

Profit before people and planet

How economic policies and corporate profit maximisation perpetuate the unsustainable exploitation of the Brazilian Amazon and its people

December 2022



The Global Advocacy and Policy team at Christian Aid led the research and overall preparation of this report.

December 2022.

Acknowledgements:

This report was prepared as part of a collaborative initiative between Christian Aid, the Financial Transparency Coalition and Latindadd, implemented as a component of ‘the Forest Custodians’ project.

Some subsections of this report partly draw on research conducted by Instituto Justiça Fiscal (IJF), which we are particularly grateful for.

Invaluable input was generously provided by Matti Kohonen (Financial Transparency Coalition), Luis Moreno and Klelia Guerrero (Latindadd), Juan Carlos Ochoa, Emma Burgisser, Oliver Pearce, Nadia Saracini, Fiona Smyth (Christian Aid) and Maria Regina Paiva (Instituto Justiça Fiscal).

Christian Aid exists to create a world where everyone can live a full life, free from poverty. We are a global movement of people, churches and local organisations who passionately champion dignity, equality and justice worldwide. We are the change makers, the peacemakers, the mighty of heart.

christianaid.org.uk

Contact us

Christian Aid
35 Lower Marsh
Waterloo
London
SE1 7RL
T: +44 (0) 20 7620 4444
E: info@christian-aid.org
W: caid.org.uk

Christian Aid is a member of

actalliance

Contents

Contents	4
Executive summary	6
1. Introduction	9
2. Brazil's significant cumulative tax exemptions	12
3. High vertical ownership concentration across the aluminium value chain in Brazil	15
4. MRN as a case study	18
4.1. Social and environmental impacts of MRN's operations	18
4.2. Tax exemptions received by MRN	24
4.3. Main benefits received by MRN's shareholders	27
4.4. Tax exemptions across the aluminium value chain	32
4.5. Responsibilities of those MRN's shareholders that are its main buyers	36
5. Conclusions and recommendations	40
Annex	47
End notes	52

Cover: Some of the area deforested by Mineração Rio do Norte in Oriximiná. Picture taken in 2016.

Photographs: Carlos Penteadó.

Executive summary

To contribute to bringing about transformative change in the industrial mining industry, this report demonstrates how state tax policies and corporate short-term profit maximisation are two key underlying drivers of the unsustainable exploitation of the Brazilian Amazon and its peoples by industrial bauxite mining. Specifically, this report contributes to a better understanding of the magnitude of the problems these factors create and who benefits from them. We analysed the aluminium value chain in Brazil's Amazon, with a particular focus on the operations of the bauxite mining company *Mineração Rio do Norte* (MRN) as a case study.

MRN's mining operations in Oriximiná have caused the deforestation of extensive areas of tropical forest and serious adverse human rights and environmental impacts on Quilombola and riverine communities. According to research conducted by Brazilian civil society organisations and researchers, MRN's mining operations have polluted watercourses, hindering the access of these communities to quality water, generating diseases and impacting on fishing activity.¹ Existing research has also documented that deforestation induced by MRN's mining operations has affected access to food and natural resources that support livelihoods for these marginalised communities, such as Brazil nut harvesting.² Communities in Oriximiná have also described how the loss of forests and biodiversity have contributed to a loss of local or indigenous knowledge, which makes it harder for people to survive on their land and makes them more reliant on mining companies.³

Brazil's tax policies grant large tax exemptions throughout the aluminium value chain in Brazil's Amazon and large aluminium producers and mining companies have effectively maximised their economic benefits resulting from these policies through several actions. Regarding bauxite mining companies, this report shows how, through just one corporate tax exemption, MRN benefited more than the approximate combined revenues raised by the municipality of Oriximiná through taxes, fees and charges taken over a ten-year time period.⁴ At the same time, it is unclear how much the municipality of Oriximiná has benefited economically from mining, particularly because of the lack of transparency on key elements of the tax exemptions bauxite mining companies receive; certainly, the environmental and social toll is high. The benefits of this one tax exemption to MRN are then compounded by other significant tax exemptions, building a substantial cumulative benefit for MRN.

Tax exemptions to bauxite mining companies cut directly into the budgets of the state and municipalities tasked with providing public services and investing in sustainable development.⁵ This foregone tax revenue is felt disproportionately by Quilombola,⁶ indigenous and riverine communities, who have been custodians of the forests for centuries and who would benefit most from improved public services and environmental regulations. By so doing, these tax exemptions reinforce existing dynamics of intersectional social exclusion and serious regional inequalities in Brazil.⁷ At the same time, these tax exemptions directly increase the profits of bauxite mining companies, presumably incentivising their operations and thus perpetuating the unsustainable exploitation of Brazil's Amazon by this sector.

Large aluminium producers and mining companies, particularly multinational enterprises, have effectively maximised their economic benefits resulting from Brazil's tax policies, notably by concentrating ownership within the three levels of the aluminium value chain and by adopting a trade pattern characterized by a very high percentage of transactions between related parties. Most of the sector is under the control of just a few international aluminium producers and mining companies. As a result of the policy decision by the Brazilian government to grant tax exemptions to all levels of the aluminium value chain and the described practices by these companies, a few international aluminium producers and mining companies have benefited from massive cumulative tax exemptions across this value chain, including the exemptions received by MRN and the other two other bauxite mining companies operating in Brazil's Amazon. In effect, these tax policies transfer the wealth of the Brazilian Amazon's global commons – unique tropical forests, water supplies, mineral resources and ancestral lands collectively managed – into the hands of a few large international mining companies and aluminium producers. Ultimately, these policies and practices trap the region in an unsustainable extractive development model, which has serious impacts for both the peoples of the Amazon, particularly the indigenous, Quilombola and riverine communities, and the Amazon biome.⁸

This report also examines short-term profit maximisation by these companies as a structural driver of the unsustainable exploitation of Brazil's Amazon. We demonstrate that large aluminium producers and mining companies, particularly multinational enterprises, have significant influence in, and benefit in various ways from, the operations of bauxite mining companies operating in Brazil's Amazon. This report focuses on

Norsk Hydro, Alcoa, Rio Tinto and South32 as those multinational enterprises that, in addition to having a shareholding in one or more of these mining companies, source or have sourced significant amounts of bauxite from them.⁹ Based on these findings, these large international aluminium producers and mining companies have a responsibility for the operations of bauxite mining companies in Brazil's Amazon and should take appropriate actions to prevent and mitigate adverse human rights and environmental impacts, according to well-recognised international standards on business and human rights.¹⁰

Yet, our research demonstrates that these international companies have largely failed to take appropriate actions to prevent and mitigate adverse human rights and environmental impacts related to MRN's operations, with only Norsk Hydro reporting that it had taken partial action to address some of these concerns, neglecting to use their significant influence in MRN's operations to effectively prevent and mitigate its adverse human rights and environmental impacts. In fact, these companies have sourced, and continue sourcing, large amounts of bauxite from MRN that, not least because significant tax exemptions, increase their profits over the short-term, while also receiving other economic benefits from MRN's operations. This behaviour puts short-term profit maximisation before the people and environment of the Brazilian Amazon.

This report concludes by making recommendations to relevant actors in this field. Ultimately, Brazil's tax policies and corporate short-term profit maximisation are two key structural factors that must be changed to protect the biodiversity of Brazil's Amazon and the communities that have protected it for centuries.

1. Introduction

The Amazon rainforest and its peoples are central for the global climate and environment. The Amazon, which covers 1.4 billion acres of dense forests and constitutes half of the planet's remaining tropical forests,¹¹ being 10 times the surface area of France, is the most important terrestrial biome on the planet.¹² In addition to fulfilling important ecological and ecosystems functions, the Amazon's forests help stabilise the local and global climate as they store and filter excess carbon and other pollutants from the atmosphere and release oxygen. The Amazon is also a source of food and natural resources that support the livelihoods for many local communities. Around 60 percent of the Amazon rainforest is in Brazil,¹³ which is the focus of this report.

Industrial mining is a significant driver of deforestation in tropical regions, including the Amazon. In Brazil's Amazon, mining caused 11,670 km² of deforestation between 2005 and 2015,¹⁴ which represents around 9% of total Amazon forest loss during that period.¹⁵ According to data by MapBiomas, a collaborative initiative by NGOs, universities and tech companies in Brazil, 72.4% of Brazil's total mining area was located in the Amazon in 2020, showing an upward trend in recent years.¹⁶ A forthcoming Christian Aid report on climate change, rights and mining in the Brazilian Amazon will examine the impacts on deforestation in Brazil's Amazon of industrial mining as well as artisanal and small-scale mining.¹⁷ Industrial mining has also had widespread human rights and environmental impacts on local communities in Brazil's Amazon, notably indigenous, Quilombola and riverine communities, which have been custodians of the forests for centuries. Brazil's Quilombola communities originate from the mid-16th century, when groups of Africans and Afro-descendants escaped from slavery and joined together in close-knit communities to resist recapture, occupying hard-to-reach lands outside plantations.¹⁸ Brazil's Amazonian riverine communities have various origins, the most common being indigenous, Quilombola and descendants of migrants from the Northeast, fleeing severe droughts or attracted to the region in previous generations to work in farms, to chestnut gathering and, to a lesser extent, in extractive activities related to rubber tapping.¹⁹ Deforestation induced by mining has affected access to food and natural resources that support livelihoods for these marginalised communities. Mining operations have also restricted access to drinking water for local communities, polluted watercourses and have led to the occurrence of new diseases.

Industrial mining has had widespread human rights and environmental impacts on local communities in Brazil's Amazon, notably indigenous, Quilombola and riverine communities.

To contribute to bringing about transformative change in the industrial mining industry operating in Brazil's Amazon, this report seeks to document underlying economic policies by the government that incentivize it and corporate practices that keep this industry in place to continue operating in ways that are harmful to local communities and the environment. Specifically, it seeks to document how state tax policies enable large mining companies and aluminium producers to continue to make large profits and increase their wealth and power, while local communities are further impoverished and disempowered and the Amazon rainforest is significantly degraded. It also documents how short-term profit maximisation by large aluminium producers and mining companies is a key driver of the unsustainable exploitation of the Brazilian Amazon and its people by industrial bauxite mining. This report establishes the magnitude of the problems these state policies and corporate practices create and who benefits from them, on which little research has been conducted. To do this, this report examines, among other things, the cumulative exemptions that Brazil's tax policies grant to bauxite mining companies and in general, across the aluminium value chain operating in the Amazon; the immediate effects of these exemptions on State capacity to provide critical public services, as well as their aggregate effects.

We analyse the aluminium value chain in Brazil's Amazon, with a particular focus on the operations of *Mineração Rio do Norte* (MRN), a bauxite mining company, as a case study of a typical mining company operating in the region. Bauxite is the raw material used to produce primary aluminium, meaning from raw materials. Bauxite mining is significant in this region. In 2020, MRN, Hydro Paragominas and Juruti, which are the three bauxite mining companies operating in Brazil's Amazon, extracted 27.65 million metric tons of Bauxite²⁰ and Brazil is the world's fourth bauxite producer. MRN alone would qualify as the world's 7th largest bauxite source if it were a country based on data on bauxite mine production for 2020 and 2021.²¹ As the biggest bauxite miner in Brazil,²² MRN serves as an emblematic case of the detrimental impacts of industrial mining in the Brazilian Amazon. In more than four decades of production in Oriximiná, in the state of Pará, MRN increased its extraction rate from 620 thousand tons in 1979 to 18.2 million tons in 2016, having extracted almost 450 million tons of bauxite by 2019,²³ with devastating impacts on the environment and people of Oriximiná, especially for Quilombola and riverine communities.

Below: Map of Brazil, locating Pará and the municipality of Oriximiná. Source: El País.



Mapa del estado del Pará, donde están las ciudades de Cachoeira Porteira, Oriximiná y Óbidos. Portado Trombetas es el distrito industrial de Oriximiná, donde queda la sede de la Minera Rio do Norte.
INFOGRAFIA (EL PAÍS)

2. Brazil's significant cumulative tax exemptions

Industrial mining companies operating in Brazil's Amazon receive large cumulative tax exemptions. The principal tax exemptions that are relevant to industrial mining companies operating in Brazil's Amazon include a general exemption of *Imposto sobre as operações relativas à circulação de mercadorias e sobre prestação de serviços de transporte interestadual, intermunicipal e de comunicação* (ICMS) on goods intended for export.²⁴ The ICMS is an indirect value-added tax charged by Brazilian states on the sale of goods, freight, and certain services.²⁵ ICMS tax rates vary in each state ranging from 17% to 35%.²⁶ Special rates apply on interstate sales. The ICMS is the main tax collected by states, historically representing more than 80% of the total taxes collected.²⁷ As part of the ICMS is shared with municipalities (that make up the states), it is also an important source of income for them. The ICMS exemption on goods intended for export is very significant for the mining sector in Brazil, because more than 32% of Brazil's extracted minerals were exported in recent years.²⁸

Goods intended for export are also exempted from *Contribuição para Financiamento da Seguridade Social* (COFINS) and *Programas de Integração Social e de formação do patrimônio do servidor público* (PIS/PASEP),²⁹ which are two social contribution taxes charged on gross income of companies. COFINS is charged in most cases at the rate of 7.6%, while PIS is charged at the rate of 1.65%. COFINS is described as a social contribution and is targeted to finance social welfare programs. The PIS was created to fund Brazil's unemployment insurance program.

Goods intended for export also enjoy reduced import tax rates on capital goods used in mining that meet certain specifications. This reduction, known as *ex-tarifário*, is a government measure that temporarily decreases the import tariff on machinery and equipment without national production, including those used in the mining sector, and seeks to reduce the cost of investment for companies.

Finally, dividends, or company profits, received by Brazilian individuals and entities from Brazilian companies as shareholders are not included in taxable income since 1995.³⁰

Additional tax exemptions are granted to companies that operate in the so-called Brazil's *Legal Amazon*, a designated region comprised of the partial integration of the nine Brazilian states located in the Amazon region.³¹ Within this area, specific

laws were created since the 1960s to encourage extractivism in the Brazilian Amazon and many are still in effect. The main one grants a tax waiver of 75% on *Imposto de Renda sobre as Pessoas Jurídicas* (IRPJ), a corporate income tax, to large companies operating in the region. This tax exemption was established by the military government in 1963 by Law No. 4,216³² and was extended more recently until 2023 by Law No. 13,799 from the 3rd January 2019.³³

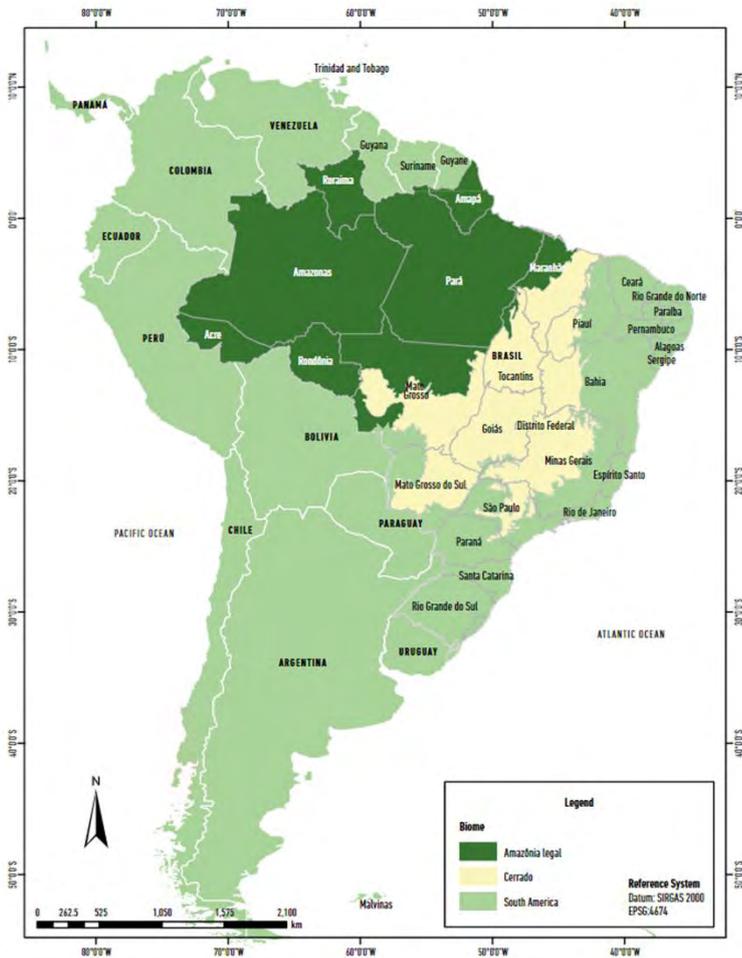
Furthermore, out of the remaining 25% of this tax, 30% can be used for reinvestment in the company itself through what is called the *Benefício Fiscal do Reinvestimento*, or the Reinvestment Tax Benefit. This tax benefit applies to companies operating in Brazil's Legal Amazon in certain sectors, including mining, to buy new machinery and equipment that are part of the productive process.³⁴ This tax benefit was also extended until 31 December 2023 by Law No. 13,799 from the 3rd January 2019.³⁵ The combined effect of just these two benefits means that the actual IRPJ tax exemption for mining companies can reach up to 82.5% in practice.

