron and steel industry, with 80% of the charcoal being produced from wood from plantations. [3] The iron and steel sector is also the largest industrial source of carbon dioxide emissions in the country. [4] Approximately 70% of Brazil's iron and steel production occurs in the State of Minas Gerais, and the sector is unique because 34% of iron production uses charcoal instead of mineral coke/coal, and charcoal is widely used in steel production too. Historically this has been due to a lack of mineral coke in Brazil, but abundant forests from which to produce charcoal. In Minas Gerais there are currently nine steel plants and 41 iron mills [5] which produced 3.1 million tons of pig iron[2] in 2018, of which some 50% was exported. The large iron and steel companies have invested heavily in eucalyptus plantations to secure charcoal production. Despite the fact that these companies are vertically integrated and have their own plantations, the charcoal production process itself is usually outsourced to local contractors, who in turn contract individual laborers. [6]

Given that pig iron production is the principal user of charcoal in Brazil, charcoal acquisition represents a large percentage of production costs, averaging as much as 40%. Pig iron producers tend to control production in order to protect their profit margins, especially since the cost of the charcoal produced from planted forests can reach 100 USD per ton, a value much higher than charcoal produced from native forests, which can make pig iron production uneconomic. [7]

Since the use of wood from native forests in charcoal production is being gradually phased out in Minas Gerais, the distance between charcoal production sites and pig iron plants has increased (charcoal can be sourced up to 1000km away from where it is used), which has also increased costs, and compelled the industry to control production further.

In 2018 Brazil had 5.7 million hectares of eucalyptus plantations, and Minas Gerais continues to have the largest area of plantations in the country, accounting for 24% (1.4 million hectares) of Brazil's eucalyptus. [8] The vast majority of it is linked to the iron and steel industry, and demand for charcoal (and to a lesser extent for pulp and paper) has led to the progressive destruction of the forests and savannas

Felling work at a eucalyptus plantation in Minas Gerais. **Federica Giunta**

[2] *Pig iron or "crude iron" is used in steelmaking, and is produced by burning iron ore with charcoal or mineral coke.*

of the predominant Cerrado biome, and their replacement with extensive commercial monoculture tree plantations. Over the past decades eucalyptus plantations have been responsible for dramatic deforestation rates of up to 200,000 hectares per year. [9]

The Cerrado biome is the world's most biodiverse savanna, but it has now lost 52% of its vegetation cover which is compromising water sources, rivers and streams, and drying up springs. According to the umbrella group *Campanha Nacional em Defesa do Cerrado* (National Campaign in Defence of the Cerrado), the principal threat to the survival of the Cerrado is the indiscriminate advance of the agricultural frontier for the production of eucalyptus, soya and cattle ranching in particular. [10] Cerrado vegetation is also crucial for regulating water cycles across the region. Evapotranspiration in the Cerrado and Amazon influences rainfall in the midwestern and southeastern parts of the country, and reduced evapotranspiration in the Cerrado can lead to reduced rainfall patterns in the Amazon too. The deep root system of native Cerrado vegetation maintains the water balance in the region and is capable of generating rainfall even in dry years. The importance of the Cerrado for water availability throughout Brazil is reflected in the fact that it feeds eight out of the 12 different hydrological regions in the country. [11]

Of the charcoal produced in Minas Gerais, it is estimated that 80% comes from small and medium producers. They opt for low-cost, labor-intensive and low-skilled traditional charcoal production technologies, which are inefficient and polluting (though this criticism applies to all charcoal production), but can respond to fluctuating market conditions and have therefore endured for decades. [12] In addition, work in charcoal production is often associated with inhumane working conditions, unfair and exploitative labour practices and child labor. Job contracts are typically temporary, salaries extremely low and workers are not protected by social welfare. [13] Conditions akin to slavery are common in Brazil's charcoal industry, an issue which has been fought extensively by civil society. In 2014 a fifth of entries listed on Brazil's "dirty list" of companies accused of slave-labour were charcoal producers. [14]

There are also several health risks common to this production model including high physical strain and exposure to excessive solar radiation and heat emitted by furnaces, but the main risk is exposure to smoke and fumes released from the carbonisation process. According to data from the Jorge Duprat Figueiredo Safety and Occupational Health Foundation, people who are in permanent contact with wood combustion smoke and charcoal dust are 10 times more likely to develop respiratory conditions because of it. [15]

Charcoal for the iron and steel industry in Minas Gerais. **Federica Giunta**

Pig iron plant in Minas Gerais. **Federica Giunta**

Smoke from traditional charcoal production in Minas Gerais. **Federica Giunta**

2. Methodology

2.1 Desk-top assessment of the Mid-Term Review (MTR) and other documentation

Although GEF was only able to supply one of three annual monitoring reports (the 2018 PIR) for this project, the MTR was provided by UNDP staff. Other project documentation available on the UNDP website [16] was also reviewed. Follow-up questions relating to the content of this report have been discussed with UNDP, although independent audit reports for the six projects receiving financial support (detailed in the table in Section 1.1) would not be disclosed, making a more detailed assessment of these projects and their emissions reduction claims impossible. A statement was also provided by UNDP in response to this investigation (Section 9).

2.2 Site visit to project implementation areas

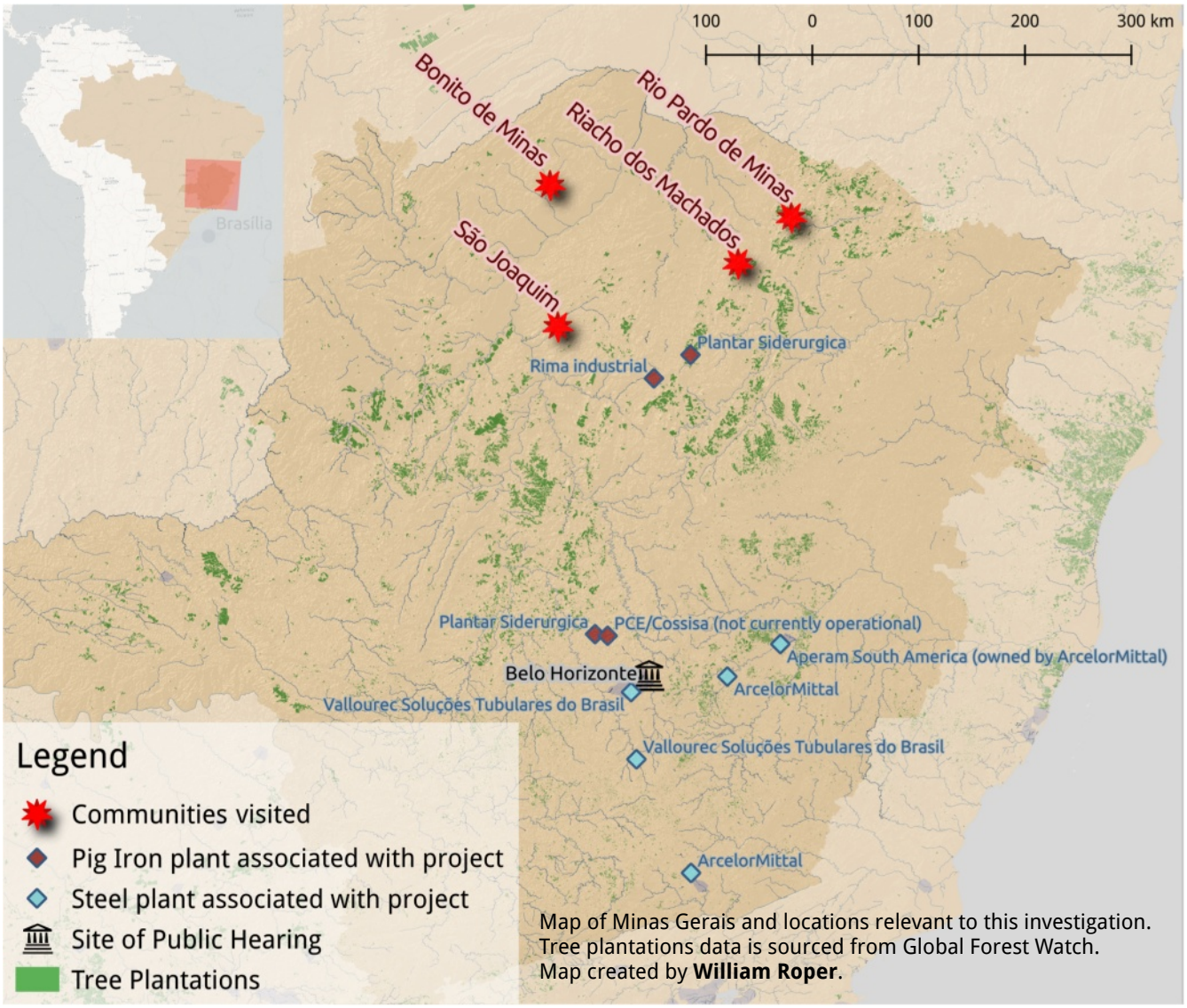
The aim of the site visit was to document the impacts of charcoal production for iron and steel production and eucalyptus plantations on the environment and communities in Minas Gerais. A researcher commissioned by the Global Forest Coalition spent three weeks in Minas Gerais focusing on areas with high concentrations of eucalyptus plantations in the northern and southern regions of the state, as well as in the iron and steel hub around the state capital Belo Horizonte.

