Landscape Protection Plan of Marfrig

11 September 2020

Disclaimer:

The numbers represented in this plan are derived from 2019 and various historical sources. Numbers are indicative and local environment relative to 2019 year's context and may therefore change over time.

1. Table of Contents

2. Executive summary

Marfrig is the second largest protein producer in the world (with a presence across Latin America and in the U.S.), as well as in Brazil. Situated between the cattle rancher and the consumer-facing retailer within the value chain, Marfrig's direct suppliers include fully integrated cattle ranchers and finishing cattle farms. The company's indirect suppliers include rearing farmers and calf producers. In 2019, Marfrig's primary processing capacity in Brazil was on average approximately 16,000 animals/day, and its products were sold to predominantly national but also to international markets.

Cattle ranching has historically been perceived as the sector with the greatest impact on Brazilian forest loss. Responding to the growing environmental concerns internationally and domestically, Marfrig's ambition over the last ten years has been to incrementally de-couple its products from deforestation. Since 2009 and following on agreements with Greenpeace and subsequently with the Brazilian government, Brazil's major meatpackers (including Marfrig), have been working on strengthening their cattle procurement procedures to reduce environmental and social risks from their supply chains. While government and private sector efforts have supported an impressive decline in Brazilian Amazon deforestation trends throughout these years, cattle ranching activities are still perceived to be at the centre of deforestation. Deforestation rates in the Brazilian Amazon have in fact risen since 2012, and even more significantly since 2018.
From the perspective of corporate risk management, the agreements with Greenpeace and the Federal Public Prosecutor have been instrumental for strengthening compliance mechanisms within the beef supply chain, as signatory companies reported ninety-nine to one hundred percent compliance with the agreement in 2017. However, despite these achievements it is difficult to quantify the contribution made to the decline in deforestation rate in the Amazon. Traceability to date has only been extended to direct suppliers, and not to those raising and rearing calves. Cattle ranchers are still circumventing these measures by trading cattle through intermediaries (the so called 'white washing') or from selling cattle to slaughterhouses that are not yet signatories to these agreements (a phenomenon commonly referred to as 'leakage'). Overall, and coupled with other limiting

factors, the scope and implementation of control measures applied by companies today does not homogenously reach a large enough share of the market to eliminate the issue of deforestation from the cattle sector.

In 2019, Marfrig issued a USD 500 million sustainable transition bond to raise capital earmarked for buying beef from suppliers in the Amazon biome that can demonstrate that no deforestation has taken place on their farms. In July 2020, Marfrig, in partnership with IDH The Sustainable Trade Initiative, launched the Marfrig Verde+ Plan, which aims to ensure that 100% of the company's production chain is sustainable and deforestation-free within ten years. Completely eliminating deforestation throughout the supply chain is a novelty for the sector, as so far, no other player in the Brazilian beef industry has attempted to do so. What distinguishes Marfrig's commitments from those made to date is the company's ambition to guarantee the implementation of its zero-deforestation commitment throughout the entire chain. Additionally, Marfrig's conviction is that for such change to become systemic, the company should not limit itself to excluding those ranchers involved in deforestation from its supply chain (partially due to the issue of leakage mentioned above). The company intends to bring the non-compliant suppliers on a pathway towards more sustainable production models. Besides deepening its traceability systems and strengthening 'purchase and compliance' mechanisms, the company believes that for change to happen, it needs to be channelled through a process of inclusion, continuous improvement, ultimately leading to compliance for these suppliers.

Marfrig's sustainable transition bond and Verde+ Plan are the basis for &Green's investment rationale. In line with Marfrig's targets, &Green's funding objective is to deepen the reach of Marfrig's zero deforestation commitment to encompass the entire supply chain, including indirect producers. Based on transaction's associated environmental covenants (environmental and social action plan and Landscape Protection Plan), Marfrig is committed to achieving a deforestation-free supply chain in the Amazon biome by 2028, and by 2030 in the Cerrado biome. By using a risk calibrated approach, Marfrig commits to trace 100% of the cattle it purchases to the farm of origin by 2025. Controlling the cattle's origin will enable Marfrig to apply legal and environmental and social related criteria, as well as compliance protocols related to its indirect suppliers, to mitigate key risks. Mapping the origin of cattle will also provide the means to understand suppliers' needs and promote technical assistance mechanisms to build their capacity and incentivise compliance. Lastly, Marfrig commits to transparently report on its progress against the commitments made and to disseminate best practices and lessons learnt for the benefit of the sector's overall transition to deforestation-free production.

The effectiveness of these interventions in addressing the risks are still to be proven but if successful, they have the potential of bringing about market transformation in the Brazilian sector and serve as proof of concept for the meat industry. &Green's mission is to operate in spaces where there is additional perceived risk of financing sustainable production and to provide risk capital to new systems that have the potential to decouple production from deforestation. Marfrig is partnering with &Green to increase its sustainability budget and invest in upstream supply chain interventions that will help reach both direct and indirect suppliers and build the operating systems.

To demonstrate that Marfrig can deliver inclusive, sustainable and deforestation-free production within the area it operates (the "Landscape") whilst including local producers, local government and civil society, &Green requires the development of a landscape approach and a Landscape Protection Plan. Marfrig's Landscape Protection Plan, described in this document, is the reflection of Marfrig's Verde+ plan and of the Environmental & Social Action Plan agreed with &Green. &Green assesses its transaction with respect to its potential for generating Environmental Return and monitors its achievements through a suitable set of transparent KPIs. This transaction's Environmental Returns are the sum of (a) results of Marfrig's actions with its direct suppliers, and (b) the potential results of the programs Marfrig is supporting to reach indirect suppliers.

ER 1: Conserved forest	ER 2: Land sustainably intensified	ER 3: Forest restored	SI: Smallholder farmers benefiting
1,254,000 ha	7,000 ha	6,000 ha	157 smallholders

The following sections 4-5 will clarify the project and geographical boundaries of the Landscape Protection Plan (further set out in section 4) and depict the land use categories, deforestation pressures and business as usual

scenario from the perspective of meatpacker companies like Marfrig (section 5);. Section 6 will describe Marfrig's Verde+ plan, section 7 will clarify the milestones of the plan and section 8 will inform on Marfrig's MRV (Monitoring Reporting and Verification) strategy to publicly report on progress. Annex 1 of the document describes the environmental returns and social inclusion targets of the transaction.

3. Definitions

Landscape Protection Plan: a sustainable land-use and management plan, which sets out how positive environmental and social impact will be generated during the financing period within the landscape or project area from which the &Green fund considers its Environmental Return and Social Inclusion to be derived.

Forest Code: refers to the law N. 12.651 from, 25 May 2012 established at national level, requires land owners to set aside Protection Areas—riparian areas, around lakes, hilltops, steep slopes (Area de Preservação Permanente – APP) and a percentage of the property as a legal reserve (Reserva Legal – RL). Additionally, we refer to law N. 27136, 1 Nov 2017, of the state of Mato Grosso for complimentary state level guidance and definitions.

Cadastre Ambiental Rural (CAR): public registry with data on rural properties and their compliance with the environmental requirements of the Forest Code. All rural landholders in Brazil are obliged to register their properties in the Rural Environmental Registry (CAR).

Forest Conserved: following the &Green KPI framework – Forest Conserved is measured through the public database of the Rural Environmental Registry System (Sicar), and the spatial information related to the polygon of each property, among them the information called "área de reserve legal" and also other information called "remanescente de vegetação nativa".

The Geospatial Monitoring System: the system with which Marfrig periodically screens suppliers for eligibility by juxtaposition of images/maps (Prodes, Farm's polygones, roads, rivers, vegetation) and against key sourcing requirements: supplier assurance letter, blacklist of the Brazilian Institute of the Environment and Renewable Natural Resources (IBAMA), blacklist of the Ministry of Labor and Employment (MTE), registration at the National Institute of Rural Settlement and Agrarian Reform (INCRA), GPS coordinates, CAR registry, Marfrig club and SA8000 random sampling). The status of registered farms is updated every day.

Approved Supplier: a rancher listed in the "Geospatial Monitoring System" of Marfrig for the Amazon Biome in the MT state and that is compliant to all Marfrig 2019 sourcing requirements.

Approved supplier list: The sum of all Approved Suppliers listed in the Geospatial Monitoring System.

Land sustainably intensified: unproductive and/or degraded pastureland that has been regenerated via improvements of soil quality (pasture reform), leading to an increase yield-per-hectare, with the intention to increase the yield per hectare and thereby reduce pressure to open new forest areas.

Forest restored: degraded forest areas or agricultural areas where forest is restored, according to the legal requirements established by the Forest Code and State laws.

Smallholders: viable small-scale producers that result from the program. Smallholder are defined as per the Brazilian legal definition (less than 4 fiscal modules of land) and as a family run farming business.

Biomes: clusters of ecosystems, gathered in terms of similarities in their vegetation, terrain and climate. In Brazil, the Ministry of the Environment works with six biomes: The Amazon, the Cerrado, the Caatinga, the Pantanal, the Atlantic Forest, the Pampa. Amazon biome as defined by the Brazilian Institute of Geography and Statistics (IBGE), its definitions and biome maps.[1]

[1] Based on the IBGE website source: https://www.ibge.gov.br/en/geosciences/environmental-information/18341-biomes.html?=&t=sobre.

Deforestation: any conversion by suppression of areas of primary forest physiognomy by anthropogenic actions of 6,25 ha contiguous ha or more (as per the National Institute for Space Research in Brazil - INPE).[2]

Deforestation free: Marfrig can demonstrate through third party audits that cattle in Marfrig's supply chain is in compliance with the Marfrig P&C criteria, or if incompliant that Marfrig has taken action to redress the incompliance or block the supplier in accordance with the compliance protocol (to be approved by &Green). An overall margin of 5% non-compliance is considered acceptable.