All these exemptions are cumulative. These tax exemptions granted by Brazil's tax policies to industrial mining companies operating in the Amazon increase the profits of these companies, while reducing the federal and state fiscal capacity to deliver public services and realise other human rights for communities in the Amazon. By increasing the profits of mining companies, these exemptions significantly incentivise the mining companies operating in this region to continue operations and thus perpetuate the unsustainable exploitation of Brazil's Amazon by this sector.

By increasing the profits of mining companies operating in the Amazon, tax exemptions significantly incentivise these companies to continue operations and thus perpetuate the unsustainable exploitation of Brazil's Amazon by this sector.

14 Profit before people and planet: How economic policies and corporate profit maximisation perpetuate the unsustainable exploitation of the Brazilian Amazon and its people

Below: Map of South America showing Brazil's *Legal Amazon* [Amazonia Legal] as of 2017. Source: Prepared by João Vitor Zebende; IBGE 2018. It is included in Franco da Silva, Carlos Alberto, & Bampi, Aumeri Carlos (2019).³⁶



Brazil's tax policies also grant these tax exemptions to the other two levels of the aluminium value chain, alumina and aluminium production, operating in the Amazon. This significantly magnifies the economic and social costs of these exemptions. We will illustrate the effects of these policy decisions by analysing the tax exemptions that Norsk Hydro and Alcoa, two large international aluminium producers, have received, and continue receiving, at various levels of this value chain. We will also demonstrate that there is a particular lack of transparency on approvals and tax exemption amounts provided in Brazil's Legal Amazon, specifically to the region covered by what is called *Superintendência do Desenvolvimento da Amazônia* - SUDAM (the Superintendency for Development of the Amazon Region).³⁷ This lack of accountability and transparency hinders a full evaluation of these exemptions by stakeholders and the public, including their socioeconomic costs and whether they contribute to achieving their purported objectives.³⁸

Brazil's tax policies also grant large tax exemptions to the other two levels of the aluminium value chain, alumina and aluminium production, operating in the Amazon. This significantly magnifies the economic and social costs of these exemptions.

3. High vertical ownership concentration across the aluminium value chain in Brazil

The production of primary aluminium, meaning from raw materials,³⁹ involves three main stages: The first level is bauxite mining. Next, alumina is extracted from bauxite in a refinery. Lastly, alumina is used to produce primary aluminium. Bauxite mining is nearly entirely undertaken to produce primary aluminium.⁴⁰ A notable feature of the aluminium value chain in Brazil is a high degree of vertical ownership concentration, with only a few large international aluminium producers and mining companies having significant shareholdings in companies across the three levels of the value chain and thus, controlling a very significant proportion of the Brazilian production across the three levels. These few large international companies are Norsk Hydro,⁴¹ Alcoa and South32. For example, Norsk Hydro, a company controlled by the Norwegian government,⁴² owns the totality of the Hydro Paragominas bauxite mine, located in northeast Pará in Brazil's Amazon,⁴³ that produces 11.4 million tons of bauxite annually.⁴⁴ Norsk Hydro also has a 5% ownership interest in MRN, but it has agreements with Vale that guarantee it a further 40% of the volume of MRN's bauxite production.⁴⁵ It also owns a 92% share of Alunorte,⁴⁶ the world's largest alumina refinery outside China,⁴⁷ located in the city of Barcarena, state of Pará, and a 51% share of Albras,⁴⁸ the largest producer of primary aluminium in Brazil, also located in Barcarena.⁴⁹ According to data from the Brazilian Aluminium Association, a business association, in 2020 Norsk Hydro held, through its subsidiary Norsk Hydro Brasil, 53.7% of the total alumina production in Brazil.⁵⁰

Alcoa, a large international aluminium producer headquartered in the U.S., owns 100% of the shares of the Juruti bauxite mine, also located in Pará, in Brazil's Amazon rainforest.⁵¹ It also owns 54% of shares of Alumar's alumina refinery, located in the rural area of São Luís, state of Maranhão, in the north-east of Brazil. Up until May 2022, it also held 18.2% of MRN's shares. According to the Brazilian Aluminium Association, in 2020 Alcoa held 21.5% of total alumina production in Brazil.⁵²

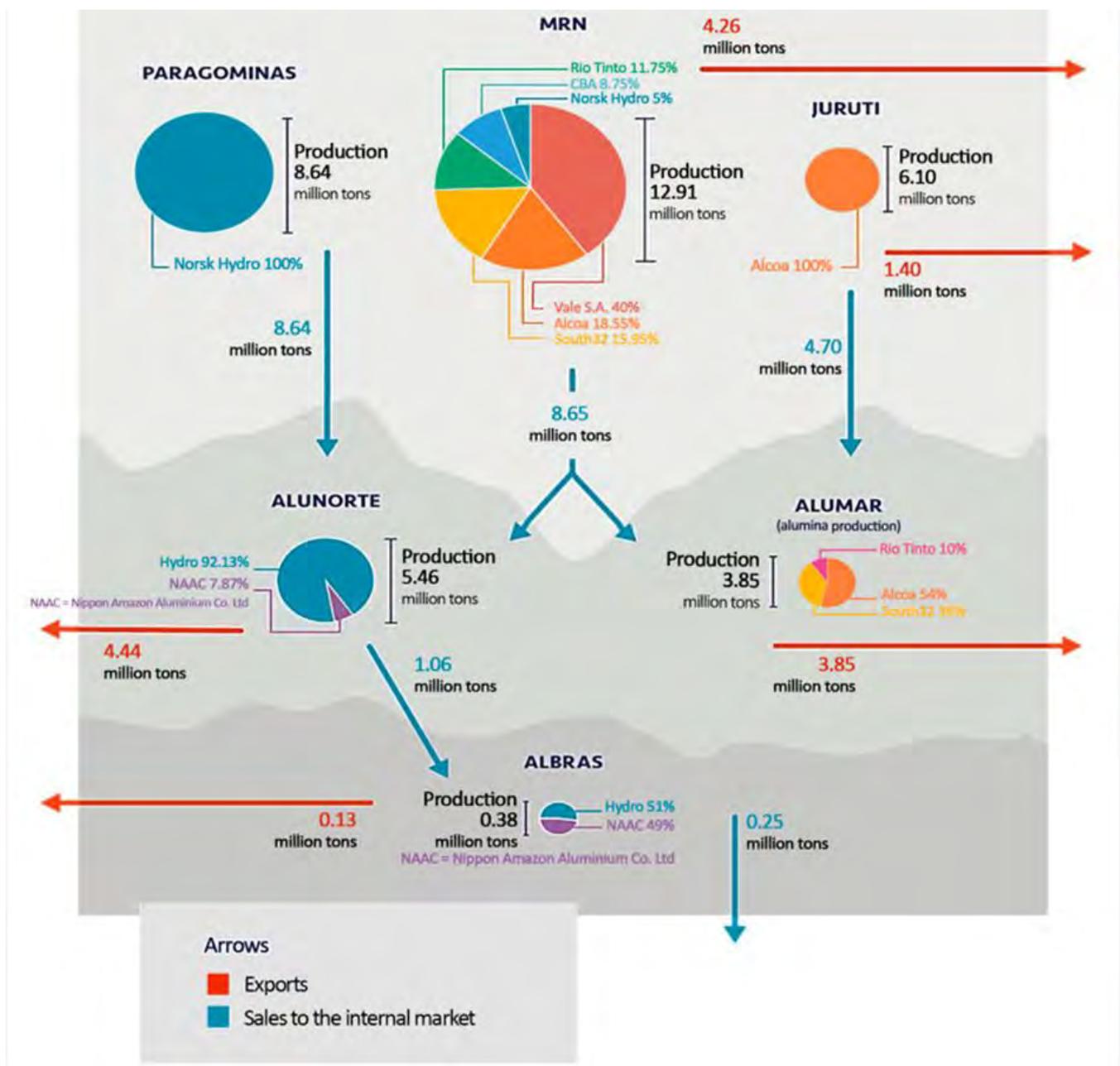
South32, a large mining company headquartered in Australia and established in 2015 resulting from BHP Billiton's demerger,⁵³ owns 33% of MRN's shares⁵⁴ and 36% of shares of Alumar's alumina refinery. All of these companies in the

A notable feature of the aluminium value chain in Brazil is a high degree of vertical ownership concentration, with only a few large international aluminium producers and mining companies having significant shareholdings in companies across the three levels of the value chain and thus, controlling a very significant proportion of the Brazilian production across the three levels.

16 Profit before people and planet: How economic policies and corporate profit maximisation perpetuate the unsustainable exploitation of the Brazilian Amazon and its people

aluminium value chain in the north of Brazil are located in Brazil's Legal Amazon.

Chart 1: High vertical ownership concentration across the aluminium value chain in Brazil's legal Amazon and sales' destinations based on data for 2020.



This is a replication of the graph designed by Cardoso, 2019, p. 37. Shareholdings by a same company are shown by using the same colour in the pie charts. **Sources:** Annual reports from Albras, Alcoa, Alunorte, MRN, Norsk Hydro, and Hydro Paragominas; SISCOMEX - Sistema Integrado de Comércio Exterior - SECEX/Ministério da Economia; Alcoa, A Alumar bate recorde de produção de alumina desde a implantação do Consórcio, 18 January 2021.⁵⁵

This diagram shows that international aluminium producers and mining companies, namely Norsk Hydro, Alcoa and South32, have significant shareholdings in the three bauxite mining companies operating in Brazil's Amazon, namely MRN, Hydro Paragominas and Juruti. Moreover, the last two are controlled by Norsk Hydro and Alcoa respectively. These elements are particularly relevant for our inquiry into the degree of influence that large aluminium producers and mining companies have on MRN's operations and the responsibilities arising from this, discussed further down in this report.

As mentioned above, Brazil's tax policies grant tax exemptions that are cumulative and apply to all levels of the aluminium value chain in Brazil. These tax exemption's characteristics and the high vertical ownership concentration that exists in this value chain multiply the benefits to companies resulting from these exemptions. We will exemplify the effects of these two elements by examining the tax exemptions that Norsk Hydro and Alcoa have received, and continue receiving, at different levels of this value chain.

4. MRN as a case study

Mineração Rio do Norte (MRN) is a privately held corporation⁵⁶ specialised in the extraction, processing and sale of bauxite, with main operations in the municipality of Oriximiná, in Brazil's Amazon. In this municipality, MRN mines several of the plateaus of the Trombetas basin.⁵⁷ MRN's mining operations began there in 1979, but there was a major expansion of the mine in 2003.⁵⁸ MRN has extracted almost 450 million tons of bauxite by 2019.⁵⁹ Since 2015, MRN has been responsible for between 39% and 48% of the total annual sales of bauxite production in Brazil.⁶⁰ This exploration and extraction has caused the deforestation of extensive areas of tropical forest and serious socioenvironmental impacts on Quilombola and riverine communities. Given MRN's significant role in bauxite mining in the Brazilian Amazon and its far-reaching impacts on people and the planet, this research delves more deeply into the economic policies and corporate practices that enable MRN and its shareholders, as typical of the sector, to continue to profit off of these activities.

Given MRN's significant role in bauxite mining in the Brazilian Amazon and its far-reaching impacts on people and the planet, this research delves more deeply into the economic policies and corporate practices that enable MRN and its shareholders, as typical of the sector, to continue to profit off of these activities.

4.1. Social and environmental impacts of MRN's operations

Research conducted by Brazilian civil society organisations and researchers with affected local communities demonstrates that MRN's mining operations in Oriximiná, which started in 1979, have caused the deforestation of extensive areas of tropical forest and serious socioenvironmental impacts on Quilombola and riverine communities.⁶¹ The communities most directly affected by MRN's mining in Oriximiná include 811 Quilombola families and 289 families of riverine communities, made up of an estimated 6,490 and 1,735 people respectively, according to data by *Comissão Pró-Índio de São Paulo* from 2022.

While transforming raw bauxite into aluminium is incredibly energy intensive and releases a range of greenhouse gasses, as will be discussed below, many of the more direct socioenvironmental impacts of MRN's operations in Oriximiná stem from the deforestation of extensive areas of tropical forests. Not only do these forests fulfil important ecological functions, they are a critical source of food and livelihoods of many Quilombola and riverine families. To better understand the magnitude of the human rights and environmental impacts of MRN's operations, it is first worth describing the environmental impacts of the type of large-scale mining operations MRN conducts as demonstrated by scientific studies

Research conducted by Brazilian civil society organisations and researchers demonstrates that MRN's mining operations in Oriximiná have caused the deforestation of extensive areas of tropical forest and serious socioenvironmental impacts on Quilombola and riverine communities.

such as the one by Rocha-Martins *et al.* from 2020, which states:

*"Mining currently figures as one of most destructive economic activities over natural ecosystems. It brings various negative impacts to the environment, which starts with the complete removal of the local native vegetation and consequent wildlife disappearance. Following this, the topographic disassembling is done when finally the ore mining starts, which usually results in strong hydro-biogeochemical changes in the ecosystem."*⁶²

In the specific case of bauxite extraction by MRN in Oriximiná, the ore area is at an average depth of eight meters.⁶³ Therefore, in addition to the complete removal of the local native vegetation,⁶⁴ bauxite extraction includes topographic disassembling to reach this depth. This consists of dismantling "the configuration of a surface including its relief and the position of its natural and man-made features,"⁶⁵ resulting in a long-term loss of habitat and food for local wildlife, as well as significant soil erosion. As Rocha Martins *et al.* (2020) note, ore mining frequently "results in strong hydro-biogeochemical changes in the ecosystem." All these effects are very significant in the case of MRN because, as mentioned above, in Oriximiná MRN mines several plateaus of the Trombetas basin.

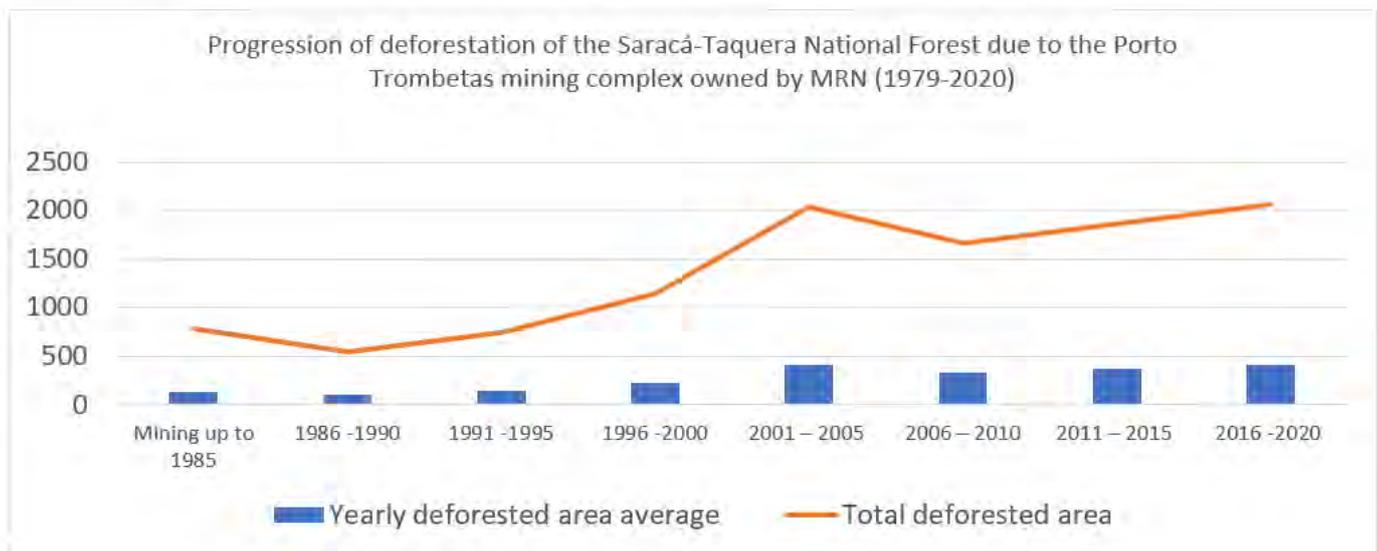
Below: Some of the area deforested by MRN in Oriximiná. Picture taken in 2016.
Source: Carlos Penteadó.