Interviews were conducted with key actors using a semi-structured interviewing methodology based on an interview guide created for the research involving ten central guiding questions, with more specific questions sometimes added and adapted to the specific interviewee. The key actors were representatives of impacted communities and their support groups, and a number of independent experts. Names of interviewees have not been published due to concerns for their safety. Unless otherwise stated, the information contained in Section 6 (Results of the site visit) is sourced from these interviews.

The research began at the second annual *Encontro de Comunidades Tradicionais Veredeiras do Norte de Minas* (Meeting of Traditional *Veredeiras* Communities of the north of Minas Gerais), which took place 18-20 October 2019, in the district of São Joaquim, municipality of Januária, northern Minas Gerais, in order to speak to communities in the area that have been impacted by eucalyptus monocultures.[3] The following week was spent in northern Minas Gerais, which has a high concentration of eucalyptus plantations, in the areas around Montes Claros, including Bocaiuva and Curvelo to the south and Januaria, Bonito de Minas and Rio Pardo de Minas to the north.

The second week focused on the state capital, Belo Horizonte, where representatives of the institutions that

[3] *Veredeiras* are a Brazilian ethnic group from the junction between the states of Minas Gerais, Bahia and Goiás. They live in the Cerrado biome, on the plateaus and near waterways and they farm on common land, raise livestock such as cattle, horses, goats and pigs, and gather fruits from Cerrado trees. Like other traditional peoples and communities, *Veredeiras* face conflicts over access to land and natural resources, which includes conflicts with companies involved in charcoal and eucalyptus production.



Map of Minas Gerais and locations relevant to this investigation. Tree plantations data is sourced from Global Forest Watch. Map created by **William Roper**.

are involved in the project were interviewed, which included a visit to a steel producer in Sete Lagoas, the Barão de Mauà company.

In the third week the first "sustainable" charcoal production unit built as part of the project was visited in Lamim, southern Minas Gerais, as well as the near-by University of Viçosa campus.

In total more than 20 interviews were conducted. One difficulty encountered in the field work was the sheer size of the research area, given that the state of Minas Gerais is approximately the size of France.

2.3 *Acknowledgments*

The authors of this case study would like to acknowledge the support of FASE Espírito Santo, the *Centro de Agricultura Alternativa do Norte de Minas* (CCA/Centre for Alternative Agriculture in northern Minas Gerais), and Leninha Souza, a regional representative of Brazil's Worker's Party (PT) in Minas Gerais, in carrying out the site visit.

4. Results of the desk-top review of project documentation

The following problems have been identified with the project:

4.1 No consideration given to the social and environmental impacts of eucalyptus plantations

There has been no assessment of the current or historical impacts of eucalyptus plantations as a source of biomass for charcoal production, and it has been assumed that the simple fact of wood being sourced from a plantation qualifies it as being "renewable" biomass. This issue was identified in the project's STAP review prior to approval (although this did not influence the approval), which stated: *"There seems to be no project component or activity aimed at producing plantation biomass sustainably. It is presumed that financial resources for sustainable biomass production through plantations will come from other sources."* [17] As stated in the MTR: *"...there was no need for a full environmental and social assessment as a number of mitigative measures had already been included in project activities. In particular with respect to the issue of potential expansion of planted forest within the properties managed by the companies supported under the Project (via the tender mechanism), they would have to comply with existing environmental licensing, labor laws and sustainable management requirements."*

The Environmental and Social Screening Checklist [18] conducted as part of the project proposal process states that *"the project may contribute indirectly to the conversion of already modified habitats by incentivising forest plantations due to increased demand for sustainable charcoal. ...forest plantations are managed rational businesses following best practices regarding sustainability... producers must ensure that the wood used in charcoal production is sourced from forests that are managed in a sustainable manner and have to comply with the Brazilian Environmental Legislation... The project will only provide direct support to charcoal production facilities that demonstrate that their wood is sourced from existing licenced forest plantations. Thus, for activity under the direct influence of the project, there is no risk that the project will cause deforestation or the conversion of land to forest plantations. On the contrary, by increasing the yield of charcoal per hectare of planted forest, the project will decrease the need for additional forest plantations in the charcoal production facilities it directly supports."* As is documented in detail in this investigation, eucalyptus plantations managed for charcoal production are conflict-ridden and result in numerous environmental impacts. It is also demonstrated that the project's first charcoal production facility is being used alongside existing traditional furnaces, and therefore increases production capacity and demand for wood. Given the likelihood of future production facilities doing the same, the project is incentivising further land conversion to commercial eucalyptus plantations. The lack of a detailed environmental and social assessment of such a central aspect of the project is deeply problematic.

4.2 Directly subsidising companies with poor track records

Although the project was originally aimed at all scales of the charcoal sector in Minas Gerais, including small and medium producers that represent most of the production capacity, four large companies, all with poor track records (see Section 5 for details), have in effect been directly subsidised using public climate finance to increase charcoal production (or switch to using charcoal), which in turn increases demand for wood and therefore eucalyptus plantation areas. This is a perverse incentive for deforestation, as more Cerrado is converted to plantations or other land-uses are displaced by plantations which in turn results in more deforestation, and ensures ongoing conflict over land with traditional peoples in the area.

4.3 Project facilitating an increase in demand for wood

Rather than replacing traditionally-produced or non-renewable charcoal with "sustainable" charcoal, and in the process reducing demand for wood and carbon emissions through increasing efficiency (gravimetric yield), the project is facilitating an overall increase in production, albeit with slightly less polluting technology. This requires more wood and therefore plantation expansion, and will result in continued high levels of emissions. The project will facilitate an increase in production of some 300,000 tons per year, representing an almost 6% increase in Brazil's total annual charcoal production.

For the charcoal to be classed as "sustainable", efficiency increases are actually only around 3-11% greater than traditional methods, and still only 32-36% overall. What the project is actually trying to achieve is reducing the production costs of so-called sustainable charcoal so that the industry can create an economic and steady supply of socially-acceptable charcoal that meets legislation and is eligible for carbon credits (which can offset the increased production costs). This is also the only option open to the industry and its continued operation, since non-renewable charcoal can't supply market demand due to issues of scale and transportation distances (as well as there being a partial ban on the use of native wood for charcoal production since 2018 in Minas Gerais, limiting its use to only 5% of total wood), and mineral coal is also becoming less viable due to climate concerns. A constant charcoal supply from eucalyptus plantations is therefore vital to the industry's future.