Origin Control: the mechanisms adopted by the company to track the origin at farm level of the cattle from the breeding to the slaughterhouses. These mechanisms can include individual traceability (ear-tags, chip, etc.), block-chain technologies, landscape monitoring, among others, that are selected according to the risk level of each region and to the commercial conditions for clients. The main elements covered by the Origin Control includes biodiversity conservation, deforestation-free supply chain, working conditions, indigenous lands, among other criteria.

Legal Compliance: compliance with the Brazilian Forest Code (2012)—the key requirements are understood to be: no overlap with Conservation Areas or Indigenous Land; no embargoes from IBAMA; not listed on the Slave Labour List of the Ministry of Labour; CAR registration has been submitted. The legal compliance check is based on public information published by public bodies (environmental and labour federal authorities).

P&C Criteria Compliance: compliance by each rancher supplying to Marfrig, after having been assessed against the P&C criteria before each transaction and after having been listed as compliant based on the compliance protocol. An overall margin of 5% non-compliance is considered acceptable.

Supply chain: any farm through which cattle purchased by Marfrig have passed during their lifetime. Tier 1 –direct suppliers that delivers the cattle to the slaughterhouses (all of them has the fattening stage and can cover also the rearing and breeding states in some cases); Tier 2 – usually the rearing stage (in some cases can also conduct the breeding stage); Tier 3 – usually conducts only the breeding stage. Should cattle be traded between different rearing farms, they will all qualify as Tier 2. Should cattle be traded between different breeding farmers, they will all qualify as Tier 3.

4. Defining the landscape boundaries of Marfrig's interventions

The focus of &Green's transaction is on the company's effort to enforce a zero-deforestation commitment on its supply chain, which includes direct and indirect suppliers. The company's influence on land use (and forest protection) is reflected by the actions and degree of control that Marfrig will have on its suppliers. The Landscape Protection Plan's geographical scope is therefore defined by Marfrig's suppliers' location in both Amazon and Cerrado biomes (whereby the primary impact is motivated by actions within the Amazon biome, and additional impact is generated through interventions within the Cerrado biome).
Marfrig operates eleven slaughter units, three processing units and seven distribution centres, spread across 6 states in Brazil. Suppliers located in the Amazon Biome of the Mato Grosso state represent a prominent share of

Marfrig's total supply. Marfrig's slaughtering capacity in Brazil is approximately 2.7 million cattle heads per year, of which approximately 39% are sourced in the Amazon Biome.

[2] The definition of deforestation follows the technical specifications of the PRODES systems on which Marfrig's geo-monitoring tool is based on, whereby the measurement of deforestation considers at a minimum an area of 6.25 of land cleared (through complete removal of primary forest cover). Source: http://www.obt.inpe.br/OBT/assuntos/programas/amazonia/prodes/pdfs/Metodologia_Prodes_Deter_revisada.pdf.

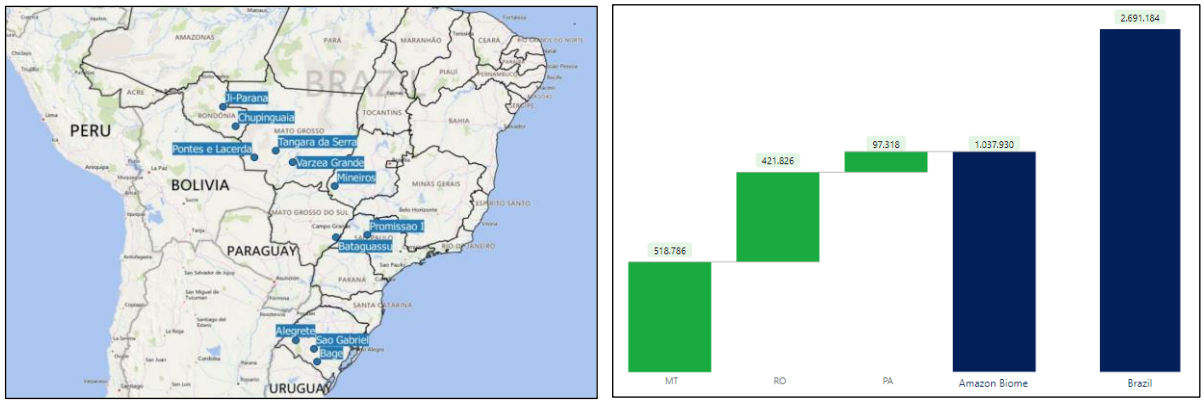

Figure 1: Map of Marfrig's slaughtering plants in Brazil (left) and Marfrig cattle sourcing by region in Brazil in 2019 (right). Source: Marfrig.

Looking at the supply base located within the Amazon Biome—until 2019, Marfrig had purchased cattle from three key states: Para, Rondônia and Mato Grosso. The latter accounted for its largest base (50% of all the cattle purchased in 2019). Rondônia accounted for forty percent and Pará accounted for less than nine percent. A total of approximately 15,000 direct suppliers were registered in the Amazon Biome, out of which some 7,000 in the Mato Grosso state. Today, Marfrig no longer operates in Pará, as the operations in Tucumá closed in March 2020. Amazon Biome-based suppliers are currently concentrated in Mato Grosso and Rondônia.

Marfrig Brazil: Brazil total slaughter per biome in number of heads and %		
Amazon Biome	1,037,930	39%
Cerrado Biome	1,145,656	43%
Mata Atlantica	228,845	8%
Pampa	234,832	9%
Pantanal	43,921	1%
Total	**2,691,184**	**100%**
Marfrig Amazon Biome supply base by state, in number of heads		
Mato Grosso	518,786	50%
Rondônia	421,826	40,7%
Pará	97,318	9,3%
Total	**1,037,930**	**100%**

Figure 2: Marfrig slaughter capacity and supply base by state in 2019. Source: Marfrig.

Rampant deforestation of the Amazon has led to a high level of awareness of the negative impacts related to the cattle sector and its supply chains. The ever-increasing attention begs for immediate action to be taken on Marfrig's Amazon Biome supply base. Yet, the company also recognizes that there is a high risk of deforestation beyond the Amazon Biome, and in other key biodiversity areas (such as the Cerrado Biome). Marfrig is committed to engage and enlarge its monitoring framework to cover its entire supply chain. Its Verde+ plan, covers therefore both the Cerrado and Amazon Biomes in the Legal Amazon states.[3] As a starting point, Marfrig is to develop its approach for all Amazon Biome states, while working towards testing its monitoring tools in 2021 for the Cerrado.

5. Current land use and deforestation drivers in Mato Grosso state and business as usual scenario of meatpackers in Brazil.

5.1. Land use and environmental governance.

The state of Mato Grosso is the Brazil's third largest state in terms of area (90 million hectares of land, or about the same as France and Germany combined). 18.7% of Mato Grosso is recognised as public land, and the

[3] Legal Amazonia includes a total of seven states (Acré, Amapá, Amazonas, Pará, Rondõnia, Roraima and Tocantins) and parts of two other states (Maranhão and a very small part of Goiás State.

remaining 81.3% is considered privately owned. Conservation units and indigenous lands make up 17 million ha within the state, namely 19% of the total state area (Conservation units make up 2 million ha, while indigenous lands make up 15 million ha).[4]

Today, Mato Grosso is perceived as a global powerhouse for soy and beef production. Land use, especially within privately owned land, is primarily agricultural. Over 50% of the state's GDP is related to the agri-sector. As illustrated by figure 3, industries that have flourished over the last twenty years, and which utilise most of the arable land, are cattle, soy and cotton.[5]

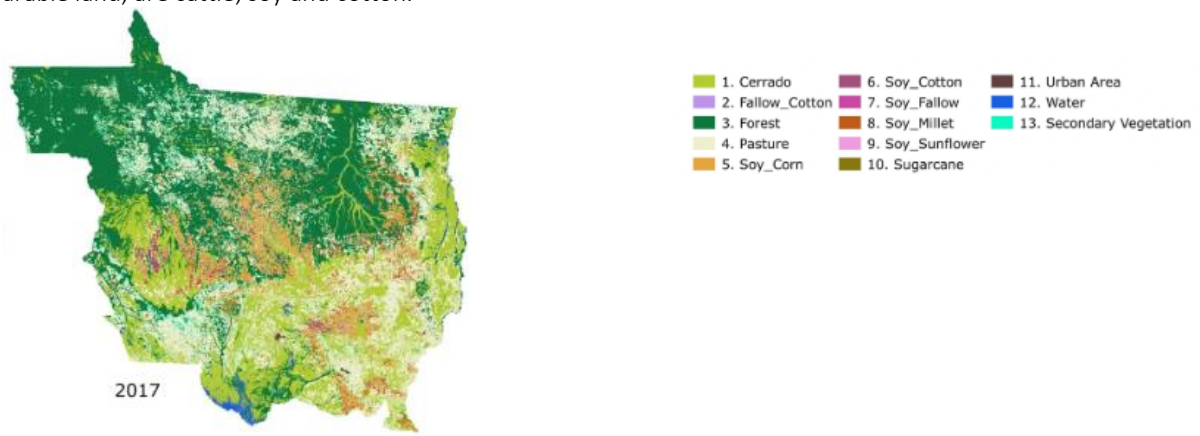

Figure 3: Land use in Mato Grosso from 2001 to 2017. Source, Simoes, R., Picoli, M.C.A., Camara, G. et al. Land use and cover maps for Mato Grosso State in Brazil from 2001 to 2017. Sci Data 7, 34 (2020).

Cattle ranching is the land use activity that occupies the largest area in Brazil. Mato Grosso has the biggest herd size in the country: in 2018, it accounted for approximately 30 million heads, representing 14% of the total herd size of Brazil, and largest area under pasture, with approximately 22 million hectares registered as pasture/cattle farms in 2017, for a total of 93,000 farmers.[6] Crop land (such as for soy), is 60% smaller comparative to pasture areas in the state (8 million hectares).[7]

From an ecological perspective, more than 64% of the Mato Grosso state's area is covered in forest and related native vegetation, giving it the quality of a biodiversity hotspot spanning over three biomes: Amazon (47,7 million hectares), Cerrado (36 million hectares) and Pantanal (6,3 million hectares).[8] Private landowners hold significant responsibility in terms of forest protection. Out of the 58 million hectares of protected forest (excluding forest used for productive uses), around 70% is preserved within private properties.