As reported by Wanderley, the acceleration of mineral extraction over time by MRN increased the speed of deforestation within the Saracá-Taquera National Forest in which MRN operates.⁶⁶ According to the same researcher, the annual deforestation rate, which was 109.9 hectares between 1986 and 1990, almost quadrupled between 2016 and 2020, reaching 413.35 hectares per year.⁶⁷ According to the same source, the total loss of national forest area is in the order of 10.8 thousand hectares over 41 years.⁶⁸ It is worth mentioning that according to scientific studies, in addition to the deforestation within mining lease boundaries, mining operations open up the forests to a range of activities that lead to deforestation.⁶⁹ Pathways leading to the latter include mining infrastructure establishment, urban expansion to support a growing workforce, and development of mineral commodity supply chains.⁷⁰ Researchers have documented this worrying phenomenon in the Brazilian Amazon.⁷¹

The acceleration of mineral extraction over time by MRN also progressively increased the speed of deforestation within the Saracá-Taquera National Forest in which MRN operates.

Chart 2: Progression of deforestation of the Saracá-Taquera National Forest due to the Porto Trombetas mining complex by MRN (1979-2020), data table included in Annex. Source: Wanderley, 2021.⁷²



Deforestation leads to loss of economic activities that are linked to forests, including gathering for sale of nuts and fruit, while also leading to loss dwelling space for people to live in communities where forests provide for their preferred location to live and exercise their economic livelihoods. For example, as highlighted by Brazilian civil society organizations, in the early 2000s, with mining by MRN in the Aviso, Bacaba and Almeidas plateaus, the riverine communities of Boa Nova and Saracá had harvesting areas of Brazil nuts deforested by MRN.⁷³ These nuts were an important source of income at the time for these

communities. As highlighted by Golder Associates Brasil in a 2022 report, people from the Boa Vista Quilombo, which live next to MRN's village, have also reported significant impacts on their access and use of forest resources due to MRN operations.⁷⁴

Brazilian researchers have also documented that bauxite mining by MRN has also had significant impacts on water quality and quantity for local communities, because a significant amount of water is required for the operations of bauxite mining, mostly for washing and extracting the ore.⁷⁵ For example, as highlighted by a report by *Comissão Pró-Índio de São Paulo*, people from the riverine communities of Boa Nova and Saracá report serious impacts on watercourses due to MRN's operations, such as changes of watercourses' colour and the lowering of water levels of *igarapés*, which are small bodies of water, hindering their access to quality water, generating diseases and impacting on fishing activity.⁷⁶ As informed by Golder Associates Brasil in a 2022 report, people from the Boa Vista Quilombo have also reported significant impacts on water quality and quantity caused by MRN operations.⁷⁷ In addition, removal of topsoil creates a lot of dust and residues that end up in water bodies, reducing water quality. For example, as highlighted by Golder Associates Brasil, Quilombola communities in Alto Trombetas 2 have reported presence of waste slurry in *igarapés* in the region located in areas where the soil has no vegetation cover.⁷⁸ Quilombola communities in Alto Trombetas 2 have considered actions by MRN to address these impacts such as installing filters and monitoring as insufficient.⁷⁹ As highlighted by Golder Associates Brasil in a 2022 report, local communities also associate the alterations caused by mining and MRN Porto Trombetas port on watercourses with a significant decrease in fish, which is a very important component of the food sovereignty of these communities.⁸⁰

Bauxite mining by MRN has also had significant impacts on water quality and quantity for local communities, because a significant amount of water is required for the operations of bauxite mining, mostly for washing and extracting the ore.

22 Profit before people and planet: How economic policies and corporate profit maximisation perpetuate the unsustainable exploitation of the Brazilian Amazon and its people

Below: Water with the colour of bauxite comes out of the water well in the Boa Nova riverine community. Picture: Carlos Pentead.



Similarly, the Boa Vista Quilombo report that the installation of the village, the industrial area and the port of MRN led to an embankment of the watercourses that they had used for generations, especially for transportation and access to fishing grounds and chestnut groves.⁸¹ For these communities, rivers, lakes and streams are a source of water for drinking, cooking and personal hygiene. While MRN has denied the impacts reported, no independent studies have been conducted to assess the impacts of its activities on watercourses.

A forthcoming Christian Aid's report on climate change, rights and mining in the Brazilian Amazon documents that communities in Oriximiná consulted about the environmental impacts of mining in their territories also mentioned how the loss of forests and biodiversity contributed to a loss of local/indigenous knowledge which also makes it harder for people to survive on their land and makes them more dependant on the mining companies.⁸²

Some of the territories of Quilombola and riverine communities overlap with federally protected areas (those covered by the Saracá-Taquera National Forest).⁸³ Since 2017, the Brazilian government has been conducting procedures to ensure the regularisation of these Quilombola territories. As a result, in 2018 the government published a recognition ordinance of the two territories.⁸⁴ All the areas for ore extraction covered by the concessions granted to MRN, which cover 123,757.12 hectares of native forests,⁸⁵ are located within this protected area. Brazilian civil society organizations have also documented that in several instances, Brazil's government has granted MRN an

environmental license for mining exploration in territories that overlap with lands of Quilombola and riverine communities without obtaining free, prior and informed consent (FPIC),⁸⁶ a principle protected by international human rights standards to protect the rights of indigenous populations to self-determination. In many of these cases, participatory, meaningful and comprehensive consultations were not conducted. According to *Comissão Pró-Índio de São Paulo*, this was the case in the licensing of the Monte Branco plateau in 2013, which partially overlaps with the Quilombola land of Alto Trombetas 2, for which the government only requested evaluations and a consultation for the renewal of the license in 2017, which currently is ongoing.⁸⁷ According to the same source, this was also the case in the licensing of the Aramã plateau in 2018. In that case, the forest used by the riverine communities of São Francisco, São Tomé, Espírito Santo and São Sebastião was licensed, no consultation was conducted nor any previous dialogue with the riverine communities before the license's approval or the start of the mineral exploration was held.⁸⁸

Given the breadth and scale of the adverse social and environmental impacts of MRN's mining operations, if not adequately addressed, they will contribute to a 'vicious cycle' of poor health, poverty and disempowerment. While MRN has stated in a 2020 sustainability report that it "is committed to ensuring that necessary corrective measures [to address negative impacts to local communities] are implemented,"⁸⁹ as highlighted by Golder Associates Brasil in a 2022 report, local communities have indicated that effective measures in this regard have yet to be delivered by MRN.⁹⁰ As has been called for by local communities, at a minimum, MRN should adopt measures to mitigate the harmful social and environmental impacts of their operations. While taking immediate actions to address most serious impacts, it should consult local communities for the design of these and other measures. Actions that would be particularly important for MRN to take include the provision of clean water and health services to local communities, measures to cut down pollution and other impacts on watercourses, and the application of more resources to ecosystems restoration. MRN should also take effective measures to responsibly phase out mining operations in this region over the medium to long term, given the magnitude of the environmental, climate and social impacts of its mining operations. In doing so it should conduct consultations with affected local communities.

While MRN has stated in a 2020 sustainability report that it "is committed to ensuring that necessary corrective measures [to address negative impacts to local communities] are implemented," local communities have indicated that effective measures in this regard have yet to be delivered.

Yet, MRN is not solely responsible for the harm being done by its mining operations to the Brazilian Amazon and its peoples. The remainder of this report reveals that underlying public policies and corporate practices perpetuate MRN's operations and demonstrates that the Brazilian government, as well as MRN's shareholders and main buyers share responsibility in this regard.

The remainder of this report reveals that underlying public economic policies and corporate practices perpetuate MRN's operations and demonstrates that the Brazilian government, as well as MRN's shareholders and main buyers share responsibility in this regard.

4.2. Tax exemptions received by MRN

MRN's annual reports show that it has received significant cumulative tax exemptions during the last ten years. These include a tax waiver of 75% of the IRPJ, a corporate income tax, for operating in the Brazilian Amazon. One way to estimate the loss to the public purse is to estimate the tax that would be paid on the operating profit without the tax exemption which is called "Lucro da Exploração" in Brazilian legislation.⁹¹ As the following table shows, the total amount of the tax exemption of 75% of the IRPJ that MRN has received for the last 10 years is Brazilian Reals 270,830,000, amounting to over USD \$75 million (USD 76,563,018).

Table 1: Quantifying the tax exemption of 75% of the IRPJ received by MRN from 2012 to 2021.

Year	Tax exemption to IRPJ in BRL	Tax exemption to IRPJ in USD
2012	875,000	428,186.93
2013	489,000	208,742.42
2014	11,961,000	4,503,049.47
2015	82,258,000	21,065,867.65
2016	89,661,000	27,510,969.29
2017	24,436,000	7,386,940.75
2018	28,872,000	7,451,223.28
2019	32,278,000	8,008,038.31
2020	-	-
2021	-	-
Total	270,830,000	76,563,018.10

Methodology: The source for the yearly amount of the tax exemption to IRPJ for years 2012 to 2021 received by MRN was sourced from MRN's annual reports. To convert the yearly amount of this tax exemption from Brazilian Reals to USD, we used the official exchange rate on 31 December of the given year provided by the Brazilian Central Bank, available at [Currency Conversion](#). We put a hyphen for the tax exemption to IRPJ for 2020 and 2021 because there is a loss reported for 2020 and 2021 in MRN's annual accounts.

This tax exemption was renewed in 2014 for ten years, so it continues to be applicable until 2023.⁹² While, arguably, MRN would not have continued its operations without this considerable tax exemption, the government of Brazil could have chosen to eliminate these exemptions and collect this tax instead. In that sense, the amount MRN received over the last ten years — USD 76,563,018 — could have provided valuable resources to deliver public services such as health, education and clean water to communities in Oriximiná and other parts of Pará and more fundamentally, could have supported investment in more sustainable industries, which would have also generated jobs and other additional forms of income to the state. To illustrate the significance of this amount lost to the public purse, the total revenue from taxes, fees and charges forecasted in the Oriximiná municipality's budget for 2021 was Brazilian Reals 36,880,350⁹³ which amounts to over USD \$7m (USD 7,096,879).⁹⁴ This means that, taken over the previous ten-year timespan, the value of just one tax exemption received by MRN amounts to more than what the entire Oriximiná's municipality approximately generated in taxes, fees and charges.

Taken over the previous ten-year timespan, the value of just one tax exemption received by MRN, that of 75% of the IRPJ, amounts to more than what the entire Oriximiná's municipality approximately generated in taxes, fees and charges.

In its 2021 annual report, MRN also acknowledged that it receives the "Benefício do Reinvestimento,"⁹⁵ another tax deduction that also applies to companies operating in Brazil's Amazon, specifically to a region covered by the SUDAM regional development authority for the Amazon,⁹⁶ to buy new machinery and equipment that are part of the productive process. With these two tax benefits, the total tax exemption can reach up to 82.5% of the IRPJ due. The tax exemptions for ICMS, COFINS and PIS/PASEP on goods intended for export are also very substantial for MRN because from 2012 to 2021, MRN's annual bauxite exports have ranged between 33% and 52% of MRN's total annual sales in terms of metric tons, and for eight out of these ten years, MRN's exports have amounted to 41% or more of MRN's total annual sales, as demonstrated in Table 2.

Table 2: Destination of bauxite sales by MRN from 2011 to 2021 (in millions of metric tons).

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Sales to internal market	9,971	8,840	9,612	8,820	8,700	9,454	7,608	7,062	8,653	7,992
Total exports	6,929	8,160	8,188	9,180	9,388	7,279	7,194	5,114	4,262	4,495
Total sales	16,900	17,000	17,800	18,000	18,088	16,734	14,802	12,177	12,916	12,487
Exports as percentage of total sales	41%	48%	46%	51%	52%	43.5%	49%	42%	33%	36%

Source: MRN's annual reports.

Not all data to calculate MRN's effective tax rate is available. Because of this, we are using MRN's revenue and how much MRN has paid on taxes, fees and charges from 2015 to 2020 to get an indication in this regard. MRN has disclosed the latter in its annual reports, presented here in Table 3, disaggregated by tax, fee or charge.

Table 3: Taxes, fees and charges paid by MRN from 2015 to 2020 in Brazilian Reals millions.

Year	2015	2016	2017	2018	2019	2020
ICMS	20.2	9.8	32.8	17.2	19.9	29.9
CFEM	42.1	44.4	33.1	46.3	54.3	54.7
PIS and COFINS	8.6	20.9	20.8	23.4	11.8	41.2
IRPJ	46.2	86.8	18.4	54.7	66.5	45.5
Contribuições previdenciárias	45.6	48.1	49.8	54.4	48.3	58.2
TFRM	24.8	27	26.2	23.6	21.9	22.8
TFRH	6.7	11.8	11.2	14.7	11.4	8.6
Other taxes, fees and charges	4	4	6.4	2.5	2.4	5.1
Total	198.2	252.8	198.7	236.8	236.5	266

Source: MRN's annual reports.

Based on data on how much MRN has paid in total in taxes, fees and charges from 2015 to 2020, one can calculate the percentage of how much of MRN's revenues are paid in taxes, fees and charges per year (Table 4).

Table 4: Percentage of annual MRN revenues paid in taxes, fees and charges from 2015 to 2020 in Brazilian Reals millions.

Year	2015	2016	2017	2018	2019	2020
MRN revenue ("receitas" in MRN's annual reports)	1,687.0	1,509.4	1,318.5	1,729.4	1,639.0	1,872.3
Total paid by MRN on taxes, fees and charges	198.2	252.8	198.7	236.8	236.5	266
% of MRN revenues paid in taxes, fees and charges	11.7%	16.7%	15.1%	13.7%	14.4%	14.2%

Source: MRN's annual reports.

The average percentage of MRN's revenues paid in taxes, fees and charges per year from 2015 to 2020 is 14,3%. This is not a standard 'effective tax rate' estimate since it is based on revenue and covers a range of taxes and other payments, namely fees and charges. The effective tax rate is lower than the figures showed in the table, because these figures encompass fees and charges in addition to taxes paid. We did not find sufficient public information to calculate what the main profit-based taxes amount to as a percentage of MRN's operating profit. Despite the lack of public data to calculate MRN's effective tax rate, our analysis suggests that the various cumulative tax exemptions MRN has received over the last few years result in a relatively low effective tax rate. The tax exemptions alone comprise hugely significant foregone revenue.

4.3. Main benefits received by MRN's shareholders

This subsection documents the main economic benefits that MRN's shareholders have received, and continue to receive, from MRN's operations. As a preliminary matter, we present MRN's shareholder composition.

As of 19 May 2022, MRN's shareholders are large aluminium producers and mining companies, namely:⁹⁷

- Vale: 40% (a Brazilian multinational enterprise (MNE), with operations in about thirty countries other than Brazil)⁹⁸
- South32: 33% (an Australian MNE)
- Rio Tinto: 12% (an Anglo-Australian MNE)
- CBA (Companhia Brasileira de Alumínio): 10% (Brazilian)
- Norsk Hydro: 5% (a Norwegian MNE)

Until 1 May 2022, Alcoa, a large international aluminium producer headquartered in the U.S., held 18.2% interest in MRN, but this was bought by South32 in May 2022.⁹⁹ While Norsk Hydro owns 5% of MRN's shares, it has agreements with Vale that guarantee it a further 40% of the volume of MRN's bauxite production.¹⁰⁰

As will be demonstrated below, getting large amounts of bauxite from MRN, a product that is produced at costs lower than those that would have been incurred absent existing major tax exemptions, has been one of the main benefits that shareholders have received from MRN over the last ten years. At the same time, MRN's shareholders have continued to make sizeable profits from their holdings in MRN, expressed as dividends that are distributed to shareholders every year. For the last ten years, MRN's shareholders received over USD 275 million in dividends from MRN (Table 5).

Table 5: Dividends distributed by MRN to its shareholders between 2013 to 2022.

Year	Amount in Brazilian Reals	Amount in USD
2022	0	0
2021	9,209,000	1,619,905.36
2020	111,635,000	21,302,763.15
2019	0	0
2018	53,115,000	15,980,203.38
2017	339,905,000	107,279,699.53
2016	278,433,000	78,235,690.80
2015	58,061,000	18,098,815.46
2014	30,442,000	13,452,054.79
2013	38,868,000	19,300,824.31
Total	919,668,000.00	275,269,956

Note: MRN's annual reports were the source for the dividends distributed by MRN to its shareholders in Brazilian Reals. The yearly amount of the dividends in Brazilian Reals was converted to USD using the official exchange rate of the first day of April in each analysed year.¹⁰¹

As mentioned, MRN's shareholders, or companies that they have significant control over, buy up nearly all of MRN's bauxite production. Analysis based on data disclosed in MRN's annual reports reveals that during the period 2012 to 2021, 99% of MRN's annual bauxite sales have been made to related parties (companies controlled by MRN's shareholders or companies in which its shareholders have a significant shareholding) (see Annex Tables A2 and A3 for data and methodology). This is highly significant because it demonstrates that one of the main reasons for MRN to exist is for its shareholders to get bauxite from it,¹⁰² a product that is produced at costs lower than those that would have been incurred absent existing major tax exemptions. This not only increases MRN's profits, but also the profits of companies further down in the aluminium value chain in Brazil. The high vertical ownership concentration that exists in this value chain and sales patterns allows MRN's shareholders to enjoy this increased profitability at various levels of this chain, benefiting from large cumulative tax exemptions.