4.4 Emissions reductions based on flawed accounting rules for biomass

The climate rationale of the project is based on a fundamental biomass carbon accounting error, where plantation forestry is considered a "sustainable source" of biomass and therefore "renewable", and CO_2 emissions from its carbonisation are not accounted for at all, only methane emissions are considered.[4] To highlight this, one way that emissions reductions are claimed is by flaring methane when charcoal is carbonised, thereby turning it into CO_2 which has less of a climate impact. However, the extra CO_2 released in the process is still not accounted for.

What is meant by "renewable" biomass in practice is wood from commodified supply chains. However, carbon emitted from burning wood sourced from forests (classed as "non-renewable" biomass) is accounted for, at least for the purpose of climate finance and carbon credit methodologies such as the Clean Development Mechanism (CDM). This double standard means that charcoal from plantations is treated very differently to charcoal from forests, even if both practices result in deforestation, whether directly or indirectly. Numerous recent studies have highlighted this accounting flaw, [19] including in relation to plantation forestry. For example, recent analysis by experts in carbon lifecycle modeling revealed that even burning thinnings from sustainably-managed plantations increases carbon pollution in the atmosphere for more than four decades. [20] This is due to the time it takes for carbon to be accumulated by new trees in the plantations, and is a significant factor even at the relatively short rotation cycles associated with Brazil's eucalyptus plantations.

4.5 Adding value through fraudulent carbon credits

A component of the project is allowing companies the possibility of adding value to charcoal production or offsetting their own emissions through generating carbon credits either from burning "sustainable" charcoal instead of "non-renewable" charcoal or mineral coal, or from reducing methane emissions from the charcoal production process. All four companies subsidised as part of the GEF/UNDP project have already sold carbon credits at one time or another, [21] and according to once source, Plantar alone received over 5 million USD in the first year of its enrollment in the World Bank's Prototype Carbon Fund (see Section 5.1 for more details). [22] Carbon trading in this way not only rewards companies for highly polluting and damaging activities, but allows other industries to carry on polluting through purchasing the credits rather than reducing their own emissions. The net result is that the amount of carbon in the atmosphere is increased by both the seller and the buyer.

[4] Under accounting rules agreed for the Kyoto Protocol and subsequently transferred to the Paris Agreement, carbon dioxide emissions from burning "renewable" biomass are ignored. See UNFCCC CDM methodology for the "Reduction of emissions from charcoal production by improved kiln design and/or abatement of methane" used by the project here: https://cdm.unfccc.int/filestorage/C/D/M/CDM_ACMGLDFY2DBQ28IL272V2VCPLD2L4J6NA/EB67_repan08_ACM0021_NM0341.pdf?t=V0t8cThoOTdnfDD7r2qurmEcLTtbtmmV-TsY

The impacts of eucalyptus plantations on women in Brazil

In a number of its publications, the World Rainforest Movement has documented many examples of specific impacts on women due to the expansion of eucalyptus plantations in Brazil. In summary:

Turning Prairies into Green Deserts in Brazil [23]

Women from local communities living amongst eucalyptus plantation projects for the pulp and paper industry in the State of Rio Grande do Sul in Brazil report significant negative impacts with almost no benefits. Women recount their loss of cultural identity as farmers, as women play a significant role in family farming, particularly in milk production. The change of landscape from family farms to large-scale tree monocultures compromises the livelihoods of family farmers and decreases local food production due to the conversion of land to plantations. This leads to displacement and migration of rural populations to the cities as well as a loss of their local knowledge of rural production, including for example, women's traditional practices related to medicinal plants. When women migrate to the city, they often can only find employment as domestic workers in urban households.

When it comes to job opportunities in plantations, women are often not afforded jobs as they are generally given to men. When men go to work at the eucalyptus plantations, women must takeover tasks on the farm, and with no support for household chores, women experience an overburden of work. When women do have access to jobs in the plantations they usually occupy less visible roles as cooks or in the eucalyptus seedling nurseries where they experience adverse health impacts from exposure to chemical products and injuries from repetitive work. The employment, which is usually unstable, is mostly offered to workers that are not from the local community but other municipalities.

Women also detail accounts of violence, fear, sexual harassment and sexist attitudes, often suffered at the hands of male plantation workers who do not belong to the community. There have also been reports of coercion and assault experienced by women who refuse to sell their lands to plantation companies.

Women, Forests and Plantations: The Gender Dimensions [24]

Plantations of introduced tree species that replace primary forests often do not have the non-timber forest products seen in primary forests, for example, household items, food and medicines. Women are dependent on forest ecosystems as they are traditional collectors of vegetables, firewood, medicinal plants, and water.

Commercial tree plantations trigger a change in the availability of resources usually found in forests that women rely on. This leads to various impacts such as a lack of food, firewood, medicine and water (water scarcity is particularly associated with with eucalyptus plantations, as described in Section 6). Such scarcity leads to an increase in women's work burden and also a decrease in the amount of resources they are able to collect.

Cases from Brazil show that when women work in the commercial plantations themselves, they usually undertake unskilled, menial jobs, for example sprayers of pesticides and fertilisers, cooks, maids or working in tree nurseries. Without medical check-ups and awareness of health impacts of their work, for example due to the effects of exposure to pesticides and chemicals on reproductive health or to continuous exposure to cold water in the nurseries, women find themselves facing significant injuries, accidents and diseases. The working conditions in plantations are also minimal for both women and men, with low pay (women's salaries are often lower than that of men), seasonal work, and outsourcing to contracted workers.

Impacts of Eucalyptus Monocultures on Indigenous and Quilombola Women in the State of Espĩrito Santo [25]

Large-scale eucalyptus plantations in Espírito Santo in Brazil established in the 1960s and 1970s by agribusiness Aracruz Celulose (formerly Fibria and now Suzano) left a path of destruction for indigenous and *Quilombola*[5] communities and their territories, and in some cases caused irreversible losses. The destruction of rainforest and replacement of eucalyptus plantations not only led to loss of land, displacement and family separation but also loss of food, raw materials for handicrafts, biodiversity for natural medicines (including for women's family planning and reproductive health) as well as loss of rivers and streams, which were meeting places for women. Those people who remained on their territories were forced to live with pollution from agrochemicals and with degraded ecosystems that disrupted their way of life and their roles within their family and community. Either through unemployment or selling their labor to agroindustry itself, men's roles weakened which led to increased cases of alcoholism and domestic violence. Women were forced into jobs as domestic workers and day labourers for officials of Aracruz Celulose.

[5] *Quilombas* are residents of quilombo settlements first established by escaped slaves in Brazil.

4.6 *Civil society, gender and the concerns of traditional communities ignored*

Although it is claimed that *"civil society organizations (CSOs) would also be included as stakeholders with the aim to include transversal themes into the sustainable charcoal agenda"*, only WWF Brazil and Imaflora (a non-profit that certifies forestry operations and and charcoal production, among other activities) have participated as stakeholders. Thus, a large range of CSO stakeholders including the traditional communities of the region have been ignored. Similarly, gender issues have not been addressed *"as women and girls were not designated beneficiaries of the Project. Disaggregation of data to track participation in project supported activities by gender (e.g., training workshops) was not a requirement of GEF at the time of project approval."* There is clear evidence of the gender-differentiated impacts of industrial and agricultural processes, and in particular commercial eucalyptus plantations in Brazil [26] where women have been exposed to violence and sexual harassment, have even less secure land rights and are even more vulnerable to loss of livelihood. There is simply no excuse for gender impacts to have been ignored in the project design.