Forest conserved within each land use categories	Area	%
Protected vegetation in conservation units	2.234.913	2,47 %
Protected vegetation in indigenous land	14.963.713	16,57 %
Protected vegetation in real estate not registered (CAR)	10.660.576	11,80 %
Protected vegetation in registered rural properties (CAR)	30.636.430	33,92 %
Natural Pastures	2.736.308	3,03 %
Planted pastures	19.436.010	21,52 %
Plants and planted forest	9.385.030	10,39 %
Urban areas and other	266.829	0,30 %
Total area	**90.319.809**	**100 %**

Figure 4. Forest attribution by land use types and occupancy. Source: Embrapa[9]

[4] https://www.cnpm.embrapa.br/projetos/car/estados/MT/ATRIBUICAO_USO_OCUPACAO_MT_APRESENTADO_EVENTO_SOJA_Website.pdf
[5] https://www.businessinsider.com/brazil-agriculture-boom-mato-grosso-2012-12?international=true&r=US&IR=T#brazil-is-in-the-top-5-worldwide-for-most-major-crops-and-is-now-the-fourth-largest-grains-producer-in-the-world-4
[6] Source: Beef report summary report 2019
[7] https://www.idhsustainabletrade.com/landscapes/mato-grosso-brazil/
[8] http://www.sema.mt.gov.br/attachments/article/90/Dados%20de%20desmatamento%20por%20bioma%20ate%202017.pdf
[9] https://www.cnpm.embrapa.br/projetos/car/estados/MT/ATRIBUICAO_USO_OCUPACAO_MT_APRESENTADO_EVENTO_SOJA_Website.pdf

Collaboration with the public sector, incentives and legislative regulation is key to framing the role of the private sector as an agent of forest conservation in Brazil. The legal standard regarding deforestation can be considered high in Mato Grosso, based on a combination of federal Forest Code requirements and additional commitments of the state government through the PCI institute (see text box 1). The Brazilian Forest Code, reformed in 2012, requires land owners to set aside Protection Areas — riparian areas, around lakes, hilltops, steep slopes (Area de Preservação Permanente – APP) and a percentage of the property as a legal reserve (Reserva Legal – RL). The percentage of the Legal Reserve varies from 20% in Cerrado to 80% in Amazon Forest areas. During the Forest Code reform in 2012, it was decided to tackle historically widespread incompliance by providing a certain level of amnesty (primarily for fines, not or only partially for the requirement to restore) to farms with illegal deforestation prior to 2008, and to focus investments and efforts on reforestation of these areas. Important mechanisms of the Forest Code are the Rural Environmental Cadastre (CAR) where all properties register with geospatial information, which is subsequently validated by the each State Environmental Agency (SEMA); and the Environmental Compliance Program (PRA), which is the mechanism through which the government encourages, enforces and monitors compliance with the Forest Code. In case of non-compliance, farmers must restore their APPs according to the specifications of the Forest Code. For Legal Reserves, the Forest Code allows for restoration of the area through an approved restoration plan to be completed by 2036; or for compensation through purchase or lease of excess natural forest in the same biome for protection or through the purchase of Environmental Reserve Quotas.

Box 1: The PCI Strategy

Mato Grosso has a defined Strategy, built in a participatory way, and monitored, of sustainable development for its rural landscape. The PCI Strategy is a jurisdictional approach to sustainable rural development, which brings together public, private and third sector actors around long-term goals in its three axes: Produce, Conserve and Include. It was created from the movement of society in Mato Grosso, and presented at COP21 in Paris, in December 2015. The PCI Institute was founded in March 2019 as an evolution of the governance model established for the PCI Strategy and the State government determines that the Institute is the formal private partner to implement PCI Strategy. Marfrig is one of the 8 founding organizations of the PCI Institute and has an active role in its governance structure.

Overall, the Forest Code is widely regarded as a strong basis for protection of Brazil's remaining forest, while not undermining the strength of the Brazilian agricultural sector. Reputable NGOs like IDH, WWF and TNC support the implementation of the Forest Code.

5.2. Understanding the deforestation drivers in the Landscape Area.

Mato Grosso has featured high levels of deforestation in the 1990s and early 2000s. The state ranks second highest (after Pará state) in terms of level of deforestation in the nine states of the Amazon basin (i.e. Acre, Amapá, Amazonas, Pará, Rondônia, Roraima, Tocantins) with 1,449.50 km^2 deforested in 2018, accounting for 20% of the total deforestation in the region. Of that, 1,363.3 km^2 was in the Amazon Biome. Between 2004 and 2012, Amazon deforestation rates dropped dramatically, but despite that, the deforestation trend has been steadily rising again since 2012 (see figure 5).

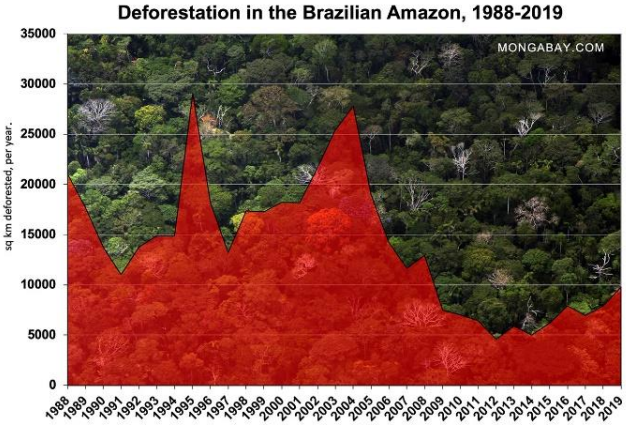

Figure 5: Deforestation rates in Legal Amazon states, including 2019. Source: Mongabay, April 2020.

Agricultural expansion has historically taken place through clearing of forests, for large-scale commercial agriculture, since the government offered land occupation and incentives for its colonization, in the 1970's and 1980's. The conversion of forests to pastures and subsequently to cropland is the major driver of deforestation. This is especially true in the Brazilian Amazon, where 70% of deforested land is under pasture.[10] In the Amazon region, pastures accounted for nearly 80% of deforested land from 1996 to 2006.[11]

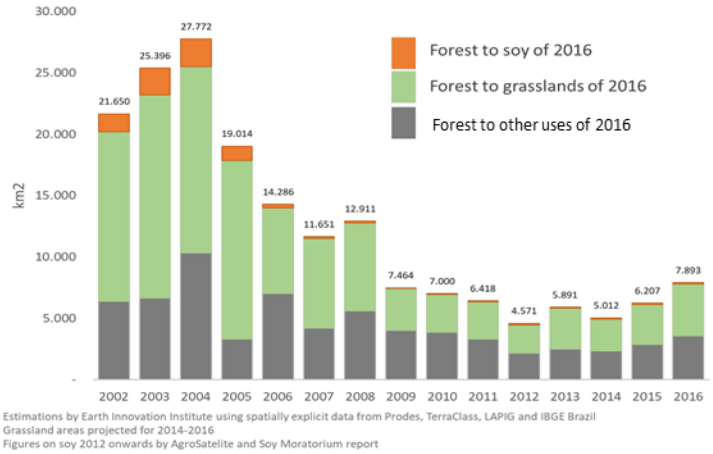

Figure 6: Total Annual Deforestation in the Brazilian Amazon Region and Allocation of Newly Cleared Land by Use—Soy Cultivation, Livestock Grazing, and Other. Source: EII

In the land conversion dynamic, cattle ranching is typically the first economically activity taking place after land conversion. Clearing forest with fires and running grass-fed cattle on the created pastures requires little investment besides the purchase of the animals. This makes it an economic activity accessible to many. In addition, cattle ranching establishes the 'productive land use' which Brazilian law requires for land-titling.[12] Where soil is fertile, cattle pastures often get replaced with higher margin soy cultivation. Often land is cleared and occupied with cattle in anticipation of the margin that can be made by, later on, selling to incoming soy farmers.

As a result of this dynamic, cattle ranches make up for 22 million hectares of pastureland in the state, larger than any other land use. And of this area, around two thirds (fifty percent of which are in the Amazon), are unproductive or degraded, because restoration of degraded pasture requires higher investments, for which many cattle farmers do not have the means.
While there is enough cleared land in the Amazon to sustain an expansion of production, production costs reveal that the highest cost of production corresponds to the restoration of degraded pastures and is therefore rarely undertaken by farm holders (refer to text box 2 for more details).

Box 2: Sustaining livestock and agricultural expansion by utilizing already cleared land.
There are 7 million ha of excess forest, which could be legally deforested on farms in MT. At the same time there are 15 million ha of degraded land (mostly degraded pasture) that would be able to be converted into agriculture. Capacity of pastureland in Brazil has reached only one-third of its potential (source: PCI, 2020). An increase to 52 percent would likely meet projected increases in demand for Brazilian beef and other agricultural products for the coming 20 years.