As Table 6 shows a few MRN's shareholders received most of the bauxite mined by MRN in the last ten years.

Table 6: MRN bauxite production in metric tons received by each related party 2012-2021

Related party	Bauxite received (metric tons)
Alunorte - Alumina do Norte do Brasil S.A.	40,832,892.29
Hydro Aluminium International S.A.	28,766,712.80
Rio Tinto Alcan Inc.	19,946,635.94
South32 Minerals S.A.	19,902,432.81
Alcoa World Alumina LLC - A.W.A.	18,969,675.78
Alcan Alumina Ltda.	13,073,373.14
BHP Billiton Metais S.A.	6,889,187.61
Alcoa World Alumina Ltda.	2,096,620.83
BHP BMAG	2,092,989.79
<i>South32 Marketing PTE Ltd.</i>	1,247,701.62
Alcoa Alumínio S.A.	895,357.73
<i>Norsk Hydro Brasil Ltda.</i>	199,574.06
Vale International	13,505.66
Total	154,926,660.05

Source: MRN's annual reports.

Method: The annual amount of bauxite in metric tons that each MRN's related party has sourced from MRN from 2012 to 2021 was calculated by dividing the annual value of the bauxite purchases by each related party to MRN in Brazilian Reals, information included in MRN's annual reports, by the average annual price of a bauxite metric ton charged by MRN in its sales. The methodology used to calculate the latter is described below of table A3 included in the annex. See also table A3.

As discussed earlier, Norsk Hydro owns a 92% share of Alunorte. This means that between 2012 and 2021, Norsk Hydro alone purchased a total of 69,599,605 bauxite tons from MRN through its controlled companies, which is 44.92% of the total amount of metric tons of bauxite bought by related parties from MRN during the same period. In the third place of related parties that sourced most bauxite in metric tons from MRN from 2012 to 2021, we found Rio Tinto Alcan Inc. and in the fourth place, we found South32 Minerals S.A.

The finding that MRN's shareholders, or companies that they have significant control over, buy nearly all of MRN's bauxite production have two other important implications. Firstly, this finding means that MRN's international shareholders and main buyers are significantly benefiting from MRN's operations, which as will be discussed below, is an important basis for the responsibilities of these companies for MRN's human rights and environmental impacts. Secondly, this finding is highly concerning because it provides fertile ground for transfer pricing manipulation and other practices of tax avoidance.

Transfer pricing manipulation is "a technique used by multinational enterprises to shift profits out of the countries where they operate and avoid paying taxes that involves a multinational enterprise effectively selling itself goods and services through various corporate structures and entities at artificially high prices."¹⁰³ In this regard, it is notable that MRN has not disclosed all the criteria for price setting in its bauxite sales to related parties. In its 2021 annual report, MRN reports the following on quantity and price setting of its sales to related parties:

The quantities sold to each related party ... are confirmed annually ... The prices charged, in US dollars, are calculated according to formulas based on the base price of bauxite, technical quality of bauxite and other specificities established in a contract with the shareholders, and updated quarterly by the LME (London Metal Exchange).¹⁰⁴

In its response to a draft of this report, MRN also provided some additional information on the criteria for price setting criteria it uses in its bauxite sales, stating that “[its] contractual sales price is directly linked to price references of the two main subsequent products of the aluminium value chain, Alumina (through the Export Australian Bureau of Statistics) and Aluminium (through London Metal Exchange – LME).”¹⁰⁵ The inclusion of the expression “other specificities established in a contract” in its annual report makes it clear that MRN does not disclose all the criteria for price setting of its bauxite sales to related parties, which is not addressed by the additional information provided by MRN. MRN’s shareholders also fail to disclose all the criteria for price setting used in their bauxite purchases from MRN. For example, Hydro (2020) has stated that “bauxite purchases ... made under offtake agreements from MRN are based on prices *partly* linked to LME ([aluminium] prices and alumina market prices [emphasis added]),”¹⁰⁶ without further specifying. This lack of transparency on all the criteria for price setting in MRN’s bauxite sales to related parties creates an enabling environment for tax abuse to occur. This risk of potential tax abuse is further compounded by the fact that these sales have represented nearly all of MRN’s annual sales for the last ten years. In the absence of full transparency about company structures, transfer pricing and wider financial flows between companies within a group and payments to governments, it is difficult to ascertain the precise impact of the corporate structure on tax payments.

In conclusion, MRN and its shareholders benefit from their relationships in several ways. They are able to ensure a continuous supply of bauxite (product that is produced at costs lower than those that would have been incurred absent existing major tax exemptions) to companies operating further down in the supply chain, while maximizing on MRN’s ability to benefit from tax exemptions to increase profits. At the same time, the resources from the multiple tax exemptions that MRN has received over the last ten years have also been reinvested in the company, allowing shareholders to increase MRN’s capacity to extract bauxite without having to invest their own resources.

The opacity of the sales transactions between MRN’s and its shareholders is particularly dangerous in highly vertically integrated value chains such as that of aluminium in Brazil.¹⁰⁷ Two large international aluminium producers, namely Norsk Hydro and Alcoa, or companies controlled by them, also buy nearly all bauxite production from the other two bauxite mines operating in Brazil’s Amazon, Hydro Paragominas and Juruti. Norsk Hydro’s annual reports suggest that Alunorte, an alumina

In conclusion, MRN and its shareholders benefit from their relationships in several ways.

refinery controlled by Norsk Hydro, has received all bauxite mined by Hydro Paragominas, which is 100% owned by Norsk Hydro, at least for the last four years.¹⁰⁸ Meanwhile, Alcoa owns 100% of the shares of Juruti and in 2020, bought 100% of the latter's bauxite production. These company structures and sales patterns indicate that the risk of transfer pricing manipulation goes well beyond MRN's operations.

4.4. Tax exemptions across the aluminium value chain

In addition to the various benefits that large international aluminium producers and mining companies receive from MRN operations, these companies also enjoy tax exemptions in relation to the operations of other bauxite mining companies operating in Brazil's Amazon and from producing alumina and aluminium.

For example, as indicated above Norsk Hydro controls Hydro Paragominas, a bauxite mine, Alunorte, an alumina refinery, and Albras, an aluminium producer, all of which operate in Brazil's Amazon. Norsk Hydro disclosed that these three companies have received significant exemptions on corporate income tax, "reducing the tax rate on operating income to between 20 and 34 percent up to 2017,"¹⁰⁹ down from the nominal corporate income tax of 34%.¹¹⁰ The most significant of these tax exemptions is the above-described tax waiver of 75% of IRPJ to companies that operate in Brazil's Amazon, specifically in SUDAM.¹¹¹ Norsk Hydro added that, while "no tax incentives have been valid or applicable for the years 2018, 2019 and 2020[,] in 2021, Hydro Paragominas has been granted renewal of a SUDAM income tax incentive for a 10-year period, reducing the tax rate on operating income to between 20 and 34 percent from 2020 to 2029,"¹¹² down from the nominal corporate income tax of 34%.¹¹³ Norsk Hydro also benefits from a 15-year deferral of ICMS, an indirect tax, granted in 2015.¹¹⁴ While, in its response to this report, Norsk Hydro claimed this is a deferral of tax credits, in its 2020 annual report, it noted that a "discontinued ICMS deferral [, a proposal by Pará policymakers,] ... may cause material negative effect on Hydro's profitability",¹¹⁵ and recognised it as one of the company's operational risks.¹¹⁶ This demonstrates the significance of the 15-year ICMS deferral that Hydro currently enjoys.¹¹⁷

Similarly, Alcoa reports that its controlled companies operating in bauxite mining and alumina refinery in the Brazilian Amazon — i.e., Juruti and Alumar, respectively — have received a significant tax exemption on corporate income tax, "which [has]

decrease[d] the tax rate on [the covered] income from 34% to 15.25%.”¹¹⁸ Alcoa adds that this tax exemption on corporate income “related to production at the Alumar refinery will end on December 31, 2027, and the [tax exemption on corporate income] related to the operation of the Juruti bauxite mine will end on December 31, 2026.”¹¹⁹

Table 7 lists other mining companies and projects that have received a tax waiver of 75% of IRPJ between 2007 and 2017 for operating in Brazil’s Amazon, specifically in the SUDAM.

Table 7: Mining companies and projects receiving a 75% IRPJ tax waiver, 2007-2017.

COMPANY/PROJECT	Municipality	Activity/Product
Norsk Hydro/Bauxita Paragominas	Paragominas, Pará	Bauxite
VALE Manganês S/A	Parauapebas, Pará	Manganese
VALE S.A./ Serra do Sossego	Canaã dos Carajás, Pará	Copper, lead, zinc
VALE S.A/ Onça Puma	Ourilândia do Norte, Pará	Nickel
VALE S.A/S11D	Canaã dos Carajás, Pará	Iron ore
VALE S.A/ Cristalino	Curionópolis, Pará	Copper, lead, zinc
VALE S.A/ Complexo Carajás	Paraupebas, Pará	Iron ore
VALE S.A/ Estrada de Ferro Carajás	Marabá, Pará	Freight transport
VALE S.A/ Área Operacional de Pelotização	São Luis, Maranhão	Pelletising
VALE S.A/Complexo Serra Leste	Curionópolis, Pará	Iron ore

Source: Cardoso 2019, at 305, based on information provided by SUDAM.

The values of the 75% tax exemption of the IRPJ are not disclosed by either SUDAM or the Brazilian Federal Revenue Service (in Portuguese ‘Receita Federal’). As the Brazilian-based NGO INESC has pointed out, the latter collects the reduced value and therefore may calculate the exemption value, but it does not disclose the data on the basis of tax secrecy.¹²⁰ It only provides information on the amount of the tax exemptions received by broad economic sectors such as “industrial sector”, without disaggregating it further. Regarding disclosure by companies on the amount of SUDAM tax exemptions they have received, from our research it is clear that not all the examined companies provide information on the amount of these tax exemptions and those who provide information on this, only provide information that is partial and highly complex.

Table 8 shows the estimated yearly amount of the exemptions to the IRPJ granted in the SUDAM to the entire industrial sector from 2015 to 2018, calculated by the Brazilian Federal Revenue Service based on actual data from the previous five years:

Table 8: Estimated IRPJ exemptions granted to the industrial sector in the SUDAM, 2015-2018.

Year	Amount in Brazilian Reals	Amount in USD
2015	1,472,828,457 ¹²¹	377,184,095
2016	1,569,620,153 ¹²²	481,611,534
2017	1,501,718,707 ¹²³	453,965,751
2018	2,259,168,682 ¹²⁴	583,041,365
Total	6,803,335,999	1,895,802,745

Source: The Brazilian Federal Revenue Service. To convert Brazilian Reals to USD, we used the official exchange rate of the last day of the given year, provided by Brazil's Central Bank. See [Currency Conversion \(bcb.gov.br\)](http://www.bcb.gov.br).

The estimated total value of the exemptions to the IRPJ granted in the SUDAM to the industrial sector from 2015 to 2018 amounts to over USD 1.8 billion. If we only take the value for the year 2018, USD 583 million, we can compare it with the total budget for Brazilian government's life-saving social protection grants called "Bolsa Familia", which gave an average monthly payment of Brazilian Reals \$182.5 per family in 2018,¹²⁵ an equivalent of USD 56.1 (at the exchange rate of 2nd January 2018).¹²⁶ There were approximately 2.9 million recipients of *Bolsa Familia* in the states that make up Brazil's Legal Amazon in 2018.¹²⁷ Based on this information, the SUDAM tax exemptions on a corporate tax, IRPJ, to the industrial sector in 2018 could have paid for nearly 800,000 recipients of *Bolsa Familia* for an entire year (13 payments per year of Brazilian Reals 182.5).¹²⁸ Many of the *Bolsa Familia* recipients are disproportionately from Quilombola, riverine and indigenous communities. A study published in 2016 shows that 61.2% of Quilombola community members were recipients of *Bolsa Familia*.¹²⁹ State budget policies should favour these disadvantaged communities, rather than give subsidies to large multinational companies.

This data demonstrates that over the course of just four years, just one corporate tax exemption to the whole industrial sector deprived the public purse of approximately over USD \$1.8

billion. While there is no way of knowing how companies would have responded to a removal of this exemption and what their revenues and profits would have been, this tax exemption represents critical resources that arguably could have been collected and spent protecting this critical ecosystem and supporting the Quilombola, riverine and indigenous communities of the Brazilian Amazon with critical public services and sustainable infrastructure. What's more, according to the Brazilian Federal Revenue Service, the estimated total value of the exemptions to the IRPJ granted in the SUDAM to all economic sectors from 2015 to 2018 is over USD \$3,5 billion (see Annex table A4 for data).

The lack of transparency on the amount of tax exemptions granted in the SUDAM to specific companies is compounded by the lack of transparency on approvals of, and compliance with the conditions for, these tax exemptions. While it is often argued that corporate tax benefits attract investors and support companies to create jobs, stimulate local development and contribute to environmental sustainability, this lack of transparency prevents a more comprehensive evaluation of these exemptions, including their full socioeconomic and environmental costs and whether they may be contributing to achieving their purported objectives or any broader development aims.¹³⁰ With regards to mining specifically, tax incentives are also unnecessary. As Christian Aid and partners have maintained, resource-seeking investments such as those in extractives industries are known not to be sensitive to tax incentives, since the physical attributes of the location (e.g., availability of natural resources) are of primary consideration.¹³¹ Furthermore, the ICMS exemption for exports, originally adopted when there was a need to generate foreign currencies and improve Brazil's trade balance, is now no longer justified in terms of this objective. Brazil has run trade surpluses for 7 out of the last 10 years.¹³² Its main exports are agricultural products, minerals and oil. The exemptions of PIS/PASEP and COFINS for exports, together with the ICMS exemption, in addition to reducing government revenues, also risk discouraging the generation of downstream industries in Brazil. It is ultimately impossible to know whether companies which have benefited from tax exemptions would have invested in the same way with the same results in the absence of the exemptions, but there is little evidence to suggest the exemptions were the key motivating factor for many companies. Instead of granting tax exemptions, governments should consider imposing additional charges and taxes to mining activities in resource-rich areas to compensate for their

The lack of transparency on the amount of tax exemptions granted in the SUDAM to specific companies and on approvals of, and compliance with the conditions for, these tax exemptions prevent a more comprehensive evaluation of these exemptions, including their full socioeconomic and environmental costs.

socioenvironmental impacts and finance sustainable productive activities.

Large international aluminium producers operating in Brazil's Amazon have also received other economic benefits from Brazil's government. Several sources have reported for instance that Alcoa-controlled Alumar and Hydro's Alunorte, which are both alumina refineries and as such, are highly energy intensive, have received subsidised energy from the beginning of their operations, in 1984 and 1995, respectively.¹³³ With energy costs accounting for about 30 percent of the total costs of alumina refining in Brazil,¹³⁴ this represents another significant public subsidy to a large, internationally-controlled company. What's more, this energy comes from the Tucuruí hydroelectric dam, which has also been extensively documented to have had significant harmful social and environmental impacts, particularly on indigenous communities.¹³⁵

In sum, the policy decision by the Brazilian government to grant tax exemptions to all levels of the aluminium value chain and the high vertical ownership concentration that exists in this chain multiply benefits to large aluminium producers and mining companies. Specifically, our research demonstrates that as a result of these two elements, a few international aluminium producers and mining companies have benefited from massive cumulative tax exemptions across this value chain, including the exemptions received by MRN and the other two other bauxite mining companies operating in Brazil's Amazon. These two elements contribute to state budgets that provide essential public services and fulfilling human rights to local communities being constrained.

4.5. Responsibilities of those MRN's shareholders that are its main buyers

The above analysis of the shareholder composition of bauxite mining companies operating in Brazil's Amazon — i.e., MRN, Hydro Paragominas and Juruti — and the destination of their bauxite sales demonstrates several important points: First, large aluminium producers and mining companies, particularly multinational enterprises, have significant shareholdings in these mining companies. These multinational enterprises are Norsk Hydro, Alcoa, Vale and South32. For example, Hydro Paragominas and Juruti are controlled by Norsk Hydro and Alcoa respectively. As mentioned above, Vale currently owns a 40% share of MRN and as recently as July 2019, it recognised publicly that MRN was its subsidiary, which means that Vale

controlled MRN.¹³⁶ In the case of MRN, it is worth adding that although Rio Tinto has less significant shareholding in this company, its own annual report documents that “it has a representation on its board of directors and a consequent ability to participate in the financial and operating policy decisions.”¹³⁷ In Rio Tinto’s response to a draft of this report, it also stated that “Rio Tinto participates in the board of MRN, and has representation in various shareholder oversight committees, including the regular participation of a fully dedicated communities and social performance subject matter expert.”¹³⁸ Similarly, in Hydro’s response to a draft of this report, it stated that Hydro is “part of MRN’s Board ... and is constantly engaged with MRN”¹³⁹ This clearly demonstrates that large aluminium producers and mining companies, particularly multinational corporations, have significant influence in the operating policy decisions of bauxite mining enterprises operating in this region.