5. Track record of companies supported through the project

5.1 ***Plantar:*** *contracted to receive 600,000 USD from GEF grant*[6]

Pig iron producer Plantar is a vertically-integrated company that owns eucalyptus plantations for charcoal production, and has received substantial support through the project to develop new production facilities. Plantar operates a pig iron plant near Sete Lagoas to the north of Belo Horizonte, and in 2010 owned over 180,000 hectares of mainly eucalyptus for charcoal production, almost all of which is in the north of Minas Gerais. It also managed more than 590,000 hectares of plantations for itself and for other companies in Brazil [27] (more recent figures are not publicly-available). Plantar is also one of the world's largest producers of eucalyptus seedlings, producing 140 million trees a year and managing nurseries for other companies, including large pulp and paper producers. [28]

Plantar argues that its industrial eucalyptus plantations absorb carbon, but the trees have a life cycle of seven years and there is no evidence to support the claim that such a short life cycle can contribute to carbon sequestration. In fact, research shows that plantations do not begin to balance lost CO_2 through vegetation clearance and soil disturbance disorder until at least 10 years of growth. [29]

As described in first-hand accounts from interviews involving communities in northern Minas Gerais, where people have joined together to oppose the impacts of Plantar's operations they have been silenced by a persistent campaign of manipulation and intimidation by the company. [30] For example, the company might offer work to a family member to create tension and divisions within a community, and if this does not work, more drastic measures are taken, such as phone calls threatening "accidents", or even death threats directed at relatives of those seen to be involved in organising. Plantar has also been involved in illegal landgrabbing in Minas Gerais (see Section 5.4).

Eucalyptus plantations in northern Minas Gerais. **Federica Giunta**

[6] This figure is quoted in the project's MTR, however a significant drop in exchange rate since it was published mean that the equivalent value in USD is now lower since the contract was awarded in Brazilian Reais.

Carbon credits through "green pig iron" and "certified plantations"

Plantar has for many years attempted to generate carbon credits through its operations, described in a BankTrack Dodgy Deal [31] and detailed extensively in *Carbon Trading: a critical conversation on climate change, privatization and power*. [32] Plantar entered into two contracts with the World Bank to deliver carbon credits under the CDM which clearly highlight the problems with this approach. One project aimed to reduce methane emissions from charcoal production by flaring it instead of releasing it to the atmosphere, but was discontinued due to the limitations of using traditional small charcoal kilns. [33] ArcelorMittal and Rima are hoping to achieve this using a much larger kiln, facilitated by the GEF/UNDP project.

Another project approved in 2009 under the World Bank Carbon Fund rewards the company for using charcoal from eucalyptus plantations instead of coal in pig iron production. In fact, Plantar claimed that in the absence of finance through carbon credits the company would switch from using eucalyptus charcoal to coal as it would not be able to replant plantations entering their final rotation, a claim that was widely disputed by civil society. Plantar and the World Bank promoted the project as a model operation that would plant trees, enhance workers' safety and foster environmental education projects for children. However, it has been documented that the company's operations have illegally dispossessed traditional communities of their land, destroyed jobs and livelihoods, dried up and polluted local water resources, depleted soils, harmed the biodiversity of the native Cerrado biome, threatened the health of local people, and subjected their workforce to exploitative labour practices and appalling working conditions. [34]

The claimed emissions reductions are also based on a flawed carbon accounting methodology, as described in Section 4.3 above. Plantar claimed that 3 tons CO_2eq per ton of pig iron produced would be avoided, where coal releases 1.9 tons CO_2eq into the atmosphere, and eucalyptus plantations *remove* 1.1 tons CO_2eq per ton of pig iron. [35] Through the scheme Plantar would be able to claim more than three million tons of avoided CO_2 emissions over a 30-year period, which could bring the company about 45 million USD from its buyer, the Netherlands CDM Fund, a Dutch Government program managed by the World Bank. [36]

Eucalyptus plantations in northern Minas Gerais. **Federica Giunta**

5.2 ***Rima:*** *contracted to receive over 1 million USD from GEF grant*

Pig iron producer Rima is another vertically-integrated company that owns its own eucalyptus plantations for charcoal production. Rima has a pig iron plant in Bocaiúva in northern Minas Gerais and owns around 50,000 hectares of eucalyptus plantations in the area. Similarly to Plantar, Rima claims that its plantations sequester up to 1 million tons of CO_2 a year. [37]

Bernardo de Vasconcellos Moreira, a director of Rima who at the time was also an elected Federal Deputy, was convicted of fraud involving charcoal used in Rima's pig iron plant in 2014. The case was presided over by the Public Prosecution Service of the State of Minas Gerais, and it became known as the "charcoal mafia" case. [38] Between 2005 and 2010 (before Moreira was elected) a large volume of charcoal burned by Rima was classed as "renewable" when in fact it came from the illegal deforestation of Cerrado forests. Rima had been knowingly signing-off illegally-obtained charcoal as coming from eucalyptus plantations, which allowed them to source charcoal at considerably cheaper prices. [39]

5.3 **ArcelorMittal:** *contracted to receive over 500,000 USD from GEF grant*

ArcelorMittal, a multinational industrial conglomerate of steel and mining companies based in Luxembourg, is another controversial company that has benefited directly from the project. The company has operations in more than 60 countries and is the world's largest producer of steel, with an annual production capacity of 130 million tons. It employs around a quarter of a million people world-wide and in 2018 had a net income of 6 billion USD.

In 2019 ArcelorMittal was fined more than three million Reais (around half a million USD) by the Municipal Secretary for the Environment of Vitória, in Espírito Santo (a state bordering Minas Gerais) for breaching air quality regulations involving particulate matter and dust released from its operations. [40] The company had already been fined twice in 2016 for the same reason. In another case against the company in Espírito Santo, in 2015 a Parliamentary Commission of Inquiry (PCI) concluded that ArcellorMital was one of a number of companies responsible for "black dust" that had been plaguing local residents. [41] The Tubarão Port in Vitória is the largest iron ore export terminal in the world and since 2009 local residents had complained of "black dust" in their homes, which was found to be a combination of iron ore and other air pollutants. [42]

Furthermore, following the two tragedies involving collapses of tailings dams at Vale's mines in Mariana and Brumadinho in Minas Gerais, ArcelorMittal has been increasingly under the spotlight for a toxic waste dam at one of its own mines that is also at risk of collapse in Minas Gerais. 71 families have so far been removed from the area that would be affected by a collapse in the Serra Azul mining complex in Itatiaiuçu, until repair work and monitoring is carried out. [43]

5.4 **Vallourec:** *contracted to receive over 300,000 USD from GEF grant*

Vallourec is a large multinational manufacturing company based in Paris, specialising in steel tubes, automotive parts, and stainless steel. It has over 18,000 employees in more than 20 countries. In Brazil Vallourec owns around 113,000 hectares of eucalyptus plantations to produce charcoal for its steel tube production plants in Belo Horizonte and Jeceaba, in southern Minas Gerais. [44] Plantar has also been contracted to manage Vallourec's plantations in northern Minas Gerais.