From a legal standpoint, a 2017 study of the Brazilian Environmental Research Institute (PNAS) further claims that: "Our results suggest that, from the landowner's perspective, full compliance with the Forest Code offers few economic benefits. Achieving zero illegal deforestation in this context would require the private sector to include full compliance as a market criterion, while state and federal governments develop the de facto enforcement mechanisms."[13]

[10] LEAVE, 2018
[11] Climate focus 2018 paper, p.22).
[12] Land speculation by creating cattle pasture to secure land titles for land claims. Land can be cleared, including forest, and cattle pasture planted, to demonstrate to the government that the area is productively used (productive land use is a requirement for land titling in Brazil. *LEAVES, 2018*
[13] Limits of Brazil's Forest Code as a means to end illegal deforestation; Azevedo, A. et al.; p.4; May 2017; http://www.pnas.org/content/pnas/early/2017/06/27/1604768114.full.pdf

Beyond illegal deforestation, ending all deforestation in the Brazilian Amazon would mean going beyond legal compliance with the Forest Code—a decision not to deforest left at the personal level of the landowners. Factors such as the ease of reaching compliance and the lack of positive incentives for farmers who waive their rights to legally clear forests are creating additional hesitations. A property owner's decision to deforest illegally is therefore the result of considering the economic advantage and the punishment risk (deterrence value). For cattle ranching in the Brazilian Amazon, the economic advantage value was calculated to be R$ 3,000[14], while the deterrence value was R$ 38.54.[15]

5.3. Business as usual of slaughterhouses

The cattle sector in brazil presents itself as the least organized supply chain within the animal protein agribusiness market.[16] The set of agents ranges from highly capitalized ranchers to smallholders, slaughterhouses with high technological standards (capable of meeting a substantial external demand) to slaughterhouses that hardly meet sanitary requirements. In terms of numbers—around 92,000 individual ranches are currently estimated to operate within the Mato Grosso State.[17] As we move downstream, the number of players diminishes significantly. While there is relatively little evidence on the number of slaughterhouses in the market today, a 2019 research source estimates that in 2012, 72 plants operated in 2016 through 52 holding companies in Mato Grosso[18]. Around 50% to 80%t of the market share is concentrated in the five largest meatpackers (including Marfrig) based on 2016 data.[19] The remaining share of slaughterhouses comprises smaller, independent actors, typically operating very locally and informally.
The presence of different cattle business models leads to structural problems at sector level, especially in the areas of genetics, nutrition, health management, agro-industrial processes, government action and segmented product marketing.
In addition to its heterogeneity, the value chain is characterized by opportunism in negotiations and by a lack of coordination between its different segments. The diversity of breeds, technological routes and production and handling systems results in very different products, with great variation in quality.
Lastly, the competitiveness of the Brazilian beef industry, was until recently largely driven by the advantages of production costs, based on the country's abundant natural resources and on relatively fewer environmental restrictions. Today, the aspects mentioned above, together with factors such as technology management, traceability, and certification of environmental and health issues, directly influence the Brazilian competitive position globally.

In 2009, Greenpeace and Marfrig (as well as two other major meatpackers), signed a multilateral agreement (G3), aiming at addressing deforestation and other environmental and social risks through supply chain approaches by excluding ranchers who engage in deforestation, forced labour, and encroachment on indigenous and protected areas in the Amazon Biome. An important impetus for the effectiveness of the agreement was the legal action taken by the Federal Prosecutors office (Ministério Público Federal, thereafter, "MPF") which established an Agreement Adjustment Term (TAC) with the processors, obligating them to exclusively purchase cattle from farms registered in the CAR registry, that do not demonstrate illegal deforestation and forced labour, or invasion public or traditional communities' lands (Ministerio Publico Federal 2013a, 2013b).[20] The TAC is a legal commitment made towards the prosecutor, whereby non-compliance to the agreed purchasing protocols authorizes the MPF to set sanctions without court intervention. In 2018, 50% of active meatpacking plants, responsible for 70% of the slaughter capacity were signatories.[21]
To guarantee conformity to their commitments, signatories (e.g. processors and meatpackers), such as Marfrig, must carry out third party audits, to verify they are not buying from illegitimate suppliers. Such audits are provided annually to the MPF, who supervises compliance.

[14] https://www.profor.info/sites/profor.info/files/Beef_Case%20study_LEAVES_2018.pdf
[15] Leaves, 2018
[16] http://www.emater.tche.br/site/arquivos_pdf/teses/Mono_Rafael_Gomes.pdf
[17] ABIEC 2017, from leaves
[18] Vale P, Gibbs H, Vale R, Munger J, Brandão A, Jr, Christie M, et al. (2019)
[19] Leaves, 2018
[20] The Federal Public Ministry (MPF) acts, through public prosecutors, covering the Federal Court of first instance in the State. It also acts out of court through administrative measures such as Recommendations and Conduct Adjustment Terms ("TAC").
[21] Leaves, 2018

TAC and G3 Commitments from signatories' meatpackers	
Buy from suppliers registered in the Rural environmental Registry	Free of deforestation related embargoes (IBAMA)
Not located in protected or indigenous areas	No-deforestation post-2009 (G3)
Not on Ministry of Labour list of work analogous to slavery	No illegal deforestation as defined in Brazilian forest code (MPF TAC)

Figure 7: Commitments under G3 and TAC's sustainability agreements.

Research suggests that the implementation of the G3 and TAC commitments by the largest meatpackers since 2009, has had a strong effect on ranchers' behaviour (albeit not the only one), especially with regards to registration rate of the rural environmental register (CAR). Only 2% of the suppliers were registered in 2006, whilst 96% were registered in 2013.[22] However, despite these achievements, it is difficult to quantify the contribution made to the decline in deforestation rate in the Brazilian Amazon, mostly because the scope and implementation of control measures applied by companies does not reach a large enough share of the market and in a homogenous way. The stronger limiting factors are discussed subsequently as they become key considerations for any meatpacker that seeks to bring about change.

Firstly, the initiatives for cattle supply chain monitoring have so far focused on the direct relationships, covering the fattening stage in the last three to twelve months before slaughter. The supply chain is fragmented, informal such that traceability all the way to the cattle breeder is not yet established at industry level. Of the total herd in Mato Grosso, approximately 31% comes from indirect suppliers (ranches that sell to other ranches and do not supply directly to the slaughterhouse).[23] A cow could in fact spend as much as 75% of its lifespan on a farm that is technically an indirect supplier of Marfrig. Tracing the cow beyond their direct suppliers, given the relatively long period during which cattle is moved from indirect to direct suppliers, is currently a challenge. Additionally, the monitoring systems have originally been developed in a proprietary way by each meatpacker. While they all aim to fulfil the same G3 commitments—they present differences in their model and implementation. Although the consequence is not as trivial as the rest, the lack of uniformity in terms of criteria and enforcement complicates meatpackers' effectiveness towards the market.

Secondly, the lack of a clear definition of the G3 scope opens the door to the so-called 'white-washing' trading activities. Cattle commonly moves between various locations during its lifespan and may be raised on recently deforested pastures before moving to compliant ranches. Cattle sold to direct suppliers can come from various farmers and farming segments. Given the way the CAR registry is structured, it is also possible for an illegal farm to register only the 'deforestation free' parts of its property in the CAR. Another option for 'white-washing' its cattle is to let it move to compliant properties that serve as middlemen before selling the beef to slaughterhouses (see figure 8 below).

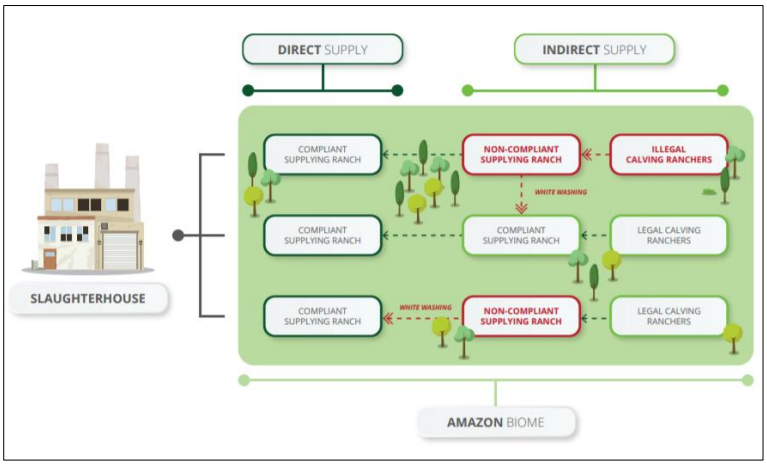

Figure 8: infographic illustrating the different ways of 'laundering' cattle.

[22] Leaves, 2018

[23] https://www.idhsustainabletrade.com/uploaded/2018/06/IDH_Business-case-study_Sao-Marcelo_Brazil_cattle-ranching-1.pdf

White washing (or 'cattle laundering') is seen as one of the biggest issues today. In 2017, Greenpeace pulled out of the agreement following white washing scandals and an overall credibility crisis of the sector to address the issue.[24]

Third, is the issue of market leakage. A significant market share of the sector belongs to slaughterhouses that are currently not regulated by the Federal Public Prosecutor. 'Leakage' arises when ranchers choose to sell cattle to those buyers that are not applying the same compliance protocols.[25] This leakage leads to serious commercial considerations for meatpackers that want to enforce "above business as usual practices" to suppliers—mainly related to competitiveness and loss of market share. Suppliers may have to bear a too high of a cost (or perceive too few incentives) to be compliant, which would drive them away from selling to these 'stricter' slaughterhouses. Alternatively, a meatpacker may find itself with too high of a share of its supply base cut off due to non-compliance, as a result of its zero-deforestation pledges (and depending on conditions such as cut of dates, compliance protocols, etc.) therefore posing a threat to its commercial viability.

Politically as well, a meatpacker announcing a zero-deforestation commitment beyond what is required by law, unilaterally and without discussion with key stakeholders on the ground, risks antagonizing governments and farmers. Similar situations have been experienced in the soy sector, and have triggered negative reactions from the respective governments, farm sectors, and other members of regional societies. The implications become more acute as most suppliers do not have a direct relationship with the meatpackers. Outreach to either include them, make them aware of the policies and non-compliance issues, and supporting them in solving these, is currently very limited.

At best—when a meatpacker adopts and manages to implement these commitments for all its supply chain—it might end up causing a split in the market, without effectively addressing the risk within the sector. When companies that are vulnerable to reputational risks pull out of a region, others that are less vulnerable to these risks and less committed to sustainability are ready to step in with less competition. The net effect could be a split market, where responsible companies migrate away from areas of active deforestation. The current impact of the G3 agreement against effective reduction of deforestation rate is good illustration of such phenomenon.