Second, we established that enterprises controlled by international aluminium producers and mining companies or enterprises in which these companies have a significant shareholding have benefited in various ways from MRN’s bauxite mining operations for the last ten years. Sourcing significant amounts of bauxite from MRN has been the most notable of these economic benefits. We also found evidence that these companies have benefited from the activities of the other two bauxite mining companies operating in the Brazilian Amazon, Hydro Paragominas and Juruti.

Based on these findings, this report maintains that large aluminium producers and mining companies, particularly multinational corporations, have a responsibility for the continuance of operations of bauxite mining companies in Brazil’s Amazon and its human rights and environmental impacts. Well-recognised standards of international law on business and human rights, tort law, environmental law and new approaches in company law are among the main sources for this responsibility.¹⁴⁰

In this regard, the UN Guiding Principles on Business and Human Rights adopted in 2011 assert that companies such as Norsk Hydro, Alcoa, Rio Tinto, South32 and other companies that source, or have sourced, significant amounts of bauxite from MRN, have the responsibility to conduct human rights due diligence in relation to MRN’s mining operations.¹⁴¹ This includes the responsibility “to take appropriate action” to prevent and mitigate adverse human rights impacts directly linked to their operations, products or services through their business relationships.¹⁴² Following Principle 19 of the UN

Guiding Principles on Business and Human Rights, the fact that the main buyers of bauxite mined by MRN for the last ten years have been its own shareholders or their subsidiaries strengthens this responsibility, as significant shareholding is an important source for leverage in addressing adverse human rights impacts related to its business relationship with another entity.¹⁴³ The Commentary to the UN Guiding Principles adds: “If the business enterprise has leverage to prevent or mitigate the adverse impact, it should exercise it.”¹⁴⁴ In the case of Rio Tinto, as mentioned above, its annual report literally documents such leverage, noting that “it has a representation on [MRN’s] board of directors and a consequent ability to participate in the financial and operating policy decisions.”¹⁴⁵ Norsk Hydro, Alcoa, Rio Tinto and South32 have adopted human rights policies that explicitly claim to be in line with these Guiding Principles and commit to undertaking human rights due diligence activities to identify, prevent and mitigate adverse human rights [as well as environmental] impacts of their operations, including through their business relationships.¹⁴⁶

Yet, in terms of compliance with these responsibilities, we have found little evidence these policies are adequately implemented in relation to MRN’s operations in the Brazilian Amazon. An analysis of annual reports from 2018 to 2021 revealed that out of Norsk Hydro, Alcoa, Rio Tinto and South32, only Norsk Hydro mentioned social and environmental impacts of MRN’s operations:

“In the municipality of Oriximiná in Pará, where the MRN bauxite mine is located, there is an ongoing dispute between Quilombola communities and Brazilian authorities regarding title to land owned by the federal government. The territory claimed by these communities encompasses certain areas that are planned to be mined by MRN in the future, but MRN is not a legal party in this conflict. *Hydro has requested through MRN’s board of directors and committees that the scope of the planned environmental and social impact assessment (ESIA) complies with local, national and international standards.*”¹⁴⁷

While this is potentially a positive example of Norsk Hydro using its ‘leverage’ as a shareholder of MRN and main buyer to direct it to ensure the planned environmental and social impact assessment related to the areas to be mined complies with local, national and international standards, it still falls short of Norsk Hydro taking its full responsibility in this matter. Its annual report only refers to potential new environmental and

Only one out of 4 international mining companies and aluminium producers studied addressed environmental and human rights impacts caused by MRN’s bauxite mining in the Brazilian Amazon in their 2018-2021 annual reports

 Alcoa

 South32

 Rio Tinto

 * Norsk Hydro

* Partial action taken.

social impacts of land yet to be mined. This leaves out the countless social and environmental impacts of MRN operations that local communities have reported as having already caused significant harm and damage. This responsibility also goes beyond the direct areas that are mined by MRN, because the impacts of its operations are felt across a much wider geographical scope, for instance through the pollution of waterways. As a shareholding company that sources large amounts of bauxite from MRN, Norsk Hydro should be publicly reporting on steps it is taking to mitigate these past and ongoing harms, as should Alcoa, Rio Tinto and South32.

While Christian Aid will soon publish a dedicated report examining the climate justice dimension of the type of industrial-scale mining discussed in this report that relies on deforestation,¹⁴⁸ we consider that this type of mining is ultimately incompatible with climate justice and Brazil's commitments to global climate action. The 2022 Climate Action Tracker rated Brazil's climate targets and policies as "highly insufficient", indicating that "Brazil's 2030 target leads to rising, rather than falling, emissions, and is not at all consistent with the Paris Agreement's 1.5C temperature limit."¹⁴⁹ The tracker also notes that, "the continued roll-back of forest protection policies is enabling ever higher deforestation rates, pushing emissions from Brazil's largest source – deforestation – upwards after than a decade of decline."¹⁵⁰

And yet, with huge profits to be made, we find these international shareholders sourcing large amounts of bauxite from MRN and receiving other significant economic benefits from MRN's operations, while failing to meet their responsibilities under international human rights and environmental standards regarding their business relationships with MRN. This prioritisation of profit-making over the short term by shareholders, above all other concerns, has been considered by many researchers and practitioners as a key barrier to ensure human rights are respected and the environment is protected by businesses.¹⁵¹ In this report, we have revealed how short-term profit maximisation by large aluminium producers and mining companies is a structural driver of the unsustainable exploitation of Brazil's Amazon by industrial bauxite mining and must ultimately be challenged and overcome.

And yet, with huge profits to be made, we find these international shareholders continuing their practices, sourcing large amounts of bauxite from MRN while failing to meet their responsibilities under international human rights and environmental standards regarding their business relationships with MRN.

5. Conclusions and recommendations

This report sought to analyse state tax policies and corporate short-term profit maximisation as structural economic factors that enable the unsustainable exploitation of Brazil's Amazon and adverse environmental and social impacts on local communities by industrial bauxite mining.

This report demonstrates that Brazil's tax policies grant large cumulative tax exemptions to bauxite mining companies operating in Brazil's Amazon. Tax exemptions to the IRPJ, a corporate income tax, can reach up to 82.5% of the IRPJ due and the value of just one corporate tax exemption to just one company, MRN, amounts to more than what the Oriximiná's municipality approximately generated in taxes, fees and charges over a ten-year time period.¹⁵² The exemptions for ICMS, COFINS and PIS/PASEP on goods intended for export are also significant for bauxite mining companies.

This report demonstrates that the policy decision by the Brazilian government to grant tax exemptions to all levels of the aluminium value chain and some key actions of large aluminium producers and mining companies multiply economic benefits to these companies resulting from such tax exemptions. Concentrating ownership within the three levels of this value chain and adopting a trade pattern characterised by a very high percentage of transactions between related parties are the most important of the actions taken by these companies. Specifically, we have shown that as a result of this policy decision and corporate actions, a few international aluminium producers and mining companies have benefited from massive cumulative tax exemptions across this value chain, including the exemptions received by MRN and the other two other bauxite mining companies operating in Brazil's Amazon. These companies do so with little transparency on key elements of the tax exemptions they receive, creating a fertile environment for tax abuse. Collectively, that means that Brazil's tax and related policies effectively transfer the wealth of the Brazilian Amazon's global commons - unique tropical forests, water supplies, mineral resources and ancestral lands collectively managed - into the hands of a few large international mining companies and aluminium producers and trap the region in an extractive development model. In contrast, governments and, by extension, local communities get little taxes from an industry that incurs significant social and environmental costs, with particularly adverse impacts for both the peoples of the Amazon, particularly the indigenous,

Quilombola and riverine communities, and the Amazon biome.¹⁵³

This report also demonstrates that the SUDAM tax exemptions on IRPJ, a corporate tax, to the industrial sector in 2018 could have paid for nearly 800,000 recipients of *Bolsa Familia* for an entire year (13 payments per year of Brazilian Reals 182.5).¹⁵⁴ Many of the *Bolsa Familia* recipients are disproportionately from Quilombola, riverine and indigenous communities.¹⁵⁵ This is a significant example of how Brazil's tax policies give subsidies to companies while cutting state budgets to provide essential public services and fulfilling human rights to local communities.

The Brazilian government must protect the biodiversity of Brazil's Amazon and the communities that have protected it for centuries, and stop providing incentives for businesses to exploit this region for corporate profits.¹⁵⁶ The costs of industrial bauxite mining for local communities have been very high. According to research conducted by Brazilian civil society organisations and researchers, MRN's mining operations in Oriximiná have caused serious adverse human rights and environmental impacts on Quilombola and riverine communities.¹⁵⁷ The human rights impact include watercourses pollution, hindering the access of local communities to quality water, generating diseases and impacting on fishing activity,¹⁵⁸ and affections to access to food and natural resources that support livelihoods for local communities due to deforestation induced by MRN's mining.¹⁵⁹ This report also demonstrates that Norsk Hydro, Alcoa, Rio Tinto and South32 have significant influence in, and benefit in various ways from, the operations of bauxite mining companies operating in Brazil's Amazon. In particular, these companies source, or have sourced, significant amounts of bauxite from these companies. Based on these findings, this report maintains that these large aluminium producers and mining companies have a responsibility for the continuance of operations of bauxite mining companies in Brazil's Amazon and their human rights and environmental impacts. Yet, these companies continue to pursue short-term profit maximisation by failing to demonstrate they have taken adequate actions with regards to adverse human rights and environmental impacts caused by MRN's operations and continue to source large amounts of bauxite from MRN, while significantly benefitting from the tax exemptions it enjoys and receiving other economic benefits from MRN's operations.

Ultimately, Brazil's tax policies and corporate short-term profit maximisation are two key structural factors that need to be changed to put people and the planet before private profits.

Recommendations

To Brazil's Federal government and governments in relevant Brazilian states such as Pará and Maranhão

- Comprehensively and publicly evaluate and count the costs and benefits of mining operations in the Brazilian Amazon to the human rights of local communities, the environment and the ecosystem services these depend on an ongoing basis.
- Prioritise the rights and voice of these populations and the preservation of ecosystem services the region provides over the short-term. Ban new mining exploration in this region and take effective measures to ensure that industrial mining companies prevent and mitigate the harmful social and environmental impacts of their operations and provide effective remedy for those impacts already caused. Take effective measures to phase out existing mining operations in this region over the medium to long term. In consultation with the affected local communities, design a plan to do this phase out responsibly and take effective measures to transform the economy of the Amazon towards one anchored on human rights and ecological principles.
- Ensure that mining and related sectors involved in the aluminium value chain are adequately taxed. Take decisive action to eliminate tax exemptions in relation to these sectors, particularly in the Amazon. Put in place clear, transparent and credible political, legal and technical processes for discussing tax exemptions. Ensure informed and effective participation of local communities in the design, decision-making and supervision of these tax policies.
- Regarding any tax exemption to be maintained, disclose sufficient information on key elements of it to allow the stakeholders to make a full evaluation of it, including its socioeconomic costs and whether it contributes to achieving the objectives it pursues. Currently, there is no sufficiently disaggregated public information on exemptions to IRPJ, ICMS and other taxes. In addition, provide, pursuant to the Law of Fiscal Responsibility, full information on the fiscal impact of any given tax exemption and identify how the government is compensating for the reduced fiscal income.¹⁶⁰
- Ensure higher transparency along the aluminium value chain, particularly in price setting and public beneficial ownership registries to find the real owners of companies, trusts and other legal vehicles. Improve access to public

information on multinational enterprises' operations on the basis of public country-by-country reporting, starting with a mandate to publish these for all companies in the extractive industries, including project-by-project reporting.

- To increase transparency on taxes paid by mining companies, Brazil should become a member of the Extractives Industries Transparency Initiative (EITI) and other international initiatives seeking that objective.
- Provide a greater proportion of governmental income from taxes to mining and other sectors involved in the aluminium value chain to be channelled to the provision of public services, social protection and other measures to address poverty, inequality and to at least partially compensate for the social and environmental impacts caused by these industries to local communities.
- The Federal tax administration should examine information on bauxite extraction and sales, verify compliance with tax obligations by mining companies and buyers, and assess and address the implications of relationships between companies in a highly vertically integrated aluminium value chain, including for the risk of tax abuse.

To countries in which parent companies of named aluminium producers and industrial mining companies are based, namely Norway, the United States, the United Kingdom and Australia

- Adopt binding regulations requiring companies in these sectors to take effective measures to prevent and mitigate adverse human rights and environmental impacts linked to their operations, including through their business relations. This should include adopting mandatory regulations on corporate human rights and environmental due diligence, especially in business relations, in all economic sectors, and putting in place effective supervisory mechanisms to ensure this legislation is effectively implemented. This should also include supporting a binding treaty on business and human rights that reaffirms wider obligations and includes avenues for access to effective remedy.
- Regulate for mandatory public country-by-country reporting in terms of the profits and other key financial data in all jurisdictions where the company operates, and in the case of extractive industries outlining this also on a project-by-project basis to understand taxes paid per project they participate. Regulating also for mandatory public beneficial

ownership registries of all shareholders is also vital, including in all overseas territories, dependent jurisdictions and crown dependencies where such exist. Mandate declaration of all tax exemptions received in annual accounts and economic impact reports in addition to taxes paid.

- Demand aluminium producers and industrial mining companies with significant business operations in your jurisdiction to prioritise in their sourcing bauxite mined in regions other than tropical forests, even if it is more expensive. Require companies in these sectors to design a plan to make their exit from tropical forests responsibly.

To international aluminium producers and mining companies

- Publicly evaluate and count all the costs and benefits of mining activities in Brazil's Amazon to the human rights of local communities, environmental integrity and the ecosystem services these depend on. Prioritise the rights of these populations and the preservation of ecosystem services the region provides over profit. This means prioritizing bauxite mined in other regions in your sourcing, even if it is more expensive. Take effective measures to rapidly decrease sourcing of bauxite mined in Brazil's Amazon. Design a plan to make your exit responsibly. To prepare such a plan, conduct consultations with the affected local communities.
- If your company continues sourcing bauxite mined in Brazil's Amazon, take appropriate actions to prevent and mitigate adverse human rights and environmental impacts linked to the operations of mining companies operating in Brazil's Amazon from which you source. Disclose sufficient information on this. This encompasses undertaking rigorous human rights and environmental due diligence, including through your business relationships. It also includes paying your fair share of taxes across your value chain and avoiding pursuing tax schemes and structures that minimise your financial contribution to society.
- Disclose full information on the tax exemptions that your company has received for the last ten years. Disclose voluntarily, even when not legally mandated, public country-by-country reports outlining all taxes paid in each country and jurisdiction,¹⁶¹ including project-by-project accounts to outline the taxes paid in each project a company participates in a country, including MRN.

- Abstain from lobbying Brazil's Federal government and state governments to ask that existing tax exemptions applicable across the aluminium value chain in Brazil are maintained and publicly report any lobbying activities you are undertaking or any relation or donation to policy makers or political parties.

Recommendations on aluminium use

To national and regional regulators of industrial sectors that use significant amounts of aluminium such as producers of electrical transmission lines, cans, foil, utensils, paints, and airplane parts

- Require companies in these sectors to take effective measures to prevent and minimise adverse human rights and environmental impacts linked to their operations, including through their supply chain. This should include adopting mandatory regulations on corporate human rights and environmental due diligence, especially in business relations; and supporting a binding treaty on business and human rights that includes avenues for access to effective remedy.
- Require companies in these sectors to design and implement effective methods to reduce use of primary aluminium and increase use of recycled aluminium and other materials whose production has much less social and environmental impacts than primary aluminium.

To industrial sectors around the world that use significant amounts of aluminium

- Undertake rigorous human rights and environmental due diligence, covering not only the production of primary aluminium, but also bauxite mining and the production or generation of other important inputs such as alumina and energy. This includes taking appropriate action to prevent and mitigate adverse human rights and environmental impacts directly linked to your operations, products or services through your business relationships.
- Develop effective methods to reduce use of primary aluminium and increase use of recycled aluminium and other materials whose production has much less social and environmental impacts than primary aluminium.

To citizens

- Lobby governments and intergovernmental bodies for mandatory corporate human rights and environmental due diligence, and for a binding treaty on business and human rights that includes avenues for access to effective remedy.
- Lobby governments to include taxation as a business and human rights issue, due to both its direct impacts of incentivising extractive operations and indirect impacts in terms of mobilising resources needed for the fulfilment of human rights obligations by states.
- Demand governments to adequately regulate and supervise primary aluminium producers and other actors in the chain.
- Lobby governments and intergovernmental bodies for mandating transparency in the aluminium value chain and in products that are aluminium intensive, particularly on the origin of the bauxite used and the implementation of effective human rights and environmental due diligence at various levels of the chain.
- Lobby governments and intergovernmental bodies to mandate public country-by-country reporting to all companies, mandatory public disclosures of tax exemptions and mandatory public registries of all beneficial owners.
- Demand industrial sectors to develop effective methods to reduce use of primary aluminium and increase use of recycled aluminium.