Vallourec was implicated in a campaign of intimidation and violence in northern Minas Gerais, which culminated in the murder of a local farmer in 2007 by the company's armed guards. Antonio Joaquim dos Santos was a 32-year-old father of four from Canabrava, who was gathering firewood with his daughter when two of Vallourec's guards attacked and shot him in front of his daughter. The Canabrava community had previously complained about the intimidation and violence they were being subjected to by Vallourec's guards, as well as the deforestation of the Cerrado that was taking place for Vallourec's eucalyptus plantations. The company had cut off the community's access to firewood and other forest resources such as fruit, and the plantations were drying up the Canabrava River. Vallourec's response to the complaint was to subject the community to further intimidation and harassment, including subjecting farmers and even children to verbal and physical violence. [45]

Following the murder, numerous civil society organisations including *Rede Alerta Contra o Deserto Verde* (Green Desert Alert Network), *Centro de Agricultura Alternativa do Norte de Minas* (Centre for Alternative Agriculture in northern Minas Gerais), *Comissão Pastoral da Terra de Minas Gerais* (Minas Gerais Pastoral Land Commission of), *Fórum Regional de Desenvolvimento Sustentável do Norte de Minas* (Regional Forum for Sustainable Development in northern Minas Gerais), and *Movimentos dos Trabalhadores sem Terra* (Landless Rural Workers Movement) took up the issue with state authorities and human rights organisations, demanding immediate action against the company. [46]

As described in the report *Certifying the Uncertifiable*, [47] which looked in detail at Vallourec and Plantar's plantations in Minas Gerais in 2003, disputes between small farmers and the companies were rife, and their plantations had devastated the way of life of the *geraizeiros* (a term used to describe the traditional peoples that live in the Cerrado ecosystem, known as *Gerais*, in northern Minas Gerais). Disputes were caused by banishing family agriculture and cattle-raising from previously public land, farm boundary disputes, agrochemical use, blocking roads and disrupting access,

poor water management and the destruction of the Cerrado forests in the area. Promised economic benefits had not been realised, with few jobs created and minimal payment of local taxes. In addition, the two companies were guilty of sub-human labour conditions, excessively long working hours, child labour, illegal outsourcing, subjection of the workers, irregular transportation, unhealthy and degrading work, blacklisting of worker leaders and a lack of freedom and union autonomy, all of which was meticulously documented in the reports of a Minas Gerais Parliamentary Investigation Commission. [48]

Impacts on water resources are another serious consequence of Vallourec and Plantar's operations in northern Minas Gerais, where water is increasingly scarce in and contaminated by agrochemicals used in plantation management. Dozens of municipalities have in the past declared a "state of public emergency" due to a prolonged drought directly related to large-scale eucalyptus monocultures.

According to a legal advisor to the Rural Workers Union of northern Minas Gerais, Vallourec and Plantar have also been closely involved in fraudulent land acquisition processes and illegal logging in Minas Gerais through their eucalyptus plantation operations. Large areas of land that they have converted to eucalyptus plantations were leased to them long-term through public land use concessions on *terras devolutas* (so-called vacant lands) awarded by the state, where it was claimed that the land was empty and unused and in need of economic improvement. Other lands have been obtained through private purchases from larger land owners (*fazendeiros*), as well as through pressuring smaller owners and farmers to sell their rights of use and inheritance claims to land. Through intermediates, the companies have attempted to legalise land acquisition through fraudulent processes such as drawing up "contracts of promise of purchase" (*contrato de promessa de compra e venda*) for untitled land. [49] In the past, communities in northern Minas Gerais have reported that in some areas up to 90% of the land that plantation companies have come to own was originally held by the state and previously used in traditional ways by the local people. Throughout Minas Gerais iron and steel companies were directly incentivised through tax breaks to plant eucalyptus on public lands, to the extent that by the early 2000s only a quarter of the vast area that had been planted in the state was done so on private lands that the companies had paid for. [50]

Since the murder in 2007 companies like Vallourec and Plantar have softened their approach in order to improve their image and reputation, through communicating and negotiating more with the different stakeholders and painting themselves as sustainable companies. However, in large part the damage caused by the plantations has already been done, with hundreds of thousands of hectares of conflict-ridden plantations already providing charcoal to the iron and steel industry, the lands and livelihoods of traditional communities destroyed, and with little hope of land leased from the state being returned to communities.

Extensive eucalyptus plantations in northern Minas Gerais. **Federica Giunta**

5.5 ***PCE/Cossisa:*** *originally due to receive over 300,000 USD from GEF grant, but withdrew its proposal after the MTR was published and after having received 10% of the contracted grant*

PCE/Cossisa is a consortium that owns a pig iron plant in Sete Lagoas, to the north of Belo Horizonte, but that has been closed since the financial crash in 2008. The company continues to produce charcoal for four other iron and steel plants from its 7,500 hectares of eucalyptus plantations in Curvelo, in the centre of Minas Gerais, and is looking to reopen its pig iron plant in future. Being a medium-size producer there is very little publicly available information on the company.

However, an Imaflora "verification report" [51] carried out in 2018 as part of the project describes how the company has weak health and safety procedures, and almost no socio-environmental performance control in its plantations or charcoal production sites. The company also has no written procedure for handling complaints, and does not have a traceability system or management plan, which report authors state could compromise the execution and control of activities carried out in plantations and charcoal production sites. In addition, there is no monitoring of charcoal production efficiencies or emissions, no monitoring of working hours or food and accommodation conditions provided to workers, and sanitary facilities are inadequate. The company also does not have a coherent system in place to monitor inputs and outputs of wood or charcoal, and does not have an annual record of total volumes.

The contents of Imaflora's report are deeply concerning, especially given that the company had already been contracted by UNDP some three months before the verification inspections had taken place. Further still, PCE/Cossisa received the first payment from the project less than two months after the verification inspections had taken place, and certainly not before any of the report's recommendations could have been put into place (although this proposal has now been withdrawn it is unclear whether payments already made to the company have been since returned). This seriously calls into question PCE/Cossisa's suitability to be a recipient of such a large amount of public climate finance, or the company's ability to accurately monitor and report on the project's progress had it been implemented.

Eucalyptus plantations for charcoal production in the iron and steel industry. **Federica Giunta**

6. Results of the site visit

6.1 *Nothern Minas Gerais: the expansion of the agricultural frontier*

In contrast with the "industrial" central region of the state, northern Minas Gerais is predominantly rural and continues to be a "frontier" between the Cerrado forests and grasslands and the expansion of commercial agriculture, eucalyptus plantations and mining. Eucalyptus was first planted in northern Minas Gerais in the 1970s and 1980s on large estates occupying the plateaus. Planting was carried out by privately-owned iron and steel companies and business groups that received state and municipal support in the form of tax incentives and other financing.

Communities that previously occupied and used the land were profoundly affected by plantation expansion, which caused many territorial disputes with traditional populations. The plateau areas were regarded as common land, where cattle were grazed and fruits and other products could be gathered. These areas of the Cerrado are rich in natural pasture, medicinal plants, fruits and other natural resources. Resources were owned and used commonly, with rules and principles guiding their use established by traditional communities in line with ecological limits. However, this traditional form of land use was not recognised in the national legal system, which only differentiated between public and privately-owned lands.

Some of the lands involved in plantation expansion were privately owned and sold to plantation companies, but the vast majority of land was classified as public *terras devolutas* ("vacant lands") and handed over to plantation companies in concessions by state institutions (supported with strong fiscal incentives) or fraudulently titled as private land through various landgrabbing processes.

Decades of poor land use practices have had devastating impacts on the local environment, which are predicted to worsen over the coming years. According to a study commissioned by the Ministry of Environment, the northern third of Minas Gerais is at risk of desertification in the next 20 years due to the land management practices it has been subjected to over the past six decades. These include deforestation, the expansion of monoculture tree plantations and intensive agricultural and livestock production. This would impact severely on the area's 2.2 million inhabitants. [52]

Bonito de Minas, Rio dos Machados and Rio Pardo de Minas are three places in northern Minas Gerais that have been impacted over the last 40 years by eucalyptus plantations for charcoal and pulp and paper, and were therefore included in the site visit. The increase in the vulnerability of the local populations of northern Minas Gerais is proportional to the environmental degradation they suffer, and eucalyptus is a significant cause of social and environmental conflicts in the region.