All in all, the business as usual scenario for meatpackers today is reflected by persistently high risks of deforestation. Inertia for establishing traceability, improved sector governance and Environmental and Social ("E&S") compliance at all segments of the chain, are some of the causes. Alternatively, if not carefully managed, isolated actions by players like Marfrig, could lead to an exacerbation of these negative impacts (e.g. social exclusion and continuously higher deforestation rates).

6. Landscape Protection Plan

Similar to its largest peers, Marfrig currently screens its direct suppliers to guarantee that (i) they are not involved in new deforestation activities (with a cut-off date in 2009); (ii) they are in compliance with environmental laws; (iii) they have adequate land ownership rights; (iv) are not exposed to forced labour practices; and (v) their land does not present other irregularities including overlap with conservation units or indigenous peoples' land. Marfrig carries out additional screening procedures related to the rights of Indigenous People, traditional communities, and land conflicts. As per its agreements with the MPF, a third-party assessment is carried out by Marfrig during yearly audits to independently evaluate the implementation of its cattle acquisition procedures.

Figure 9 illustrates the map of the company's direct suppliers (blue areas). From 2009 to 2019, Marfrig blocked a total of 3,504 ranchers that wanted to sell cattle to the company. Out of all the blocked suppliers, 833 were from the Amazon Biome in Mato Grosso. Of the 833, 90% were blocked due to deforestation related reasons, 4% due

[24] Leave, 2018

[25] It is worth noting that given the low profitability margins of cattle ranching and considering that part of the market are not requiring any legal status for buying cattle, the incentive to sell to non-TAC signatories (i.e. mostly slaughterhouses registered to districts) is stronger than going through so-called 'white washing' agreements: it is more profitable to sell the cattle for these less-restrictive slaughter-houses than to loose part of his profit to other compliant producers.

to demonstrated overlaps with indigenous areas, 2% due to overlaps with protected areas, and 4% due to other reasons.

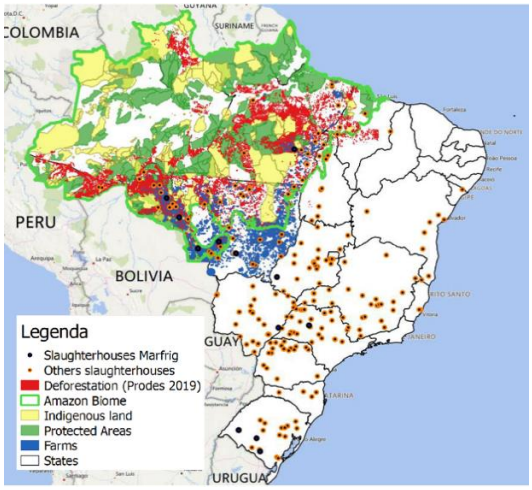

Figure 9. Deforestation as per Marfrig's monitoring system in Legal Amazon states, in 2019. Source: Marfrig

Over the last five years, and as per the annual independent audits carried on the company's cattle acquisition procedures, Marfrig demonstrated 100% compliance with the G3 and TAC commitments regarding direct suppliers. Nevertheless, Marfrig is aware of the issues stemming out of current business practices, and as they relate to the indirect suppliers that are currently not being reached. Against the attention that the sector is receiving, the company believes it must reaffirm the 2009-Commitment made and deepen it. By using advanced technologies to control deforestation and by being able to better identify gaps, the company has become more capable of fulfilling what has been previously agreed and to go further: providing the full traceability of its chain, including its indirect suppliers; and by promoting the social inclusion of farmers, as well as local and indigenous communities. The following sections highlight Marfrig's commitments, the interventions it has planned for to meet these commitments, as well as other critical pieces of its implementation framework such as the milestones, the budget, and the MRV strategy.

6.1. Marfrig's commitments

Following the issuance of its sustainable transition bond (June 2019), Marfrig launched its Verde+ Plan in July 2020 to illustrate the roadmap for achieving a sustainable and deforestation-free supply chain. The plan was developed in partnership with IDH – the Sustainable Trade Initiative. It covers a five-year detailed execution roadmap marked by deadlines and goals that support its 2030 vision. Through the plan, **Marfrig ultimately commits to achieving a deforestation free supply chain in the Amazon Biome by 2028 and in the Cerrado Biome by 2030**. Success in meeting this commitment requires progress in achieving the undermentioned building blocks:[26]

Risk calibrated approach: Marfrig is the second largest meatpacker in Brazil and its supply chain is large and complex.
Since the solutions for tracing and monitoring indirect suppliers need to be built, piloted, and be implemented all at scale, Marfrig will use a risk-calibrated approach to ensure that high risks areas are addressed with the appropriate level of stringency. The objective is to identify the critical areas (at municipality level) from an environmental and social risk perspective based on multiple datasets. These 'risk maps' for instance, will compare vegetation maps against the areas where the breeding and rearing suppliers are located, and enable the identification of areas that present the highest risks of deforestation. **Marfrig commits to develop the risk maps, as the basis of the follow up building blocks, by the end of 2020**.

[26] Marfrig's commitments with regards to addressing E&S risks within its supply chain, in line with its Verde+ plan, are also reflected in the company's action plan contractually agreed with &Green. The action plan is available on &Green's website.

Traceability: Traceability to farm of origin allows companies to engage with their suppliers, understand their needs and work together to promote desired change. It also allows companies to understand land-use change, identify related issues and mitigate them (whether it is linked to deforestation or to the socio-productive exclusion of the actors within the production chain). Using a voluntary questionnaire sent to its direct suppliers, the company is gathering information on the indirect suppliers that sell cattle or calves to its direct suppliers. To date, Marfrig has 1,711 indirect suppliers registered in its supplier database through RFI. However, filling the RFI is voluntary, and the information provided is self-declaratory.

To strengthen its traceability, and through the Verde+ Plan, Marfrig will pilot different mechanisms that demonstrate different degrees of control, across regions presenting different levels of risks. Examples of such mechanisms are the use of chips and ear tags in cattle, satellite monitoring, georeferencing of farms, blockchain systems. Some of these mechanisms are already being used by Marfrig—yet, they have not been tested on indirect suppliers and at scale. The objective of the pilots will be to use them more intensively and scale up the use of the ones that are proven successful. **Marfrig commits to have 100% of the cattle it purchases traced to its farm of origin by the end of 2025**.

Zero Deforestation conditions on the entire supply chain: Marfrig is currently able to eliminate deforestation related risks up to the level of its direct suppliers.

Following its risk-calibrated approach, Marfrig will develop cattle purchasing policies and conditions that are tailored to the risk level of the municipalities its suppliers are located in. Once traceability mechanisms are established, Marfrig commits to automatically apply legal compliance protocols to all indirect suppliers in the same year (by 2025). Eliminating legally permitted deforestation is not as straightforward. Here, the objective is to deploy sensible 'beyond legal compliance' based protocols and assistance programs enabling Marfrig to address legal deforestation as well (e.g. differentiated cut off dates, E&S requirements, etc.). Priority is given to Amazon Biome suppliers. Regarding the Cerrado, Marfrig has created a structure to extend satellite geo-monitoring to this Biome, as well as to implement the instruments required for control along the chain. **As a result, Marfrig plans to eliminate all illegal deforestation by 2025, and eliminate all legal deforestation among indirect suppliers in the Amazon Biome by 2028, and in the Cerrado Biome by 2030.**

Inclusion of farmers to create incentive for compliance: Excluding farmers involved in deforestation from its supplier base would only put an end to the problem for the company's supply chain; as those farmers will continue to deforest. For a more systemic and effective change, it is necessary to go beyond exclusion and move towards the inclusion of these farmers. After the establishment of it 2009 cattle acquisition procedure, in 2010, Marfrig developed its Marfrig Club Program to foster the relationship between cattle producers and the company. The club is used as platform to support knowledge sharing and promote incentives-based schemes for improving environmental and social practices. Marfrig has a target of 100% of direct suppliers registered in Marfrig Club by the end of 2020 (83% currently).

As the company's zero deforestation procedures will expand to indirect suppliers, so will its inclusion-based approach. Marfrig will establish a network of programs that target small and medium producers to provide Technical Assistance and finance mechanisms for the implementation of the farm level changes; these relate to animal nutrition, herd management, sustainable pasture management, land registration, environmental compliance (CAR registration and PRA implementation), and others. The inclusion of these farmers makes it possible to achieve social, economic and environmental gains in these areas, insofar as it maintains and regenerates biodiversity. They also allow Marfrig to improve supplier's ability to comply to its policies.

Transparency towards the wider public on progress: Marfrig's initiative takes into consideration the weaknesses that are inherent to the sector (i.e. lack of traceability, informality, lack of incentives for E&S compliance, etc.), in a transparent manner and seeks to establish an open dialogue with society. This dialogue will be essential to monitor the implementation of Marfrig's commitment, and ideally make it more effective, through sector wide advocacy. The wider public will be able to monitor Marfrig's progress by accessing the company's information on open platforms, to allow for accountability of Marfrig and sector ownership of the plan's execution.

Marfrig commits to publicly report on its progress regarding the implementation of the Verde+ Plan, through key performance indicators (see section 9), via the &Green website. Additionally, Marfrig's ability to meet &Green

Action Plan will also be audited by a third-party auditor. Summaries of the audit results will be made public on &Green's website.

6.2. Interventions at each segment of the supply chain and on the sector

The plan's interventions are structured according to the levels of engagement, considering actions for direct suppliers, indirect suppliers and issues that affect a joint positioning of the actors directly involved with the sector.