Annex

Table A1. Progression of deforestation of the Saracá-Taquera National Forest due to the Porto Trombetas mining complex owned by MRN (1979-2020).

Period	Deforested area (hectares)	Yearly deforested area average (hectares)
Mining up to 1985	784.82	130.80
Increase 1986 -1990	549.53	109.91
Increase 1991 -1995	749.25	149.85
Increase 1996 -2000	1,140.27	228.05
Increase 2001 – 2005	2,032.01	406.40
Increase 2006 – 2010	1,662.58	332.52
Increase 2011 – 2015	1,859.23	371.85
Increase 2016 -2020	2,066.73	413.35
Cumulative	10,844.42	264.50

Source: Wanderley, 2021.¹⁶²

Table A2: Annual percentage of MRN's sales to related parties.

Year	Annual percentage of sales to related parties
2012	100%
2013	98.46%
2014	98.76%
2015	98.79%
2016	96.88%
2017	97.42%
2018	97.27%
2019	99.64%
2020	100%
2021	100%

Source: MRN's annual reports.

Table A3: Annual amount of bauxite (in metric tons) that each of MRN's related party has sourced from MRN from 2015 to 2021, based on the information disclosed in MRN's annual reports.

Related party name	2015	2016	2017	2018	2019	2020	2021
Alcan Alumina Ltda.	2,390,961	950,358	886,5001	1,105,287	679,546	938,299	674,679
Rio Tinto Alcan Inc.	1,264,607	2,615,556	2,341,838	2,378,060	2,145,742	1,925,647	2,148,593
Alcoa Alumínio S.A.	(764)	15,358	-	-	273,972	0	
Alcoa World Alumina Ltda.	86	94,674	624,373	770,305	239,297	-	
Alcoa World Alumina LLC - A.W.A.	2,668,928	2,633,559	1,990,971	1,566,697	989,244	1,346,224	1,368,934
Alunorte - Alumina do Norte do Brasil S.A.	4,313,725	4,136,347	4,173,913	2,176,147	2,936,963	4,400,496	4,065,624
South32 Minerals S.A.	1,998,166	3,146,916	3,312,607	3,145,462	2,252,310	2,991,670	3,055,301
South32 Marketing PTE Ltd.	1,181,946	65,756	-	-	-	-	
Norsk Hydro Brasil Ltda.	(936)	-	-	-	-	-	
Hydro Aluminium International S.A.	3,964,669	3,867,721	2,972,761	3,255,897	2,616,125	1,313,663	1,174,869
Total amount of bauxite tons sold to related parties	17,781,388	17,526,245	16,302,964	14,397,856	12,133,198	12,916,000	12,488,000

Source: MRN's annual reports.

Method: The annual amount of bauxite in metric tons that each MRN's related party has sourced from MRN from 2012 to 2021 was calculated by dividing the annual value of the bauxite purchases by each related party to MRN in Brazilian Reals, information included in MRN's annual reports, by the average annual price of a bauxite metric ton charged by MRN in its sales. The latter was calculated by dividing the value of MRN's total sales of bauxite (value under the category "Vendas de mercadorias, produtos e serviços" in Portuguese), included in MRN annual reports, by the tons of bauxite sold by MRN the given year, also reported in MRN annual reports. It should be noted that for some years there is a difference between the total amount of bauxite tons sold by MRN and the amount of bauxite tons sold by MRN to related parties. The reason for this difference is that for these years, MRN sold part of its bauxite production or stock to non-related parties.¹⁶³

Table A4: Estimated IRPJ exemptions granted to all economic sectors in the SUDAM, 2015-2018

Year	Amount in Brazilian Reals	Amount in USD
2015	1,836,897,007 ¹⁶⁴	468,763,590.82
2016	2,861,514,373 ¹⁶⁵	878,007,539.81
2017	3,704,359,176 ¹⁶⁶	1,119,818,372.43
2018	4,047,791,826 ¹⁶⁷	1,044,645,356.15
Total	12,450,562,382	3,511,234,859.21

Methodology: To do the conversion from Brazilian Reals to USD, the official exchange rate of the last day of the given year was used. For the official exchange rate, see: [Currency Conversion \(bcb.gov.br\)](http://www.bcb.gov.br).

MRN's response to a draft of this report:

Excerpt 1:

"[MRN] has a team of experts in reforestation, having restored c.a. 7.5 thousand hectares over the past 42 years, where more than 14.5 million seedlings of 450 native tree species have been planted to keep a 1:1 rehabilitation policy. MRN also has a long-term partnership with ICMBio, providing financial support to the federal agency for the protection and maintenance of the [Saracá Taquera] National Forest."

Excerpt 2:

"The consultation with two Quilombola communities (Alto Trombetas 2 and Boa Vista) complies with specific protocols designed by the Quilombolas communities and coordinated by competent federal authorities, as defined by the Brazilian legislation. MRN supports the process by providing independent technical advisory to the communities, contributing to the assurance of their right to fully and meaningfully participate in the decisions regarding new projects."

End notes

- ¹ See e.g., *Estudo do Componente Quilombola (ECQ) do Projeto Novas Minas (PNM)*. Golder Associates Brasil Consultoria e Projetos Ltda. In *Estudo de Impacto Ambiental PNM Volume II, Annex CI*. September 2022, at 1564-1566, 1572-1575, 1615-1617.
http://licenciamento.ibama.gov.br/Mineracao/MRN%20-%20Projeto%20Novas%20Minas%20PNM/5%20-%20EIA__Volume_II__Parte_3.pdf *Antes a água era cristalina, pura e sadia: percepções quilombolas e ribeirinhas dos impactos e riscos da mineração em Oriximiná, Pará*. Lúcia M. M. Andrade. Comissão Pró-Índio de São Paulo. 2018, at 42-50.
https://cpisp.org.br/wp-content/uploads/2019/02/Antes_agua_era_cristalina.pdf
Barragens de mineração na Amazônia: o rejeito e seus riscos associados em Oriximiná. Wanderley, Luiz Jardim. Comissão Pró-Índio de São Paulo. 2021.
https://cpisp.org.br/wp-content/uploads/2021/04/SerieEstudos_BarragensMineracao.pdf
- ² *Barragens de mineração na Amazônia*. Wanderley. 2021. See also *Estudo do Componente Quilombola (ECQ) do Projeto Novas Minas (PNM)*. Golder Associates Brasil Consultoria e Projetos Ltda. In *Estudo de Impacto Ambiental PNM Volume II, Annex CI*. September 2022, at 1564-1566, 1572-1575, 1615-1617.
http://licenciamento.ibama.gov.br/Mineracao/MRN%20-%20Projeto%20Novas%20Minas%20PNM/5%20-%20EIA__Volume_II__Parte_3.pdf *Floresta Nacional de Saracá-Taquera: a quem se destina? Conflitos entre uso tradicional e exploração empresarial*. Ítala Nepomuceno. 2021. Comissão Pró-Índio de São Paulo. 2021.
https://cpisp.org.br/wp-content/uploads/2021/09/SerieEstudos_SaracaTaquera.pdf
- ³ Undermining Resilience: climate change, rights and mining in the Brazilian Amazon. Christian Aid. Forthcoming.
- ⁴ While we could not find data on how much the Oriximiná's municipality generated in taxes, fees and charges for the last ten years, we found that the total revenue for taxes, fees and charges forecasted in Oriximiná municipality's budget for 2021 was Brazilian Reals 36,880,350, which amounted to USD 7,096,879. See *Orcamento Programa para 2021 - consolidado [program of budget for 2021-consolidated]*. Governo Municipal de Oriximiná [Oriximiná's municipal government]. 2021.
https://oriximina.pa.gov.br/arquivos/1090/ANEXOS%20LOA%20-%202021_002_2020_0000001.pdf Then, we multiplied this amount times ten to arrive at this estimate.
- ⁵ *Use and Abuse of Tax Breaks: How Tax Incentives Become Harmful*. Alvic Padilla (lead author), Neeti Biyani, Suraj Jaiswal, Mae Buenaventura, Jared Maranga and Toby Quantrill. Christian Aid, Norad, Asian People's Movement on Debt and Development, CBGA and Tax Justice Network Africa, January 2020, at 6.
<https://www.christianaid.org.uk/sites/default/files/2020-01/Use%20and%20Abuse%20of%20Tax%20Breaks.pdf>
- ⁶ Brazil's Quilombola communities originate from the mid-16th century, when groups of Africans and Afro-descendants escaped from slavery and joined together in close-knit communities to resist recapture, occupying hard-to-reach lands outside plantations. See 'Making Their Own Way: Brazil's Quilombola Communities.' David Feischer. Inter-American Foundation. 2021.
<https://www.iaf.gov/content/story/making-their-own-way-brazils-quilombola-communities/> See also 'Quilombolas no Brasil.' Comissão Pró-Índio de São Paulo.
<https://cpisp.org.br/direitosquilombolas/observatorio-terras-quilombolas/quilombolas-brasil/>
- ⁷ Ibid.
- ⁸ See also 'Isencoes fiscais para-empresas na amazonia mais de 50 anos sem transparencia e efetividade.' INESC. 2019
<http://amazonia.inesc.org.br/materias/isencoes-fiscais-para-empresas-na-amazonia-mais-de-50-anos-sem-transparencia-e-efetividade/>
- ⁹ Please note, each of the companies named in this report were provided with an opportunity to respond before its publication. We received responses from four companies, namely MRN, Vale, Norsk Hydro and Rio Tinto, which we have taken into consideration in preparing the final version of this report.
- ¹⁰ See e.g., *Guiding principles on business and human rights: Implementing the United Nations "Protect, Respect and Remedy" framework*. United Nations. 2011. Principle 13.
- ¹¹ 'The Amazon.' WWF. 2022.
<https://www.worldwildlife.org/place/s/amazon>
- ¹² 'Why the Amazon.' Amazon Conservation. 2022.
<https://www.amazonconservation.org/the-challenge/why-the-amazon/>

- ¹³ *Mining drives extensive deforestation in the Brazilian Amazon.* L.J. Sonter, D. Herrera, D.J. Barrett *et al.* *Nature Communications* vol. 8, 1013, 2017. <https://doi.org/10.1038/s41467-017-00557-w>
- ¹⁴ *Ibid.*
- ¹⁵ *Ibid.*
- ¹⁶ See Mapbiomas Brasil, <https://mapbiomas.org/>
- ¹⁷ *Undermining Resilience: climate change, rights and mining in the Brazilian Amazon.* Christian Aid. Forthcoming.
- ¹⁸ 'Making Their Own Way: Brazil's Quilombola Communities.' David Feischer. Inter-American Foundation. 2021. See also 'Quilombolas no Brasil.' Comissão Pró-Índio de São Paulo.
- ¹⁹ See e.g., *Conflitos territoriais entre comunidades tradicionais e concessões florestais: um estudo de caso a partir da Floresta Nacional de Saracá-Taquera, Oriximiná, Pa.* Ítala Tuanny Rodrigues Nepomuceno. Dissertation, Master in Natural Resources in the Amazon, Federal University of the West of Pará, Santarém. 2017. <https://repositorio.ufopa.edu.br/jspui/handle/123456789/258>
- ²⁰ For more information, see below section 3.
- ²¹ *Mineral Commodity Summary: Bauxite and Alumina.* US Geological Survey. 2022. <https://pubs.usgs.gov/periodicals/mcs2022/mcs2022-bauxite-alumina.pdf>
- ²² Estatísticas. Associação Brasileira do Alumínio – ABAL [Brazilian Association of Aluminum]. <http://abal.org.br/estatisticas/nacionais/bauxita/>
- ²³ *Barragens de mineração na Amazônia: o rejeito e seus riscos associados em Oriximiná.* Luiz Jardim Wanderley. Comissão Pró-Índio de São Paulo. 2021. https://cpisp.org.br/wp-content/uploads/2021/04/SerieEstudos_BarragensMineracao.pdf
- ²⁴ It was provided for by the Supplementary Law 87/1996 (known as the Kandir law) transformed into Constitutional Amendment No. 42/2003.
- ²⁵ Brazil: Corporate - Other taxes. PWC. <https://taxsummaries.pwc.com/brazil/corporate/other-taxes>
- ²⁶ 'Brasil fiscalidad.' Santander trade. <https://santandertrade.com/es/porta/establecerse-extranjero/brasil/fiscalidad>
- ²⁷ *Boletim de Arrecadação dos Tributos Estaduais.* Conselho Nacional de Política Fazendária (CONFAZ). <https://www.confaz.fazenda.gov.br/boletim-de-arrecadacao-dos-tributos-estaduais>
- ²⁸ *Mineração em Números 2021, 2022.* Câmara Minera de Brasil [Brazilian Mining Association]. <https://ibram.org.br/publicacoes/?txtSearch=&checkbox-section%5B%5D=1236> 'Brazilian production of mineral sector grows 7% in 2021. Agência Brasil. [https://agenciabrasil.ebc.com.br/en/economia/noticia/2022-02/brazilian-production-mineral-sector-grows-7-2021#:~:text=In%202021%2C%20Brasil%20exported%20357.7,%25%20and%20Japan%20\(3.6%25\).](https://agenciabrasil.ebc.com.br/en/economia/noticia/2022-02/brazilian-production-mineral-sector-grows-7-2021#:~:text=In%202021%2C%20Brasil%20exported%20357.7,%25%20and%20Japan%20(3.6%25).)
- ²⁹ See article 14, paragraph II and § 1º of Provisional Measure 2158-35/2001. See also Law No. 10,637/2002 and Law No. 10,833/2003.
- ³⁰ International Tax: Brazil Highlights. Deloitte. January 2022. <https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Tax/dttl-tax-brazilhighlights-2022.pdf>
- ³¹ These states are Acre, Amapá, Amazonas, Maranhão, Mato Grosso, Pará, Rondônia, Roraima, and Tocantins. The Brazilian Legal Amazon is delimited by Article 2º of the Supplementary Law No. 124/2007.
- ³² Law No. 4,216, http://www.planalto.gov.br/CCivil_03/Leis/1950-1969/L4216.htm
- ³³ See Brazil's President, Law No. 13,799 of 3 January 2019. http://www.planalto.gov.br/ccivil_03/_ato2019-2022/2019/lei/L13799.htm For a summary, see 'Brasil prorroga los incentivos fiscales para proyectos de inversión en el ámbito regional.' Red de Oficinas Económicas y Comerciales de España en el Exterior, January 2019. <https://www.icex.es/icex/es/navegacion-principal/todos-nuestros-servicios/informacion-de-mercados/paises/navegacion-principal/noticias/NEW2019810945.html?idPais=BR>
- ³⁴ Resolution No. 93 of 13 August 2021 by SUDAM. Article 24. <http://repositorio.sudam.gov.br/sudam/condel/reunioes-resolucoes/2021/resolucao-no-93-2021/resolucao-no-93-de-13-de-agosto-de-2021.pdf/view>
- ³⁵ See Law No. 13,799/2019.
- ³⁶ It is included in *Regional Dynamics of the Brazilian Amazon: between Modernisation and Land Conflicts.* Franco da Silva, Carlos Alberto, & Bampi and Aumeri Carlos. Cuadernos de Geografía: Revista Colombiana de Geografía vol. 28(2), 2019, 340-356. <https://doi.org/10.15446/rcdg.v28n2.72872>
- ³⁷ See e.g., 'O caso da Hydro Alunorte no Pará é exemplar: o fim do sigilo fiscal dos gastos tributários é urgente.' INESC. September 2019. <http://amazonia.inesc.org.br/artigo>

[s-inesc/o-caso-da-hydro-alunorte-no-para-e-exemplar-o-fim-do-sigilo-fiscal-dos-gastos-tributarios-e-urgente/](https://www.inesc.org.br/incentivos-fiscais-e-gastos-tributarios-perspectivas-para-o-novo-governo/)

³⁸ See 'Incentivos fiscais e gastos tributários: perspectivas para o novo governo.' INESC. May 2019. <https://www.inesc.org.br/incentivos-fiscais-e-gastos-tributarios-perspectivas-para-o-novo-governo/>

³⁹ According to the U.S. Energy Information Administration, primary aluminium production involves making aluminium products from raw material or ingots, while secondary production involves recycling aluminium scrap to form new products. 'Energy needed to produce aluminum.' U.S. Energy Information Administration. August 2012.