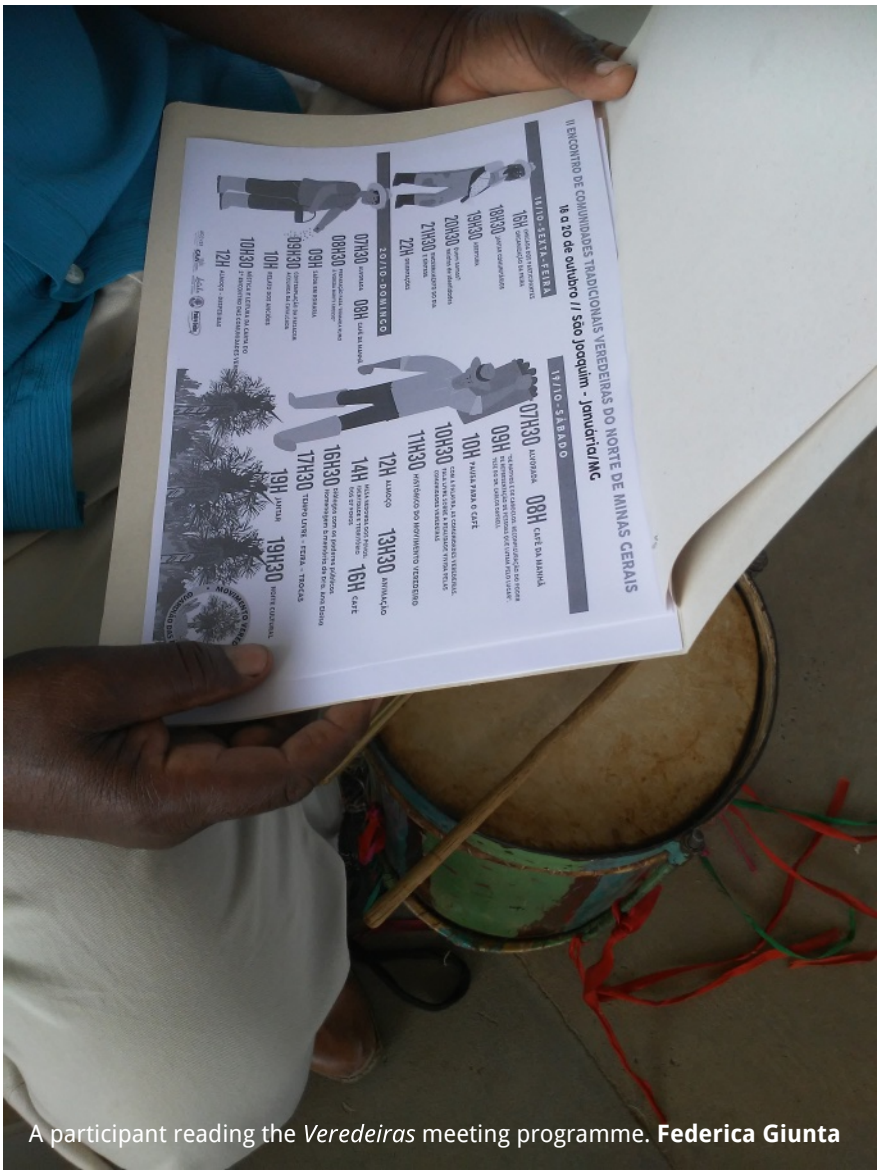
Extensive eucalyptus plantations in northern Minas Gerais. **Federica Giunta**

6.2 *Meeting of traditional Veredeiras communities of the north of Minas Gerais, 18-20 October 2019*

The annual meeting of the *Veredeiras* communities in northern Minas Gerais brought together 250 representatives of the diverse traditional communities, Indigenous Peoples and *Quilombola* communities of the area, and was attended as part of the site visit. *Veredeiras* are the traditional people of the Brazilian Cerrado and have suffered significant repression and criminalisation due to conflict with agri-business, mining companies and iron and steel-linked tree plantations. Through the interviews conducted and speeches that were delivered during the meetings, the pressures placed on communities from these land management practices was made clear. Members of the communities of Bonito de Minas, Rio Pardo de Minas, Rio dos Machados and São Joaquim pointed to the forest being in "crisis" due to the constant expansion of eucalyptus plantations for the iron and steel and pulp and paper sectors. Communities described how, since the 1970s, there has been a strong incentive in Minas Gerais for plantations, where land is leased by the state at very low prices to plantation companies that have expanded across the plateaus previously covered by the Cerrado's biodiverse forest savannas. In northern Minas Gerais alone more than one million hectares of eucalyptus has been planted on *terras devolutas*, which are vital to community resilience.

Communities also discussed how the promise of job creation has not been realised as workers are required only in very specific phases of the process, especially in the clearing and planting stages at the start and then in the cutting and charcoaling at the end, leaving at least a five-year period in the middle with very little employment. Most of the wealth is generated when iron and steel are exported to foreign markets, and is never seen by the communities impacted by the plantations.

Participants at the *Veredeiras* meeting. **Federica Giunta**



A participant reading the *Veredeiras* meeting programme. **Federica Giunta**

The ecological impacts of the plantations were also described in detail, including the impacts of eucalyptus on hydrology by lowering the water table and drying streams and water courses, and the application of pesticides and other agrotoxics. Monoculture eucalyptus was clearly viewed as the least environmentally friendly option, even in comparison to the impacts of other cash crops such as coffee, sugarcane, rice and beans or cattle pasture.

In addition to the struggle against the degradation of their environment, communities struggle for a recognition of their basic rights, which are constantly undermined by new policies and an increasingly "technical-scientific" discourse that limits their participation in development processes.

Community members and their political representatives called for a re-evaluation of resource extraction activities and denounced the lack of care shown by public institutions which have abandoned these communities and excluded them from decision-making. With infrastructure and services geared towards resource extraction instead of the public good, young people increasingly feel that there is no future for them in their communities and are forced to leave, reinforcing a downwards economic and social spiral.

At the end of the meeting, participants published the *Carta de São Joaquim*, a statement issued to local authorities and decision-makers that included the following statements and demands, some of which were directed towards Plantar and Rima: [53]

"Considering the environmental and socio-cultural diversity of the region, and the right to the territory and traditional ways of life, knowledge and practices; considering that traditional peoples and communities are known for the rational use and conservation of natural resources; …and considering the degradation of the Cerrado suffered due to unsustainable land uses involving monoculture crops, intensive use of agro-toxics, rampant deforestation, charcoal production, and intensive burning…; to the government and the large companies, especially Plantar and Rima, we demand the return of land that was illegally taken, the development of management and conservation plans for degraded areas, and actions contributing towards the restoration and recovery of the Cerrado ecosystem and plateaus; …and the suspension of eucalyptus planting…and the replanting of degraded areas, promoting the recovery of native Cerrado vegetation".

Local produce on display at the *Veredeiras* meeting. **Federica Giunta**

Participants at the *Veredeiras* meeting. **Federica Giunta**

6.3 Bonito de Minas

Bonito de Minas has around 10,000 inhabitants and is located close to the Pandeiros river basin, which was designated as an Environmental Protection Area (APA)[7] for its ecological importance and to protect the Cerrado ecosystem and the San Francisco river, which is the longest river that runs entirely in Brazilian territory. The region has been occupied for centuries by traditional peasant farming communities with their own cultural practices. But in the 1970s, the introduction of charcoal production by the state as a new economic activity to meet demand from the iron and steel industry marked a big shift in the environment and culture of the area.

A *pequi* tree that has died due to water stress in an area impacted by eucalyptus plantations. **Federica Giunta**

One local resident who is a representative of the community and local Rural Workers' Union describes how Rima (previously Metalur) has impacted the area: *"Metalur is now Rima, they are running the plantations here, and the impacts have been huge. We now have the problem of drought, which has impacted the Jabuticaba river. The traditional Veredeiras communities have been to the Public Ministry to tell them that we don't want plantations here, and that we say no more because of the significant environmental damage they cause. We don't want a repeat of the problems, we want to find a way to rescue the springs and restore the water we had before."*

6.4 Rio dos Machados

A visit was also made to Riacho dos Machados, a municipality in the Rio dos Machados area in northern Minas Gerais. Two inhabitants of the community of Peixe Bravo described the impacts of eucalyptus plantations in the area. Their community is most worried about water scarcity and the additional pressures that eucalyptus places on this semi-arid region.