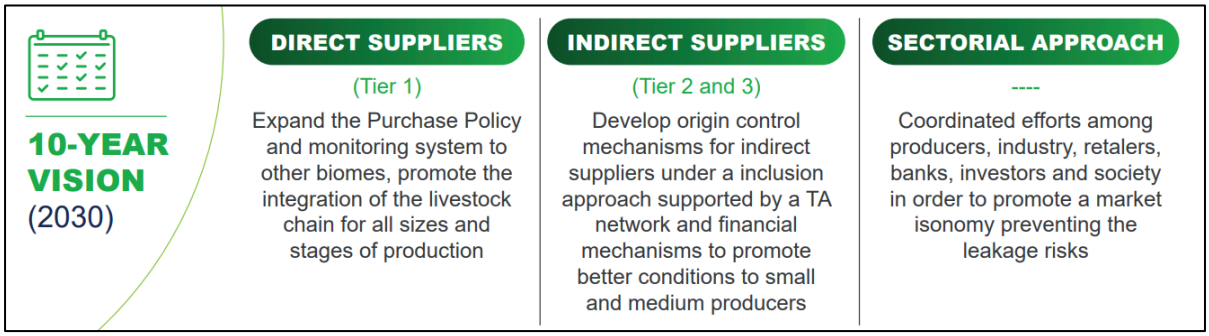

Figure 10: Marfrig Verde+ interventions. Source: Marfrig

6.2.1. Direct Suppliers (Tier 1)

Marfrig procured its cattle from approximately 5,525 direct Amazon Biome suppliers in 2019 (including the state of Mato Grosso, Para, and Rondônia). For these direct suppliers, the company's vision is to establish new forms of relationships that support a more organized chain, through the development of a commercial integration model. Over the course of the last three years, Marfrig has been aiming to increasingly integrate the chain and get closer to its suppliers: the number of existing suppliers who have repeated negotiations and transactions with the company has been increasing each year.

Existing suppliers (old)					
	Year	Farms	% Farms	Slaughter	% Slaughter
MT / PA / RO	2017	1.945	52%	818.747	71%
	2018	2.881	55%	1.072.528	73%
	2019	3.786	69%	1.160.511	80%

Figure 11. Number of existing suppliers in Amazon Biome states from 2017 to 2019. Source: Marfrig

In 2019, sixty-nine percent of Marfrig's suppliers in the Mato Grosso, Rondônia and Pará states, were existing suppliers (that traded with them in the previous years). These producers supplied approximately eighty percent of the animals slaughtered in 2019 in the three states.

In the short term, Marfrig is expanding its monitoring system and is adapting it the cattle purchase policy, for monitoring direct suppliers in the Cerrado. These actions are accompanied by the improvement of the producers' ability to invest in their properties through technical assistance programs, financial instruments, and recognition through the Marfrig Club.

6.2.2. Indirect Suppliers (Tiers 2 and 3)

Based on its RFI tool, Marfrig estimates that it currently has potentially 25,000 indirect suppliers in the Amazon Biome only. Marfrig currently has no direct relationship with these suppliers nor programs that are targeting these segments of the supply chain.
Marfrig's vision is to track the origin of cattle at farm level and throughout the various production levels (from breeding to the slaughterhouse), in the Amazon and the Cerrado (i.e. 'Origin control'). Beyond its existing RFI tool, Marfrig aims to apply additional traceability solutions in high risk areas (identified by the Risk Maps). Tailored

solutions will be applied according to the risk level of each region and to the commercial conditions set forward to suppliers. The pilots are expected to be carried out until 2025, after which Marfrig commits to scale up successful pilots and solutions across Marfrig's supply chain in Amazon Biome.

At the same time, Marfrig will refine its E&S cattle acquisition policies for its indirect suppliers (criteria and protocol), addressing legal and illegal deforestation in the Amazon Biome and then in the Cerrado. Using its risk maps, the risk-based approach for application of differentiated criteria (based on risk and level of control) will be established, as well as a roll-out plan of control measures.

Finally, achieving the 'Origin Control' will be also be used as to mean for bringing technical assistance and financial instruments to small and medium indirect suppliers; the later will benefit from a technical assistance network (built from the pilot with IDH in the Juruena Valley), which should help them improve on their profitability and get easier access to finance.

6.2.3. Sectoral Approach

Given the breath of Marfrig's supply chain, its action will only be effective in achieving complete transformation at all production tiers, if other market actors move in the same direction and promote a level playing field. To this end, the plan includes sector engagement related actions and targets to mitigate the various risks and take advantage of market opportunities.

For instance, Marfrig is engaging with key private-sector and public institutions to 'homogenize' the TAC signatories' monitoring protocols and integrate additional public information (e.g. animal transit data with environmental data) that can reduce leakage and improve the identification of cattle laundering activities.

Other efforts include supporting the development of positive incentives and pathways to support producers' ability to invest in best practices (e.g. the development of a pre-competitive technical assistance model and certification schemes for the recognition and remuneration of carbon neutral production models).

Lastly, the plan includes the development of institutionally recognized protocols that can allow publicly blacklisted suppliers, to legitimize their progress towards legal compliance, therefore enabling them to legally re-enter the market.

6.3. Stakeholder engagement

Attempting to eliminate deforestation completely from a value chain requires significant innovation in the processes applied to suppliers and in the partnerships to be created for addressing the issues. For Marfrig, industry initiatives and alignment between public and private institutions present vital opportunities, as they can help the company develop creative solutions which would otherwise not be feasible within the scope of their own operations. The Verde+ plan calls for networking, partnerships with the private sector, civil society organizations, the academia, and joint actions with the Federal public prosecutor. Below are some of the key relevant stakeholders for Marfrig to implement its LPP and reach its ambitions.

Partnerships	Objectives and scope
With IDH, The sustainable trade initiative (Brazil)	
IDH and Marfrig has signed an MoU in September 2019.	Focused on the Transition Bond commitments, the partnership aimed at supporting the design of the Verde+ plan and its subsequent elements for achieving a deforestation free supply chain.
The Sustainable Production of Calves Program in Juruena Valley	Aimed at promoting traceability and better cattle ranching practices at the upstream level, the partnership with IDH and Carrefour Foundation provides direct technical assistance training and pilots ear-tagging traceability tools.
Ministerio Publico Federal (MPF)	
MoU on "Projeto Boi na Linha", including Imaflora	Aimed at addressing the misalignment between the different monitoring systems of TAC/G3 signatories, the objective is to design an 'Homogenized Protocol' for Cattle Purchase which should be applied by all.

MoU on "Plataforma de monitoramento da regeneração Ambiental de áreas desmatadas", including IMAC (Instituto Mato-Grossense da Carne)	Aimed at addressing the issue of permanently excluding non-compliance suppliers, the partnership will lead to the development of protocols and standards for the re-insertion of blocked suppliers (direct in the short-term and indirect in the medium-term - monitoring solutions to farmers).
Agroicone	
Project partnership "Originação Sustentável da Carne Bovina"	Partnership aimed at improving Marfrig's understanding of indirect suppliers environmental and social risks at a municipality level in the Amazon Biome. The outcome will be the deforestation risk maps for cattle acquisition including direct and indirect suppliers in different Brazilian biomes.
The PCI institute	
Marfrig is one of the 8 founding organizations of the PCI Institute.	As a public-private association recognized as the official implementer of the Mato Grosso State PCI Strategy, the institutes aims at delivering is the official private partners recognized by the State Government and the World Bank, for the implementation of the PCI State Strategy up to 2030.
The Juruena Valley Regional PCI Compact	
Marfrig has signed the regional PCI compact in Juruena Valley, to support the landscape governance model developed for the region	The Juruena Valley is responsible for the production of 1/3 of the calves in Mato Grosso State, so it is a region characterized by small and medium sized cattle ranchers, where Marfrig will pilot part of the solutions for indirect suppliers. The PCI Regional Compact is the landscape governance model that has established medium-term targets under the Production, Conservation and Inclusion axes.
Amigos da Terra (Friends of the Earth Brazil)	
Project partnership "Desenvolvimento e ferramentas para o monitoramento socio-ambiental da cadeia produtiva da carne"	Partnership for the improvement of traceability of indirect suppliers. The outcome of the project should result in estimating the number of direct suppliers in non-compliance based on indirect supplier performance and identify the possible bottlenecks for the implementation of a monitoring system for indirect suppliers.
Safetrace with P4F and TNC	
Project partnership "Programa Pecuária Responsável"	Partnership for the improvement of traceability of indirect suppliers via the use of block chain solutions, the projects aims at developing and piloting block-chain application to report on zootechnical and environmental information. Marfrig would contribute with the geo-monitoring system indicating the environmental situation and regularization needs.
WWF Brazil	
Project partnership under WWF's existing "Collaboration for Forests and Agriculture" CFA framework	Partnership for the improvement of traceability of indirect suppliers. The work will support the assessment and improvement of Marfrig's supply chain monitoring approach based on the assessment of documentation and processes through WWF's existing framework.
Other partners and initiatives	
With H20, Geoflorestas, Embrapa, TNC, RA, etc.	Marfrig also (positively) impacts the cattle farming community and beef value chain by the way in which it conducts the business, by means of support and engagement to (i) environmental projects and/or actors, such as Amazon Biome Pact, Rainforest Alliance certification, CDP Forest and The Nature Conservancy-TNC; (ii) suppliers, mostly be means of MARFRIG CLUB and Cattle Purchase Policy; (iii) the improvement of the global protein chain, through the Global

	Roundtable for Sustainable Beef (GRSB), Brazilian Roundtable for Sustainable Beef (GTPS), Tropical Forest Alliance (TFA), National Pact to Eradicate Slave Labor Institute (InPACTO) and Research for Reduction of Carbon Footprint (with Embrapa).

7. Milestones

Many of the actions will be simultaneous and interconnected, and involve networking, partnerships with civil society organizations and academia, as well as jointly working with the MPF. The infographic below (figure 12) depicts the various milestones that have been set to gradually expand its environmental and social policies, to all indirect suppliers in the Amazon Biome, and direct and indirect suppliers in Cerrado Biome.