<https://www.eia.gov/todayinenergy/detail.php?id=7570>

⁴⁰ According to the U. S. Geological Survey (USGS), approximately 85% of global bauxite production is used as feed for the manufacture of alumina, which in turn is converted in aluminium. <https://www.usgs.gov/centers/national-minerals-information-center/bauxite-and-alumina-statistics-and-information>

⁴¹ Hydro's 2021 annual report specifies that "Hydro refers to Norsk Hydro ASA and its consolidated subsidiaries if not otherwise stated." See Hydro's 2021 annual report at 3. For this reason, we use Norsk Hydro throughout this report.

⁴² See 'Main shareholders.' Hydro. <https://www.hydro.com/en/investors/the-hydro-share/main-shareholders/>

⁴³ 'Paragominas mine.' Norsk Hydro. <https://www.hydro.com/en/about-hydro/hydro-worldwide/north-america/brazil/paragominas/paragominas-mine/>

⁴⁴ Ibid.

⁴⁵ Norsk Hydro, 2021 annual report, at 83, footnote 1.

⁴⁶ Ibid, at 20.

⁴⁷ 'Alunorte.' Norsk Hydro. <https://www.hydro.com/en/about-hydro/hydro-worldwide/north-america/brazil/barcarena/alunorte/>

⁴⁸ See 'Albras.' Norsk Hydro. <https://www.hydro.com/ja-JP/hydronitsuite/hydronoguo-ji-judian/north-america/brazil/barcarena/albras/>

⁴⁹ Ibid.

⁵⁰ 'Estatísticas alumina.' Associação Brasileira do Alumínio [Brazilian Association of Aluminum]. <http://abal.org.br/es/estadistica/alumina/>

⁵¹ 'Brasil Juruti fact sheet.' Alcoa. <https://www.alcoa.com/brasil/pt/pdf/brasil-juruti-fact-sheet.pdf>

⁵² 'Estatísticas alumina.' Associação Brasileira do Alumínio [Brazilian Association of Aluminum]. <http://abal.org.br/es/estadistica/alumina/>

⁵³ See 'new company to be named south32.' BHP. 8 December 2014. <https://www.bhp.com/news/media-centre/releases/2014/12/new-company-to-be-named-south32>

⁵⁴ Section 'about us.' MRN. <https://www.mrn.com.br/index.php/en/who-we-are>.

⁵⁵ 'A Alumar bate recorde de produção de alumina desde a implantação do Consórcio.' Alcoa. 18 January 2021, <https://www.alcoa.com/brasil/pt/news/releases?id=2021/01/a-alumar-bate-recorde-de-producao-de-alumina-desde-a-implantacao-do-consorcio&year=z2021>

⁵⁶ MRN, 2021 Annual report, at 142.

⁵⁷ Amazonian quilombolas and the technopolitics of aluminum. Anibal Arregui. Journal of

Material Culture, 20(3), 2015. At 249. <https://doi.org/10.1177/1359183515578937>

⁵⁸ Alcoa, 2020 annual report.

⁵⁹ *Barragens de mineração na Amazônia*. Wanderley. 2021.

⁶⁰ *Anuário Mineral Brasileiro*. Agência Nacional de Mineração. <https://www.gov.br/anm/pt-br/centrais-de-conteudo/publicacoes/serie-estatisticas-e-economia-mineral/anuario-mineral/anuario-mineral-brasileiro>

⁶¹ See e.g., *Antes a água era cristalina, pura e sadia: percepções quilombolas e ribeirinhas dos impactos e riscos da mineração em Oriximiná, Pará*. Andrade. 2018. *Barragens de mineração na Amazônia*. Wanderley. 2021. *Floresta Nacional de Saracá-Taquera: a quem se destina?* Nepomuceno. 2021. See also references used in the next pages.

⁶² *Ecological Methods and Indicators for Recovering and Monitoring Ecosystems after Mining: A Global Literature Review*. Rocha Martins, Walmer Bruno, Michael Douglas Roque Lima, Udson De Oliveira Barros Junior, Larissa Sousa Villas-Boas Amorim, Francisco De Assis Oliveira, Gustavo Schwartz. *Ecological Engineering*, Vol. 45. 2020. [HTTPS://DOI.ORG/10.1016/J.ECOLENG.2019.105707](https://doi.org/10.1016/j.ecoeng.2019.105707)

⁶³ 'The steps in our production process.' MRN. <https://www.mrn.com.br/index.php/en/what-we-do/productive-process>

⁶⁴ See *Ecological Methods and Indicators for Recovering and Monitoring Ecosystems after Mining: A Global Literature Review*. Rocha Martins, Walmer Bruno, Michael Douglas Roque Lima, Udson De Oliveira Barros Junior, Larissa Sousa

Villas-Boas Amorim, Francisco De Assis Oliveira, Gustavo Schwartz.

⁶⁵ See Topography Definition and Meaning. Merriam-Webster dictionary. <https://www.merriam-webster.com/dictionary/topography>

⁶⁶ *Barragens de mineração na Amazônia*. Wanderley. 2021.

⁶⁷ Ibid.

⁶⁸ Ibid. See Annex, “MRN’s comments on a draft of this report”, excerpt 1.

⁶⁹ Mining drives extensive deforestation in the Brazilian Amazon. Laura J. Sonter, Diego Herrera, Damian J. Barrett, Gillian L. Galford, Chris J. Moran & Britaldo S. Soares-Filho. Nature Communications. 2017 https://www.nature.com/articles/s41467-017-00557-w.epdf?author_access_token=0zkGgfo8nzKvZWR59YoKx9RgN0jAjWel9jnR3ZoTv0PxaSsLyPxdt4mBwruClzKNSYm-akEL7-BllhZoszC4NGVL1IpcmV2RkLUYgNP4lRqWM00zXzXWI-y1dN5khtJb0ABGc8EEUkJENz9j4ETwA%3D%3D

⁷⁰ Ibid.

⁷¹ Ibid.

⁷² *Barragens de mineração na Amazônia*. Wanderley. 2021.

⁷³ Ibid. *Floresta Nacional de Saracá-Taquera: a quem se destina?* Nepomuceno. 2021

⁷⁴ *Estudo do Componente Quilombola (ECQ) do Projeto Novas Minas (PNM)*. Golder Associates Brasil Consultoria e Projetos Ltda. In *Estudo de Impacto Ambiental PNM Volume II, Annex CI*. September 2022, at 1564-1566, 1572-1575, 1615-1617. http://licenciamento.ibama.gov.br/Mineracao/MRN%20-%20Projeto%20Novas%20Minas%20PNM/5%20-%20EIA__Volume_II__Parte_3.pdf

⁷⁵ See ‘Mining and Refining – Water Management.’ World Aluminum.

<https://bauxite.world-aluminum.org/refining/water-management> Norsk Hydro, 2020 annual report, at 122.

⁷⁶ See *Antes a água era cristalina, pura e sadia: percepções quilombolas e ribeirinhas dos impactos e riscos da mineração em Oriximiná, Pará*. Andrade. 2018, at 42-50.

⁷⁷ See *Estudo do Componente Quilombola (ECQ) do Projeto Novas Minas (PNM)*. Golder Associates Brasil Consultoria e Projetos Ltda. In *Estudo de Impacto Ambiental PNM Volume II, Annex CI*. September 2022, at 1575-1577, 1585-1586.

⁷⁸ *Estudo do Componente Quilombola (ECQ) do Projeto Novas Minas (PNM)*. Golder Associates Brasil Consultoria e Projetos Ltda. In *Estudo de Impacto Ambiental PNM Volume II, Annex CI*. September 2022, at 1686-1687.

⁷⁹ Ibid, at 1687.

⁸⁰ *Estudo do Componente Quilombola (ECQ) do Projeto Novas Minas (PNM)*. Golder Associates Brasil Consultoria e Projetos Ltda. In *Estudo de Impacto Ambiental PNM Volume II, Annex CI*. September 2022, at 1533-1534. See also *Antes a água era cristalina, pura e sadia: percepções quilombolas e ribeirinhas dos impactos e riscos da mineração em Oriximiná, Pará*. Andrade. 2018, at 42-50.

⁸¹ *Antes a água era cristalina, pura e sadia: percepções quilombolas e ribeirinhas dos impactos e riscos da mineração em Oriximiná, Pará*. Andrade. 2018, at 27.

⁸² *Undermining Resilience: climate change, rights and mining in the Brazilian Amazon*. Nadia Saracini. Christian Aid. Forthcoming.

⁸³ Comissão Pró-Índio de São Paulo, Flona Saracá-Taquera (Oriximiná – Pará): pressões e ameaças. Available at: [https://cpisp.org.br/publicacao/fl](https://cpisp.org.br/publicacao/flona-saraca-taquera-e-processos-minerarios-oriximina-para/?portfolioCats=271%2C272%2C20%2C21%2C22)

[ona-saraca-taquera-e-processos-minerarios-oriximina-para/?portfolioCats=271%2C272%2C20%2C21%2C22](https://cpisp.org.br/publicacao/flona-saraca-taquera-e-processos-minerarios-oriximina-para/?portfolioCats=271%2C272%2C20%2C21%2C22)

⁸⁴ *Conflitos com Unidades de Conservação*. Comissão Pró-Índio de São Paulo. <https://cpisp.org.br/quilombolas-em-oriximina/luta-pela-terra/sobreposicao-uc-2/>

⁸⁵ *Antes a água era cristalina, pura e sadia: percepções quilombolas e ribeirinhas dos impactos e riscos da mineração em Oriximiná, Pará*. Andrade. 2018.

⁸⁶ ‘Mineração em Oriximiná.’ Comissão Pró-Índio de São Paulo. <https://cpisp.org.br/quilombolas-em-oriximina/luta-pela-terra/mineracao/>

⁸⁷ Ibid. See Annex, “MRN’s comments on a draft of this report”, excerpt 2.

⁸⁸ Ibid.

⁸⁹ MRN, *relatorio-de-sustentabilidade-mrn-2020*. 2021. At 93.

⁹⁰ See e.g., *Estudo do Componente Quilombola (ECQ) do Projeto Novas Minas (PNM)*. Golder Associates Brasil Consultoria e Projetos Ltda. In *Estudo de Impacto Ambiental PNM Volume II, Annex CI*. September 2022. http://licenciamento.ibama.gov.br/Mineracao/MRN%20-%20Projeto%20Novas%20Minas%20PNM/5%20-%20EIA__Volume_II__Parte_3.pdf *Antes a água era cristalina, pura e sadia: percepções quilombolas e ribeirinhas dos impactos e riscos da mineração em Oriximiná, Pará*. Andrade. 2018.

⁹¹ For this tax exemption, see Brazil’s President, Law No. 13.799 of 3 January 2019. http://www.planalto.gov.br/ccivil_03/_ato2019-2022/2019/lei/L13799.htm See also Normative Instruction SRF

267/2002 (Instrução Normativa SRF 267/2002), article 57.

⁹² MRN, 2021 annual report, at 159. <https://www.mrn.com.br/images/relatorioadm/relatorio-demonstracoes-financeiras-2021.pdf>

⁹³ See *Orcamento Programa para 2021 - consolidado [program of budget for 2021 - consolidated]*. Governo Municipal de Oriximiná [Oriximiná's municipal government]. 2021. https://oriximina.pa.gov.br/arquivos/1090/ANEXOS%20LOA%20-%202021_002_2020_0000001.pdf

⁹⁴ To do this conversion, we used the exchange rate of 31 December 2020 provided by Brazil's central bank available at <https://www.bcb.gov.br/en/currencyconversion>

⁹⁵ MRN, 2021 annual report, at 144. ("A Sociedade também detém o Benefício do Reinvestimento vinculado à SUDAM.") <https://www.mrn.com.br/images/relatorioadm/relatorio-demonstracoes-financeiras-2021.pdf>

⁹⁶ For general tax exemptions available in the Brazilian legal Amazon, see 'Incentivos fiscais', Superintendência do Desenvolvimento da Amazônia <https://www.gov.br/sudam/pt-br/assuntos/incentivos-fiscais>

⁹⁷ Section "about us." MRN. <https://www.mrn.com.br/index.php/en/who-we-are>. See also 'South32 Completes Acquisition of Additional Interest in Mineração Rio Do Norte.' South32. 2 May 2022, https://www.south32.net/docs/default-source/media-releases/south32-completes-acquisition-of-additional-interest-in-mrn.pdf?sfvrsn=a97948f2_4

⁹⁸ 'About Vale.' Vale. <http://www.vale.com/EN/aboutv ale/Pages/default.aspx>

⁹⁹ 'South32 Completes Acquisition of Additional Interest in Mineração Rio Do Norte.' South32. 2 May 2022.

¹⁰⁰ Norsk Hydro, 2021 annual report, at 83, footnote 1. <https://www.hydro.com/globalassets/06-investors/reports-and-presentations/annual-report/rdmar21/annual-report-2021-eng.pdf> See also *O extrativismo mineral na Amazônia brasileira no início do século XXI: valor, poder e enraizamento nas Redes Globais de Produção minero-siderúrgica e minero-metalúrgica do alumínio*. Alessandra Cardoso. PhD thesis. Universidade Estadual De Campinas. Instituto De Economía. At 263. See also 'Acordo entre Vale e a norueguesa Hydro cria gigante mundial do alumínio.' Norsk Hydro. <https://www.hydro.com/pt-BR/imprensa/noticias/2010/acordo-entre-vale-e-a-norueguesa-hydro-cria-gigante-mundial-do-aluminio/>; 'Hydro takes over Vale's aluminium business in transforming transaction.' Norsk Hydro. 2010. <https://www.hydro.com/en-BR/media/news/2010/hydro-takes-over-vales-aluminium-business-in-transforming-transaction/>

¹⁰¹ See Currency conversion. Brazilian Central Bank. <https://www.bcb.gov.br/en/currencyconversion>

¹⁰² See also *O extrativismo mineral na Amazônia brasileira no início do século XXI*. Cardoso. 2019, at 257.

¹⁰³ 'What is transfer pricing', Tax Justice Network. <https://taxjustice.net/faq/what-is-transfer-pricing/>

¹⁰⁴ MRN 2021 annual report, at 145. <https://www.mrn.com.br/images/relatorioadm/relatorio-demonstracoes-financeiras-2021.pdf>

¹⁰⁵ MRN's response to a draft of this report, signed by Guido Germani, MRN's CEO, 14 December 2022.

¹⁰⁶ Norsk Hydro, 2020 annual report, at 44. <https://www.hydro.com/globalasset/s/download-center/investor-downloads/ar20/annual-report-2020-new.pdf>

¹⁰⁷ *O extrativismo mineral na Amazônia brasileira no início do século XXI*. Cardoso. 2019, at 259.

¹⁰⁸ See Norsk Hydro, 2021 annual report, at 20. <https://www.hydro.com/globalassets/06-investors/reports-and-presentations/annual-report/rdmar21/annual-report-2021-eng.pdf> Norsk Hydro, 2020 annual report, at 44. <https://www.hydro.com/globalassets/download-center/investor-downloads/ar20/annual-report-2020-new.pdf> Norsk Hydro, 2019 annual report, at 39. <https://www.hydro.com/Document/Doc/Annual%20report%202019%20web.pdf?docId=506433> Norsk Hydro, 2018 annual report, at 37. <https://www.hydro.com/Document/Doc/2018%20Annual%20report.pdf?docId=8525>

¹⁰⁹ Norsk Hydro, 2021 annual report, at 222. <https://www.hydro.com/globalassets/06-investors/reports-and-presentations/annual-report/rdmar21/annual-report-2021-eng.pdf>

¹¹⁰ See 'Statutory Corporate Income tax rates, Non-OECD economies, Brasil.' OECD.

https://stats.oecd.org/Index.aspx?DataSetCode=CTS_CIT.

¹¹¹ Por que queremos o fim do sigilo fiscal dos gastos tributários: o caso empresa Hydro Alunorte. INESC. September 2018.

<https://www.inesc.org.br/por-que-queremos-o-fim-do-sigilo-fiscal-dos-gastos-tributarios-o-caso-empresa-hydro-alunorte/>

¹¹² Norsk Hydro, 2021 annual report, at 222.

<https://www.hydro.com/globalassets/06-investors/reports-and-presentations/annual-report/rdmar21/annual-report-2021-eng.pdf>

¹¹³ See 'Statutory Corporate Income tax rates, Non-OECD economies, Brasil.' OECD.

¹¹⁴ Norsk Hydro, 2021 annual report, at 182 (emphasis added).

<https://www.hydro.com/globalassets/06-investors/reports-and-presentations/annual-report/rdmar21/annual-report-2021-eng.pdf>

¹¹⁵ Norsk Hydro, 2020 annual report, at 120.

<https://www.hydro.com/globalassets/download-center/investor-downloads/ar20/annual-report-2020-new.pdf>

¹¹⁶ Ibid, at 25.

¹¹⁷ In Norsk Hydro's comments on a draft of this report, Hydro stated: "The ICMS deferral applicable to Hydro is intended to prevent the accumulation of ICMS credits to which it would be entitled by its operations, reducing state overall obligation to reimburse Hydro." It referred to Hydro's Annual Report 2021, page 182 for more information.