"They say it is a resource, but ending nature is costly. Why are the springs drying up? Because eucalyptus changes the course of the earth and doesn't let water down into the ground and then into the springs. And after an area has been deforested and planted with eucalyptus, the water runs off the land and doesn't infiltrate, it goes away. They even dig containment ditches but it doesn't help. There should be water there on the plateaus, but when they plant eucalyptus not even a drop of water reaches the springs. The companies come from outside and plant thousands of hectares, and they grab land. Only when the eucalyptus is removed will the water come back. Now they want to plant again, but I say this: no."

Another pig iron company, Minasligas, has eucalyptus plantations in this area, and in response to criticism over the environmental impacts of them has been trying to improve its image through interspersing the eucalyptus with *pequi* trees, a native Cerrado species that is particularly important for the resilience and sustenance of families of this area. However, according to the interviewees, the experiment did not last long: the *pequi* trees that had not dried up and died through lack of water in the first months after planting were subsequently suffocated by the eucalyptus.

"They said they were going to do a sustainable plantation project, involving native trees, like the pequi. The first year was normal, the second was normal, but the third year wasn't. The trees didn't produce fruit. The pequi is a tough tree, and tall, but the eucalyptus grew around it, closed the canopy and suffocated the native trees. On paper it's sustainable, but in practice it isn't. Eucalyptus kills everything, and there aren't any more native trees."

[7] Permanent Preservation Areas (PPA) are protected areas with strict rules governing their access and use, and direct economic exploitation is not allowed. Landowners must delimit the area according to the forest code and enclose it with natural fences (such as native trees) or physical barriers (wire fences) to prevent the entry of livestock and human activities such as cultivation, collection of firewood and hunting.

6.5 *Rio Pardo de Minas*

Rio Pardo de Minas in the upper Rio Pardo region is another community that has experienced conflict because of eucalyptus plantations. Representatives of community-based organisations described the impacts that plantations have had there. The municipality has a high rate of deforestation which has resulted in conflicts over land with traditional communities of *geraizeiros*, who depend on the natural environment for their survival and traditional practices. The Centre for Alternative Agriculture in northern Minas Gerais reports that *"Eucalyptus monoculture has come to dominate the landscape. Deforestation, which is still being carried out, does not respect trees such as pequizeiro, pananzeiro, mangabeira and other fruit that is rich in vitamins and proteins that are important sources of food for rural people"*.

Reclaiming land through *retomadas* (reclamations) is a way for communities of family farmers to resist eucalyptus monocultures. The practice has been going on since the initial conflicts over land in the region in the 1970s, when companies established themselves in the area to develop irrigated agriculture, grain monoculture, eucalyptus and charcoal, supported with tax incentives from the state. The *retomadas* take place on common land that were once *terras devolutas*, and which were ceded by the state of Minas Gerais to companies.

One community-led movement to come out of the conflicts over eucalyptus plantations is the *Movimento dos Encurralados pela Monocultura de Eucalipto* (Movement of communities surrounded by eucalyptus monocultures), which built momentum from the *Rede Alerta Contra o Deserto Verde* (Green Desert Warning Network), which operated in several states including Minas Gerais in the 2000s. The fact of being surrounded or "cornered" by eucalyptus is something that many small farmers in Alto Rio Pardo relate to, and has been important in building the identity of this movement.

As well as losing access to land and the resources it provides, two other central issues that communities in this area organise around are water scarcity and agrotoxics. Clean water is vital to rural communities, but extensive eucalyptus plantations are highly water intensive, drying up springs and water courses. Large plantations also require high fertilizer and pesticide input, which pollutes already fragile hydrology, as well as impacting on human health.

Traditional *geraizeiro* communities in the area have also been subjected to threats and violence when confronting landgrabbing, with the private security forces of large families responding to occupations with gunfire. *Geraizeiro* leaders have also been singled out and attacked in local towns at the behest of landgrabbers. [54]

According to legal advisors and *geraizeiro* activists, the attacks are taking place because traditional communities are organising to retake their traditional territories. Land which used to belong to the state of Minas Gerais was leased to eucalyptus plantation companies for long periods, on the promise of economic development and improvement in the quality of life for local people. This has not materialised, and instead communities find themselves significantly worse off. Worse still, after the lease contracts expired in many cases the land was "grabbed" by the companies through a process known as *grilagem*[8], leaving communities with little recourse to reclaim what is rightfully theirs other than through extended and expensive court proceedings.

In 2011, the Vereda Funda community in Rio Pardo de Minas undertook the *Agricultural Restoration Project: from monoculture eucalyptus to agro-silvo-pastoral systems*. The project has become an example of the successful restoration of springs and riparian forests, showing that it is possible to restore the Cerrado ecosystem where it has been destroyed by eucalyptus plantations. The project aims to return 170,000 hectares of land that were leased to plantation companies during the 1970s and 1980s to 3,000 *geraizeiro* families that live in communities in the area. [55] Another emblematic example was the development of the *Sustainable Development Reserve (RDS) Nascentes Geraizeiras*, approved in 2014 after nine years of struggle by communities in Vargem Grande do Rio Pardo, Montezuma and Rio Pardo de Minas. This reserve covers an area of 38,177 hectares and is intended to protect approximately 200 streams and springs that supply the region with water, as well as to protect the traditional agricultural practices of *geraizeiro* communities. [56]

[8] The term comes from a technique used to falsify documents. Documents were put in a box with crickets (*grilos*), whose excrement made the paper look old, creating a private land title for common or state-owned land.

6.6 *Public hearing in Belo Horizonte: Retomada da Regularização Fundiária Rural em Minas Gerais (Resumption of Rural Land Regularisation in Minas Gerais)*


Leninha Souza speaking at the public hearing. **Federica Giunta**

Attending a public hearing on the *Resumption of Rural Land Regularization in Minas Gerais* [57] on 22nd October 2019 with the legal advisor of the Rural Workers Union of northern Minas Gerais, André Alves de Souza, was an opportunity to explore the issue of landgrabbing of rural land. The subject of the public hearing was the *terras devolutas*, that have in the past been leased on a large scale to eucalyptus companies by the state for very long periods and at very little cost. Despite being classed as "vacant", the lands were previously used by traditional communities who should have had legally-recognised rights of tenure over them. Instead, they lost access to them and remain vulnerable to further loss of land rights due to ongoing illegal acquisition and the complicity of state bodies. Now that a number of concessions are coming to an end, the *geraizeiros* movement is organising to reclaim their land through collective land titles, and to prevent concessions being re-contracted for destructive land uses.

The public hearing was hosted by the Legislative Assembly's Human Rights Commission (ALMG), and saw the participation of the Minas Gerais Federation of Workers in Family Agriculture (*Federação dos Trabalhadores na Agricultura Familiar*/FETRAF Minas Gerais) and the United Movement of the Rural Workers Unions of Alto Rio Pardo (*Movimento Articulado dos Sindicatos dos Trabalhadores Rurais do Alto Rio Pardo*).

For FETRAF MG, security of land tenure is key to food production and commercial farming, and to furthering rural development. It is also fundamental for small-scale farmers to being able to access credit and other financing, and support from public policies. *"Without a land title, the farmer is at a disadvantage. It is only through land ownership documentation that he can invest in production"*, said Lucimar Martins, coordinator of Fetraf MG. *"Since we are the hands that feed the nation, food producers who preserve nature's resources, restoring springs and working with agroecology, we should be more respected and valued. Without us the city will not have lunch or dinner"*.