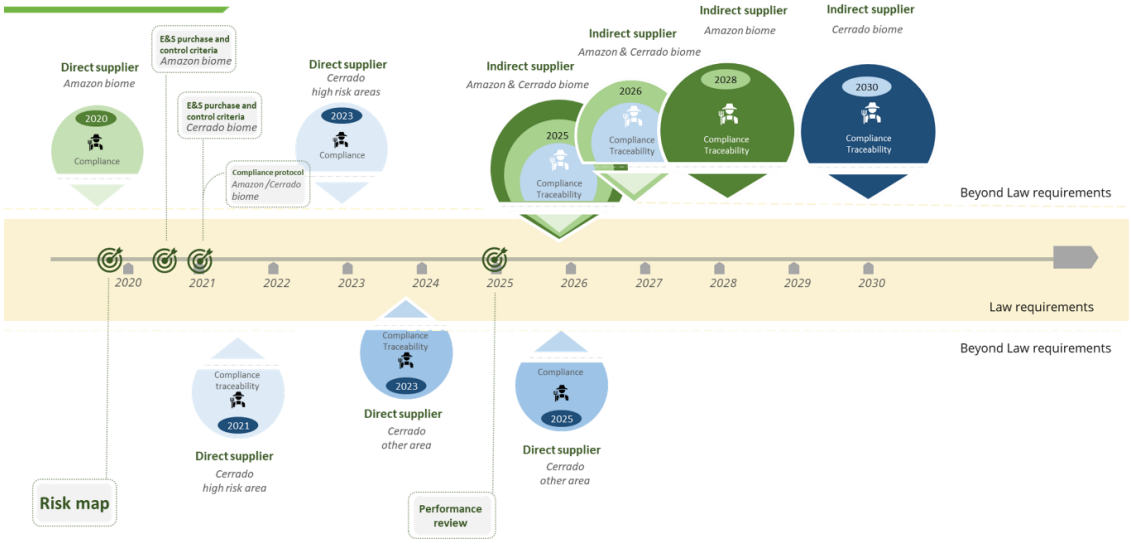

Figure 12: Action Plan Timeline of Marfrig to implement the LPP and its zero-deforestation commitment

Traceability of the entire supply chain is the first key milestone for the company, which aims to achieve it by 2025 over all biomes and segments. Thereafter, legal compliance and beyond legal compliance protocols will be implemented segment by segment (tier two suppliers first and then tier 3), and biome by biome.

8. Monitoring and Reporting

Marfrig aims to demonstrate progress towards its commitments through accurate, thorough, and timely reporting so that their investors, business partners, governments, civil society, and consumers can make decisions based on credible information.

Marfrig's monitoring and reporting framework with respect to &Green's Action Plan will be built with the objective to first report on activity-based progress against the defined Action Plan activities. Progress achieved against the agreed upon milestones will be monitored and self-reported on a 6-monthly basis during the first two years of the transaction, and annually for the remaining tenor of the &Green loan, until 2030. Third party audits will confirm the self-reported information every two years. Annual self-reported and third-party audits on activity-based progress will be disclosed on &Green's website.

Ultimately progress on these activities will allow Marfrig to also report on the outcomes and results of the action plan; namely, on its ability to (a) map suppliers, (b) achieve supply chain legal compliance and (c) achieve supply chain compliance beyond legal requirements and against its no deforestation and other E&S criteria. Marfrig and &Green will define together what key performance indicators on results will be publicly presented annually, on &Green's website, in addition to the activity-based reporting and audits mentioned above.

Annex 1. The summary of the transaction's Environmental Returns & Social Inclusion, monitoring methodology and schedule.

Environmental returns and Social Inclusion

&Green assesses the Marfrig transaction with respect to its potential Environmental and Social inclusion impact generated within the landscape boundaries defined in the landscape protection plan ("LPP"). Environmental and social impact, expressed as 'Environmental Return and Social Inclusion', can fall under four categories:

1) Forest Conserved: existing natural forest that is protected. Following the &Green KPI framework – Forest Conserved is measured through public database of the Rural Environmental Registry System (Sicar), which includes spatial information related to the polygon of each property, among them the information called "área de reserve legal" and also other information called "remanescente de vegetação nativa".
2) Land sustainably intensified: unproductive and/or degraded pastureland that has been regenerated via improvements of soil quality (pasture reform), leading to an increase in yield per hectare, with the intention to increase the yield per hectare and thereby reduce pressure to clear new forest areas.
3) Forest Restored: degraded forest areas or agricultural areas where forest is restored, according to the legal requirements established by the Forest Code and State laws.
4) Smallholders benefiting: cattle ranching small-scale producers that are receiving services to improve their livelihoods. A smallholder is defined as per the Brazilian legal definition (less than 4 units of lands ~100ha/unit) and as a family run farming business.

Geographical boundaries for calculating the ERs and Social Inclusion:

Contributions to the Environmental Returns and Social Inclusion can be realised from the areas of influence of the company towards land use change and towards the people. It is based on degree of control and level of assurance. As explained in the section 4 of the LPP, Marfrig's influence on land use (and forest protection) is reflected by the actions and degree of control that Marfrig will have on its suppliers.

Quantification of ERs and Social Inclusion is undertaken in the context of jurisdictional eligibility (i.e. jurisdictions must be approved as eligible jurisdiction for investments, based on a set of criteria related to existence of forest and commitments to reducing deforestation). At the time of transaction, and in line with the jurisdictional approval process of &Green, Mato Grosso is the only state that has received JECA approval by the &Green fund. Marfrig's commitments on contractually agreed minimum ERs to be generated for the transaction will be specifically associated to the company's influence within the Mato Grosso state.

However, provided that the Marfrig's Verde+ plan - as presented in the LPP - covers both the Cerrado and Amazon biomes of Mato Grosso, Marfrig expects to generate additional impacts within the Cerrado biome within Mato Grosso. These additional impacts will not constitute contractual commitments but Marfrig will report on and account for them as part of Marfrig's overall impact.

Transaction's ERs:

The transaction's Environmental Returns are the sum of (a) results of Marfrig's actions with its direct suppliers, and (b) the potential results of the programs Marfrig is supporting to reach indirect suppliers – within the Mato Grosso state (Amazon and Cerrado Biomes).

The quantifiable ERs, both from direct suppliers and from partnership interventions are summarised below:

ER 1: Conserved forest	ER 2: Land sustainably intensified	ER 3: Forest restoration	SI: Smallholder farmers benefiting
>1,254,500 ha	7,000 ha	6,000 ha	157 smallholders

The contractually agreed ERs are generated by four key interventions: (1) the monitoring and control over direct suppliers, (2) the monitoring and control measures over indirect suppliers, (3) The IDH smallholder outreach programme (the sustainable production calve Program) to increase forest code compliance and sustainable farming practices, and (4) the re-insertion of blocked suppliers (direct in the short-term and indirect in the medium-term - monitoring solutions to farmers), in partnership with IMAC (or equivalent).

Details of each ER and Social Inclusion Targets and of these supporting activities are further described below:

Commitment to hectares of forest conserved (Environmental Return 1)

Marfrig commits to generate a minimum of 1,254,500 hectares of forest conserved through three interventions:

1) Marfrig maintains an approved supplier list of ranchers who maintain, on their properties, an aggregate amount of 1.2 million hectares of Forests. Out of the 1.2 million hectares, at least 600,000 hectares will be above the Brazilian forest code legal requirements (i.e. over and above the APP and legal reserve). Marfrig will only purchase cattle from an Approved Supplier; that is from a rancher listed in the company's geo-monitoring system and located in the Mato Grosso state (Amazon and Cerrado Biomes) and that is compliant with all of Marfrig's E&S purchasing policies.

2) Extend zero-deforestation purchasing policies to indirect suppliers, to guarantee additional forest protection through 2nd and 3rd tier suppliers.
   New monitoring system and purchasing policies for indirect suppliers will be developed based on the results of the Indirect Suppliers Risk Map, developed by Marfrig with Agroícone. The results of the risks maps will help define key risks and severity of risks by area, based on overlay of Marfrig's direct suppliers' location—in turn clarifying what are the best criteria and protocols to be applied. Once the systems and policies developed, Marfrig will be able to apply them to its indirect suppliers (by 2026 for tier 2 and by 2028 for tier 3). At the time of the transaction, estimating the hectares to be protected by indirect suppliers is not possible, due to lack of visibility on the numbers and location of indirect suppliers. In December 2023, and after the indirect supplier risks maps are developed, and the traceability pilots have started, Marfrig and &Green will agree on a reasonable estimation of hectares of forest conserved by indirect suppliers, and on a reasonable timeline. The estimated hectares to be conserved by indirect suppliers will be added, as additional impact, to the existing ER 1 of 1,254,500 ha that have been agreed. These will be reported every year thereafter.

3) Support the Sustainable Production Calves Program, which is set to generate 54,500 ha of forest conserved by the calve breeding farmers of the program.
   Marfrig is partnering with IDH in the Sustainable Production of Calves Program. Over the next three years, the program will support a total of 157 smallholders in Juruena Valley to ensure compliance with the Brazilian Forest Code, leading to guaranteed forest conservation over the course of the loan tenor. Key program activities will include providing training on on correctly registering the CARs and educating them on the benefits of no-deforestation and biodiversity conservation.