¹¹⁸ Alcoa, 2021 annual report, at 111.

[https://s29.q4cdn.com/945634774/files/doc_financials/2021/ar/2021-](https://s29.q4cdn.com/945634774/files/doc_financials/2021/ar/2021-efetivas-2018-serie-2016-a-2021-quadros/view)

[Alcoa_Annual-Report-Bookmarked-Final.pdf](https://s29.q4cdn.com/945634774/files/doc_financials/2021/ar/2021-efetivas-2018-serie-2016-a-2021-quadros/view)

¹¹⁹ Ibid.

¹²⁰ See 'Isencoes fiscais para-empresas na amazonia mais de 50 anos sem transparencia e efetividade.' INESC. 2019.

¹²¹ Demonstrativo dos Gastos Tributários Bases Efetivas 2015.' Série 2013 a 2018. At 151.

<https://www.gov.br/receitafederal/pt-br/centrais-de-conteudo/publicacoes/relatorios/renuncia/gastos-tributarios-bases-efetivas/dgt-bases-efetivas-2015-serie-2013-a-2018/@@download/file/ano-calendario-2015-serie-2013-a-2018.pdf.pdf>

¹²² 'Demonstrativo dos Gastos Tributários Bases Efetivas 2016.' Série 2014 a 2019 - Quadros. Receita Federal. Excel sheet QXXVII, row 133.

<https://www.gov.br/receitafederal/pt-br/centrais-de-conteudo/publicacoes/relatorios/renuncia/gastos-tributarios-bases-efetivas/dgt-bases-efetivas-2016-serie-2014-a-2019-quadros/view>

¹²³ 'Demonstrativo dos Gastos Tributários Bases Efetivas 2017.' Série 2015 a 2020 - Quadros. Receita Federal. Excel sheet QXXVII, row 134.

<https://www.gov.br/receitafederal/pt-br/centrais-de-conteudo/publicacoes/relatorios/renuncia/gastos-tributarios-bases-efetivas/dgt-bases-efetivas-2017-serie-2015-a-2020-quadros/view>

¹²⁴ 'Demonstrativo dos Gastos Tributários Bases Efetivas 2018.' Série 2016 a 2021 - Quadros. Receita Federal. Excel sheet QXXVII, row 131.

[https://www.gov.br/receitafederal/pt-br/centrais-de-conteudo/publicacoes/relatorios/renuncia/gastos-tributarios-bases-efetivas/dgt-bases-](https://www.gov.br/receitafederal/pt-br/centrais-de-conteudo/publicacoes/relatorios/renuncia/gastos-tributarios-bases-efetivas/dgt-bases-efetivas-2018-serie-2016-a-2021-quadros/view)

[efetivas-2018-serie-2016-a-2021-quadros/view](https://www.gov.br/receitafederal/pt-br/centrais-de-conteudo/publicacoes/relatorios/renuncia/gastos-tributarios-bases-efetivas/dgt-bases-efetivas-2018-serie-2016-a-2021-quadros/view)

¹²⁵ See 'Painel Dados Abertos da Matriz de Informações Sociais'. Ministério da Cidadania. [VIS DATA 3 beta \(mds.gov.br\)](https://visdata3beta.mds.gov.br)

¹²⁶ 'Currency Conversion. Banco Central do Brasil. <https://www.bcb.gov.br/en/currencyconversion>

¹²⁷ See 'Painel Dados Abertos da Matriz de Informações Sociais'. Ministério da Cidadania.

[http://aplicacoes.mds.gov.br/sagi-](http://aplicacoes.mds.gov.br/sagi-paineis/analise_dados_abertos/)

[paineis/analise_dados_abertos/](http://aplicacoes.mds.gov.br/sagi-paineis/analise_dados_abertos/) Adding up the totals for Rondônia, Acre, Amazonas, Roraima, Para, Amapa, Tocantins, Mato Gross, and Maranhao equals to 2,909,893 recipients of Bolsa Familia in average in 2018. For some of these states, not all municipalities are part of the Legal Amazon, but we did not find disaggregated data of Bolsa Familia recipients in the Legal Amazon.

¹²⁸ The Bolsa Familia is not a unique payment. It is comprised of a basic payment, to which there are additional payments per child, and as per disability. The average monthly payment per family recipient in 2018 was Brazilian Reals \$182.5. See 'Painel Dados Abertos da Matriz de Informações Sociais'. Ministério da Cidadania. [VIS DATA 3 beta \(mds.gov.br\)](https://visdata3beta.mds.gov.br) |

¹²⁹ *Household food insecurity in black-slaves descendant communities in Brazil: Has the legacy of slavery truly ended?* Gubert, M., Segall-Corrêa, A., Spaniol, A., Pedroso, J., Coelho, S., & Pérez-Escamilla, R. Public Health Nutrition 20(8), 1513-1522. 2017.

<https://pubmed.ncbi.nlm.nih.gov/27995820/>

¹³⁰ See 'Incentivos fiscais e gastos tributários: perspectivas para o novo governo.' INESC. May 2019.

¹³¹ *Use and Abuse of Tax Breaks: How Tax Incentives Become Harmful*. Alvic Padilla (lead author), Neeti Biyani, Suraj Jaiswal, Mae Buenaventura, Jared Maranga and Toby Quantrill. Christian Aid, Norad, Asian People's Movement on Debt and Development, CBGA and Tax Justice Network Africa. January 2020, at 16.

¹³² 'Brazil's trade balance.' CEIC Data.
<https://www.ceicdata.com/en/indicator/brazil/trade-balance>

¹³³ *Study of the aluminum production chain in northern Brazil*. Instituto Observatório Social. 2008. At 22 (referring to Alumar).
https://issuu.com/observatorio_social/docs/aluminio_eng *Análisis De Los Principales Proyectos Hidro-Energéticos en la Región Amazónica*. Philip M. Fearnside. Instituto Nacional de Pesquisas da Amazônia (INPA), 2014, at 35,
https://www.dar.org.pe/archivos/publicacion/147_Proyecto_hidro-energeticos.pdf Maurílio de Abreu Montero. Meio século de mineração industrial na Amazônia e suas implicações para o desenvolvimento regional. *Estudos Avançados*, São Paulo, v. 19, n. 53, p. 187-207, jan./abr. 2005, at 190. Disponível em:
<http://dx.doi.org/10.1590/S0103-40142005000100012>

¹³⁴ Hydro, 2021 annual report, at 20.
<https://www.hydro.com/globalassets/06-investors/reports-and-presentations/annual-report/rdmar21/annual-report-2021-eng.pdf>

¹³⁵ For an in-depth analysis of these impacts, see e.g., *Análisis De Los Principales Proyectos Hidro-Energéticos en la Región Amazónica*. Fearnside. Instituto Nacional de

Pesquisas da Amazônia. 2014, at 19-30.

¹³⁶ Vale news release, Vale informs on Mineracao Rio do Norte, 17 July 2019,
<https://www.vale.com/EN/about-vale/news/Pages/vale-informs-on-mineracao-rio-do-norte-mrn.aspx> See also **Vale informs that its subsidiary Mineração Rio do Norte (MRN) had been granted the Stability Condition Declarations (- Buscar con Google**. NOTE: In Vale's response to a draft of this report, it disputed its responsibilities in relation to these operations because it does not wholly own them, claiming that, "Vale does not have significant influence in the operating policy decisions of bauxite mining enterprises operating in the Amazon region. Despite not being controlled or operated by Vale, Vale manages its participation at MRN through governance agents appointed both in the Board of Directors and in the Advisory Committees provided for in MRN."

¹³⁷ See e.g., Rio Tinto, 2021 Annual report, at 280.
<https://www.riotinto.com/en/invest/reports/annual-report>

¹³⁸ Rio Tinto's response to a draft of this report sent in an email from Nina Mankovitz, Rio Tinto's Vice President Health, Safety, Environment and Communities, Aluminium, 15 December 2022.

¹³⁹ Norsk Hydro's comments on a draft of this report, sent in email by Eduardo Figueiredo, Norsk Hydro's Head of Sustainability and Social Impact, Bauxite & Alumina, 14 December 2022.

¹⁴⁰ See e.g., Linn Anker-Sørensen, Parental Liability for Externalities of Subsidiaries: Domestic and Extraterritorial Approaches, *Dovens Schmidt Quarterly* 102-118 (2014),

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2506508

¹⁴¹ United Nations. (2011). Guiding principles on business and human rights: Implementing the United Nations Protect, Respect and Remedy framework, Principles 13.b., 15.b, and 17.

¹⁴² Ibid, principles 13.b and 19.

¹⁴³ Ibid, principle 19.

¹⁴⁴ United Nations (2011), Guiding Principles on Business and Human Rights: Implementing the United Nations "Protect, Respect and Remedy" Framework, Commentary to Principle 19, at 22.

¹⁴⁵ See e.g., Rio Tinto, 2021 Annual report, p. 280.
<https://www.riotinto.com/en/invest/reports/annual-report>

¹⁴⁶ See Rio Tinto Human Rights Policy at [Human rights \(riotinto.com\)](https://www.riotinto.com/en/invest/reports/annual-report), South32 Human Rights Policy at [our-approach-to-human-rights-for-publication.pdf \(south32.net\)](https://www.south32.com/our-approach-to-human-rights-for-publication.pdf), Norsk Hydro Human Rights Policy at [hydros-human-rights-policy.pdf](https://www.norskhydro.com/hydros-human-rights-policy.pdf), and Alcoa Human Rights Policy at [EHS Standards Management \(alcoa.com\)](https://www.alcoa.com/ehs/standards/management). Rio Tinto has also committed to respect human rights and protect the environment in its code of conduct entitled "The Way We Work." See <https://www.google.com/url?sa=t&ct=j&q=&esrc=s&source=web&cd=&ved=2ahUKewjwLb4hPz7AhVkJzABHerCBxwQFnoECA8QAQ&url=http%3A%2F%2Fwww.riotinto.com%2F-%2Fmedia%2FContent%2FDocuments%2FSustainability%2FCorporate-policies%2FRT-The-way-we-work-EN.pdf&usq=AOvVaw0wVZGHaiAtFtQxjLL6jTm6>

¹⁴⁷ Hydro, 2021 annual report, at 94 (emphasis added).
<https://www.hydro.com/globalassets/06-investors/reports-and-presentations/annual-report/rdmar21/annual-report-2021-eng.pdf>

presentations/annual-report/rdmar21/annual-report-2021-eng.pdf See also Hydro, 2019 annual report, at 93. Hydro, 2018 annual report, at 89.

¹⁴⁸ Undermining Resilience. Christian Aid. Forthcoming.

¹⁴⁹ Climate Action Tracker, Brazil, 14 February 2022, at [Brazil | Climate Action Tracker](#).

¹⁵⁰ Ibid.

¹⁵¹ See e.g., Beate Sjøfjell, Andrew Johnston, Linn Anker-Sørensen and David Millon (2015), "Shareholder primacy: the main barrier to sustainable companies", in B. Sjøfjell and B.J. Richardson, *Company Law and Sustainability: Legal Barriers and Opportunities* (Cambridge University Press).

¹⁵² While we could not find data on how much the Oriximiná's municipality generated in taxes, fees and charges for the last ten years, we found that the total revenue for taxes, fees and charges forecasted in Oriximiná municipality's budget for 2021 was Brazilian Reals 36,880,350, which amounted to USD 7,096,879. See Oriximiná's municipal government, program of budget for 2021-consolidated, https://oriximina.pa.gov.br/arquivos/1090/ANEXOS%20LOA%20-%202021_002_2020_0000001.pdf So, we multiplied this amount for ten to make this estimate.

¹⁵³ See also INESC, <http://amazonia.inesc.org.br/materias/isencoes-fiscais-para-empresas-na-amazonia-mais-de-50-anos-sem-transparencia-e-efetividade/>

¹⁵⁴ The Bolsa Familia is not a unique payment. It is comprised of a basic payment, to which there are additional payments per child, and as per disability. The average monthly payment per family recipient in 2018 was Brazilian Reals \$182.5. See 'Painel Dados Abertos da Matriz de Informações Sociais'.

Ministério da Cidadania. [VIS DATA 3 beta \(mds.gov.br\)](#) |

¹⁵⁵ *Household food insecurity in black-slaves descendant communities in Brazil: Has the legacy of slavery truly ended?* Gubert et al. 2017.

¹⁵⁶ See similarly INESC, *Isenções Fiscais para Empresas na Amazônia: Mais De 50 Anos Sem Transparência e Efetividade*, 24 September 2018, <http://amazonia.inesc.org.br/materias/isencoes-fiscais-para-empresas-na-amazonia-mais-de-50-anos-sem-transparencia-e-efetividade/>

¹⁵⁷ See e.g., *Antes a água era cristalina, pura e sadia: percepções quilombolas e ribeirinhas dos impactos e riscos da mineração em Oriximiná, Pará*. Andrade. 2018. *Barragens de mineração na Amazônia*. Wanderley. 2021. *Floresta Nacional de Saracá-Taquera: a quem se destina?* Nepomuceno. 2021.

¹⁵⁸ See e.g., *Antes a água era cristalina, pura e sadia: percepções quilombolas e ribeirinhas dos impactos e riscos da mineração em Oriximiná, Pará*. Andrade. 2018, at 42-50. *Barragens de mineração na Amazônia*. Wanderley. 2021.

¹⁵⁹ *Barragens de mineração na Amazônia*. Wanderley. 2021. *Floresta Nacional de Saracá-Taquera: a quem se destina?* Nepomuceno. 2021.

¹⁶⁰ Supplementary Law No. 101, 4 May 2000, http://www.planalto.gov.br/ccivil_03/leis/LCP/Lcp101.htm

¹⁶¹ In Norsk Hydro's comments on a draft of this report, the company noted that that "it discloses information related to payments to governments and tax incentives as part of its Country-by-Country reporting, included in its annual reports". For Hydro's most recent report, they referred to [Hydro's Annual Report 2021](#), p. 180. They also

referred to [Hydro's Global Tax Policy](#)

¹⁶² *Barragens de mineração na Amazônia*. Wanderley. 2021.

¹⁶³ The information on MRN's bauxite sales to non-related parties is as follows: In 2019, these were 0.36% of MRN's bauxite sales. In 2018, these sales were 2.73% of MRN's bauxite sales. In 2017, these sales were 2.58% of MRN's bauxite sales. In 2016, these sales were 3.12% of MRN's bauxite sales. In 2015, these sales were 1.21% of MRN's bauxite sales. In 2014, these sales were 1.24% of MRN's bauxite sales. In 2013, these sales were 1.54% of MRN's bauxite sales.

¹⁶⁴ Demonstrativo dos Gastos Tributários Bases Efetivas 2015.' Série 2013 a 2018. At 84.

<https://www.gov.br/receitafederal/pt-br/centrais-de-conteudo/publicacoes/relatorios/renuncia/gastos-tributarios-bases-efetivas/dgt-bases-efetivas-2015-serie-2013-a-2018/@download/file/ano-calendario-2015-serie-2013-a-2018.pdf.pdf>

¹⁶⁵ 'Demonstrativo dos Gastos Tributários Bases Efetivas 2016.' Série 2014 a 2019 - Quadros. Receita Federal. Excel sheet QVII, row 72.

<https://www.gov.br/receitafederal/pt-br/centrais-de-conteudo/publicacoes/relatorios/renuncia/gastos-tributarios-bases-efetivas/dgt-bases-efetivas-2016-serie-2014-a-2019-quadros/view>

¹⁶⁶ 'Demonstrativo dos Gastos Tributários Bases Efetivas 2017.' Série 2015 to 2020 - Quadros. Receita Federal. Excel sheet QVII, row 71.

<https://www.gov.br/receitafederal/pt-br/centrais-de-conteudo/publicacoes/relatorios/renuncia/gastos-tributarios-bases-efetivas/dgt-bases-efetivas-2017-serie-2015-a-2020-quadros/view>

¹⁶⁷ 'Demonstrativo dos Gastos Tributários Bases Efetivas 2018.' Série 2016 a 2021 - Quadros. Receita Federal. Excel sheet QVII, row 66.

[https://www.gov.br/receitafederal/pt-br/centrais-de-conteudo/publicacoes/relatorios/renuncia/gastos-tributarios-bases-efetivas/dgt-bases-](https://www.gov.br/receitafederal/pt-br/centrais-de-conteudo/publicacoes/relatorios/renuncia/gastos-tributarios-bases-efetivas/dgt-bases-efetivas-2018-serie-2016-a-2021-quadros/view)

[efetivas-2018-serie-2016-a-2021-quadros/view](https://www.gov.br/receitafederal/pt-br/centrais-de-conteudo/publicacoes/relatorios/renuncia/gastos-tributarios-bases-efetivas-2018-serie-2016-a-2021-quadros/view)