The progress of the Land Regularisation Programme is an initial milestone for family farmers in northern Minas Gerais, and will help communities to access support for their work, which in turn will generate jobs and income for those who need and want to live in the rural areas. *"Without a land title, everything becomes insecure in our lives,"* said Marilene Pereira of the *Federação dos Trabalhadores na Agricultura do Estado de Minas Gerais* (FETAEMG/Federation of Agricultural Workers in the State of Minas Gerais). *"Without regularised land, the farmer finds it difficult to benefit from policy support, access water and sell produce from family farms."*

Gaining legal rights to land is an uphill struggle for traditional communities. For decades, the development model based on the industrialisation of the agricultural frontier, modernisation of rural areas and economic growth for large companies has been totally dominant, and has resulted in vast areas of common land being passed into private hands. The social benefits that were promised have not materialised, peasant farmers have been displaced and there has been a large rural exodus. The *geraizeiros* were no match for the power of a state-sponsored iron and steel industry and its ever-increasing demand for charcoal, which pushed the expansion of eucalyptus plantations into northern Minas Gerais.

Landgrabbing for eucalyptus has fundamentally restructured land use and land ownership in Minas Gerais, and whilst the historical, political and economic drivers of it are common throughout the state, the actual mechanisms of it are locally specific and differ according to and the web of companies involved and the power structures in a particular place.

6.7 *"Sustainable" charcoal production units supported through the project*

In November 2019 the first "sustainable" charcoal production unit to be built through the GEF/UNDP project was visited. The demonstration unit in Lamim, southern Minas Gerais, is on the property of *fazendero* (owner of a large farm) Amador Reis de Matos, which has around 40 hectares of eucalyptus plantations, with another 2000 hectares in the immediate vicinity owned by neighboring *fazenderos*. Amador planted eucalyptus for charcoal production some 30 years ago, and was a pioneer in the area: subsequently, most of the large landowners in the area also dedicated much of their land to growing eucalyptus for charcoal production in traditional furnaces.

According to Professor Cássia Carneiro, coordinator of the Department of Forestry Engineering at Federal University of Viçosa (UFV) and involved in the demonstration unit, the furnace system being developed improves the efficiency of wood conversion to charcoal, and burns the gases generated during the process to release fewer pollutants. As shown in the photos, the new technology is not particularly sophisticated, and methane mitigation is achieved through secondary combustion (which can also be referred to as flaring) rather than any capturing or processing of the gas emitted. It is also unclear how the emissions will be accurately monitored, given the lack of any visible monitoring equipment.

Amador now owns four "sustainable" furnaces and more than eight traditional ones, and reports that the new furnaces produce less smoke, but do require more care to be taken in the quality of the wood that is used in them. All of the traditional furnaces were also in operation at the time of the visit, suggesting that overall charcoal production capacity had been increased, rather than shifting from traditional to "sustainable" production.

Traditional charcoal kilns in operation at demonstration unit in Lamim. **Federica Giunta**

"Sustainable" charcoal production: new demonstration unit in Lamim. **Federica Giunta**

Traditional charcoal production at demonstration unit in Lamim. **Federica Giunta**

8. Conclusions

In conclusion, this case study has covered the following points:

On-the-ground research to document the impacts of eucalyptus plantations for charcoal production in Minas Gerais reveals significant impacts on communities and its fragile Cerrado biome. Over the past five decades huge areas of common land have been taken from the *geraizeiros* and turned into monoculture eucalyptus plantations. These plantations have deforested highly biodiverse forest savannas, dried up and polluted water courses and threatened the whole northern region of the state with desertification. The traditional peoples of the area have lost access to land that they should have had rights of tenure over, and which for generations ensured their food sovereignty and sustained their cultural practices. The project has not carried out an assessment of the social and environmental impacts of eucalyptus plantations and has ignored the evidence of the gender-differentiated impacts of eucalyptus plantations in Brazil.

Despite the claim that the project is reducing wood demand it is more likely that the new charcoal facilities will be used alongside existing traditional methods rather than replacing them. This is increasing production capacity and therefore demand for eucalyptus, and creating a perverse incentive for plantation expansion. This is known to be the case for the first operational charcoal facility funded through the project.

Four companies with highly questionable track records have been directly subsidised by the project. Plantar and Rima have been associated with substantial historical landgrabbing, and are still singled out by communities for the impacts that their plantations are having on biodiversity and water courses. In addition, Rima was recently exposed as being involved in the "Charcoal Mafia" which fraudulently sourced illegal charcoal produced from deforestation at significantly lower prices, and Vallourec has in the past been complicit in violence against local communities and the murder of a farmer through the actions of its armed guards. ArcelorMittal has been fined numerous times for air quality breaches which directly impact the health of surrounding communities, and poor working conditions with

Charcoal to be used in iron and steel production.
Federica Giunta

Evidence of desertification in northern Minas Gerais.
Federica Giunta

weak health and safety practices have been recorded at PCE/Cossisa's charcoal production facility (although this company is no longer involved in the project).

The emissions reductions figures quoted by the project so far are based on a flawed carbon accounting methodology that treats all wood sourced from a plantation as "renewable", even if land was deforested to create the plantations, and therefore ignores any carbon dioxide emissions when it is turned into charcoal and burned. More and more scientific evidence refutes this approach. If emissions were to be properly accounted for (i.e. taking into account changes to forest carbon stocks and land-use change), it would be clear that charcoal production at this scale cannot be considered "sustainable", no matter how efficiently it is produced. Similarly, efforts to make "sustainable charcoal" production eligible for internationally-traded carbon credits are highly problematic as they wrongly ignore most of the carbon emissions from the process, meaning that when credits are traded net emissions to the atmosphere are increased, both by the seller and the buyer.

This project is a good example of the dangers of private-sector involvement in climate finance, where commercial interests are prioritised over impacts on communities and the environment. International finance for climate change mitigation should be transformational rather than papering over the emissions of a large industrial sector through false accounting methodologies. In this case, financing a reduction in demand for iron and steel through for example reducing the production of new private cars or other end-uses of iron and steel would be far more effective.

Similarly, community-led forest and ecosystem restoration is a far more effective climate mitigation strategy than commercial tree plantations. A recent study shows how natural forests are 40 times better at storing carbon than plantations. [58] Community-led forest restoration also has many other co-benefits including sustaining the livelihoods and cultural practices of forest-dependent peoples, protecting and enhancing the role of women in agricultural production and conservation, protecting biodiversity and regulating hydrological cycles. In order for communities to effectively protect and restore forests and other ecosystems, they must have legally-recognised and secure land rights. Supporting the efforts of the *geraizeiros* in their struggle to reclaim their ancestral lands for collective use would therefore constitute an effective climate mitigation action.

It is hoped that this case study will provide a critical alternative perspective to the monitoring and evaluation reports that are produced as part of the project, so that a more accurate assessment of its impacts can be made.

9. Statement from UNDP in response to this investigation

Attributable to a UNDP Spokesperson:

The climate crisis is one of UNDP's highest priorities. UNDP supports Brazil and some 170 countries and territories, in achieving their climate targets under the Paris Agreement, and in advancing the 2030 Sustainable Development Goals agenda.

The Global Environment Facility-funded project "Production of sustainable, renewable biomass-based charcoal for the iron and steel industry in Brazil" aims to improve social and environmental standards in the charcoal production chain in Brazil, which will deliver various environmental and social benefits. As the project is ongoing, results are currently being assessed and verified. The project does not have activities on indigenous or quilombos land in Minas Gerais, neither has activities in the state of Espírito Santo. UNDP works closely with local communities to develop climate action projects that are just and sustainable. Protecting the human rights of indigenous peoples is a top priority for UNDP. Over the last decades, opportunities to support the intersection between climate action, conservation and indigenous peoples has increased, underlining clear global recognition that local communities and indigenous peoples are vital custodians of biodiversity and that are key stakeholders of climate adaptation and mitigation actions. The climate emergency can only be tackled if the rights and welfare of communities and indigenous peoples are ensured and mitigation and adaptation actions can directly benefit their livelihoods.

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