ER 1 Target - summary table

ER 1: Forest Conserved			
Intervention	Direct suppliers via P&Cs	Indirect suppliers via P&C	Indirect supplier via Sustainable Calves Program
Target: Min 1,254,500 ha of forest conserved	1,200,000 ha (out of which 600,000 ha is in excess of Legal Reserve)	Ha to be confirmed in December 2023 (as additional impact)	54,500 ha
Activities:	Marfrig will only purchase cattle from an Approved Supplier. The above results in the intent to apply zero deforestation requirements to all direct suppliers that wish to sell to Marfrig.	*Please refer to Action Plan Action 1.1: Prepare a risk map for calf breeding areas in Amazon Biome. Action 1.2.1: Define purchase and control criteria. Action 1.2.4: Achieve and maintain compliance of 1st, 2nd and 3rd tier suppliers in the Amazon and Cerrado	Marfrig will be a partner and sponsor of the IDH program, which aims to train farmers on land tenure and environmental regularization.

		biomes against the updated/new cattle purchasing criteria (see 1.2.1) and compliance protocol.	
ER 1 KPIs to be reported on:	• Number of Approved Suppliers • Total area of Approved Suppliers' farms • Area of Legal Reserve on Approved Suppliers' farms • Area in excess of forest standing over and above APP and LR on the Approved Suppliers' farms.		
Baselines (2019 figures):	• Number of Approved Suppliers = ~2,500 • Total area of Approved Suppliers' farms = ~3,700,000 • Area of Legal Reserve on Approved Suppliers' farms = ~1,200,000 ("reserva legal") • Area in excess of forest standing over and above APP and LR on the Approved Suppliers' farms = ~600,000 ("remanescente vegetação nativa")		

Commitment to hectares of sustainably intensified land (Environmental Return 2)

Marfrig commits to generate 7,000 ha of sustainably intensified land, through its support of the Sustainable Production Calves Programs.

Marfrig is partnering with IDH in the Sustainable Production of Calves Program. Over the next three years, the program will support a total of 157 smallholders in Juruena Valley in adopting best management practices to intensify calf production and free up land for sustainable farming. Key training activities cover:

- techniques of intensification of the pasture and better use of the available fodder,
- use of recognized genetics for field production,
- sanitary aspects related to the evolution of production indexes,
- Use of tools for the proper economic management of the property,
- Rational use of capital for investment on the farm.

ER 2 Target - summary table

ER 2: Land sustainably intensified	
Interventions	Through the Sustainable Production Calves Program
Target: 7,000 ha	7,000 ha
Activities	Providing training on increasing efficiency, production and reducing carbon emissions.
ER 2 KPIs to be reported on:	• Number of farmers reached • Area of pastureland intensified*, in hectares • Average yields per hectare (considering all farmers reached) *intensification is achieved when the average yield from reached farmers is 2 UA/ha.
Baseline (2019 figures):	• Number of farmers reached = 55 • Area of pastureland intensified, in hectares = 0 • Average yields per hectare (considering all farmers reached) = 1

Commitment to restore hectares of forest (Environmental Return 3)

Marfrig commits to generate 6,000 hectares of forest restored, through two interventions:

1) Support the Sustainable Production Calves Program, which is set to generate 1,500 hectares of forest restored by the calf breeding farmers of the program.
   Marfrig is partnering with IDH in the Sustainable Production of Calves Program. Over the next three years, the program will support a total of 157 smallholders in Juruena Valley to ensure compliance with the Brazilian Forest Code, regarding the adhesion to the CAR and the respective contingency recovery plans (PRA). Key program activities will include providing training on on correctly registering their PRA to the environmental authorities and implementing them (mainly through setting correct boundaries and protections for set aside areas).
2) Its partnership with the MPF and IMAC – 4,500 ha of forest restored (estimated) by blacklisted direct suppliers that are being re-inserted into accepted suppliers list.

Marfrig is partnering with the Federal Public Prosecutor and the IMAC Institute (Instituto Mato-Grossense da Carne), under the umbrella of its MoU "Monitoring Platform for Regenerating degraded areas" ("Plataforma de monitoramento da regeneração Ambiental de áreas desmatadas"). Aimed at addressing the issue of permanently excluding non-compliance suppliers, the partnership will lead to the development of protocols and standards for the re-insertion of blocked suppliers (direct in the short-term and indirect in the medium-term). IMAC, taking the role of certification body, will provide assurance that blacklisted suppliers that have received a PRA for compensation by the environmental authority are in the process of restoring forest and legal compliance. Ultimately, through IMAC's guarantees and Marfrig's adjusted protocols (vetted by the federal prosecutor), Marfrig estimates that it will be able to incentivise the restoration of 4,500 hectares of forest by its suppliers (direct and/or indirect).

The 4,500-hectare target is based on an estimation of achieving an average restored area of 30 ha/farmer.

ER 3 Target - summary table

ER 3: Forest restored		
Interventions	Sustainable Production Calves Program	Re-integration program
Target: 6,000 Ha	1,500 Ha	4,500 Ha
Activities	• Support compliance with the environmental legislation regarding the adhesion to the CAR and the respective contingency recovery plans (PRA). • TA at farm-level for environmental diagnosis and restoration activities implementation	• Support compliance with the environmental legislation regarding the adhesion to the CAR and the respective contingency recovery plans (PRA).
ER 3 KPIs to be reported on:	• Number of farmers reached by the Sustainable Production Calves Program, • Area set aside for forest restoration (in hectares), • Number of suppliers re-inserted in Marfrig supply chain as a result of the IMAC certification and, • Area set aside for forest restoration as per IMAC certification (in hectares).	
Baseline (2019 figures):	• Number of farmers reached by the Sustainable Production Calves Program, • Area set aside for forest restoration (in hectares), • Number of suppliers re-inserted in Marfrig supply chain as a result of the IMAC certification and, • Area set aside for forest restoration as per IMAC certification (in hectares).	

Commitment to smallholder inclusion

Marfrig commits to support the inclusion of 157 producers through its support of the Sustainable Production Calves Programs. Marfrig is partnering with IDH in the Sustainable Production of Calves Program. Over the next three years, the program will support a total of 157 smallholders in Juruena Valley. Additional activities, beyond the ones mentioned above, and which seek to promote improvements in farmers' livelihoods, include:

a) Support in obtaining credit and directing the rational use of the activity,
b) Increasing incomes through intensification of calf production.

SI Target – summary table

SI: Smallholder benefiting	
Intervention	Sustainable Production Calves Program
Target: 157 smallholders	157 smallholders
Activities	Various activities supporting increased incomes from cattle ranching production, diversification of income streams, land and environmental regularisation, access to credits and to investors.
Smallholder inclusion KPIs to be reported on:	Number of smallholders benefiting
Baseline (2019 figures):	Number of smallholders benefiting = 55

Delivery schedule of minimum targets:

Environmental Returns	Baseline (YE 2019)	Target	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
ER 1: Forest conserved													
ER 1.1 from direct suppliers	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000
Of which 600,000 is in excess of LR	600,000	600,000	600,000	600,000	600,000	600,000	600,000	600,000	600,000	600,000	600,000	600,000	600,000
ER 1.2 from indirect suppliers (additional impact)	0	0	0	0	0	*Estimated in Dec 2023*							
ER 1.3 from the IDH Sustainable Production of Calves Program	5,511	54,500	8,500	37,000	54,500	54,500	54,500	54,500	54,500	54,500	54,500	54,500	54,500
ER 2: Land sustainably intensified													
ER 2.1 from the IDH Sustainable Production of Calves Program	0	7,000	1,000	3,500	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000
ER 3: Forest restored													
ER 3.1 3 from the IDH Sustainable Production of Calves Program	0	1,500	0	800	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
ER 3.2 from the partnership with IMAC (or equivalent)	0	4,500	0	0	0	0	0	0	500	1,000	2,500	3,500	4,500
SI: Smallholder farmers benefiting													
SI 1.1 from the IDH Sustainable Production of Calves Program	55	157	85	157	157	157	157	157	157	157	157	157	157

Monitoring Framework:

Marfrig will be providing an ER report to &Green every six months for the first two years and then annually thereafter. An audited report will be provided every two years.

The reporting format is to be agreed upon by &Green and Marfrig, as an annex of the contract between the parties. A different reporting format can be agreed for the six-monthly reports to be provided in the first two years (e.g. activity-based reporting).

Environmental Returns	Monitoring Methodology
ER 1: Forest conserved	
ER 1.1: from direct suppliers Of which hectares conserved are in excess of LR	Marfrig will report annually on KPIs. The information as well as compliance with Purchase & Control (P&C) procedure will be validated by an external auditor. The auditor will be DNV or equivalent (as per existing agreement with public prosecutor).
ER 1.2 from indirect suppliers (as additional impact) *Target to be defined in Dec. 2023*	Reporting from 2024 and annually on KPIs. The information as well as compliance with P&C's procedure will be validated by an external auditor. The auditor will be DNV or equivalent (as per existing agreement with public prosecutor).
ER 1.3 from the IDH Sustainable Production of Calves Program	Marfrig will report on KPIs through IDH annual program reports. After the end of the program (2023), reporting on ER compliance will be done by Marfrig (to be defined).
ER 2: Land sustainably intensified	
ER 2.1 from the IDH Sustainable Production of Calves Program	Marfrig will be providing IDH annual program reports, which will report on KPIs. After the end of the program (2023), reporting on ER compliance will be done by Marfrig (to be defined).
ER 3: Forest restored	
ER 3.1 3 from the IDH Sustainable Production of Calves Program	Marfrig will report on KPIs through IDH annual program reports. After the end of the program (2023), reporting on ER compliance will be done by Marfrig (to be defined).
ER 3.2 from the partnership with IMAC	Marfrig will report on KPIs.
SI: Smallholder farmers benefiting	
SI 1.1 from the IDH Sustainable Production of Calves Program	Marfrig will report on KPIs through IDH annual program reports. After the end of the program (2023), reporting on ER compliance will be done by Marfrig (to be defined).

Budgeted investments for the delivery of ERs:

Environmental Returns	Estimated budget (in USD)
ER 1: Conserved forest	USD 2,000,000
ER 2: Land sustainably intensified	USD 2,520,000[27]
ER 3: Forest restoration	USD 8,400,000[28]
SI: Smallholder farmers benefiting	The investments for SI are covered by the ER2 and ER3 investments
Total	USD 12,920,000

[27] Reference used from the Sustainable Production of Calves Program in Juruena Valley (360 USD/ha)

[28] Reference used from the Sustainable Production of Calves Program in Juruena Valley (1,400 USD/ha)