



Brasil Innovation Lab
for Climate Finance

RESPONSIBLE COMMODITIES FACILITY

INSTRUMENT ANALYSIS
SEPTEMBER 2018

Responsible Commodities Facility (RCF)

LAB INSTRUMENT ANALYSIS

September 2018

DESCRIPTION & GOAL —

A facility to promote the sustainable production and trading of responsible commodities, particularly soy, in the Brazilian Cerrado biome, through incentives to plant in deforested and degraded lands.

SECTOR —

Land use/ Forestry/ Agriculture/ Financial services

PRIVATE FINANCE TARGET —

Institutional and impact investors

GEOGRAPHY

For pilot phase: Cerrado region (Goiás, Mato Grosso, Mato Grosso do Sul)

The Lab identifies, develops, and launches sustainable finance instruments that can drive billions to a low-carbon economy. It is comprised of three programs: the Global Innovation Lab for Climate Finance, the Brasil Innovation Lab for Climate Finance, and the India Innovation Lab for Green Finance.

AUTHORS AND ACKNOWLEDGEMENTS

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ABOUT THE BRASIL LAB

Brazil aims to reduce greenhouse gas emissions by 43% by 2030, mostly through changes in its land use and energy sectors. Like in many emerging economies however, funding to meet these targets remains a challenge. In October 2016, a group of public and private investors – the Brasil Innovation Lab for Climate Finance – was established to tackle this challenge. The Brasil Lab identifies, develops, and supports implementation of transformative climate finance instruments that can drive funds for Brazil's national climate priorities. The Brasil Lab is one of the initiatives that was initially launched under the auspices of the Brazil-U.S. Climate Change Working Group, led by the Brazilian Ministry of Foreign Affairs and the U.S. Department of State. [Climate Policy Initiative](#) serves as Secretariat and analytical provider. The funders of the Lab are included below.



1. CONTEXT

Agricultural expansion into the Brazilian Cerrado, particularly for soy production, has led to increased deforestation in the region. An estimated 40 million hectares of degraded and already cleared lands in the region could ease the pressure on natural vegetation for agricultural expansion, but current funding mechanisms to redirect production are not sufficient.

Growing global demand for soy is driving continuous agricultural expansion in Brazil. This expansion of land under cultivation is a major driver of deforestation in the country, which accounts for 51% of Brazil's total greenhouse gas (GHG) emissions.¹ According to Brazil's nationally determined contribution (NDC), the country intends to reduce GHG emissions by 43% by 2030, with approximately 89% of this reduction expected to come from reduced deforestation.² As a part of this goal, Brazil intends to reforest 12 million hectares of forests, restore 15 million hectares of degraded pastureland, and introduce land-use best practices in 5 million hectares by 2030.³

Although deforestation in the Amazon rainforest has slowed, in part through efforts like the Amazon Soy Moratorium, the Brazilian Cerrado region has experienced increased pressure from agricultural expansion. Between 2013 and 2015, almost 2 million hectares of native vegetation were converted to agriculture, outpacing the deforestation rate of the Amazon. Initiatives including the Cerrado Manifesto⁴ call for an end to this practice, and for immediate action by companies purchasing soy and meat originated in the region, as well as by investors active in these sectors.⁵

One option to ease this pressure in the region is to use already degraded pasture and cleared land for agriculture, including to produce soy. An estimated 40 million hectares of such lands in the Cerrado could be used for this purpose,⁶ yet, existing funding mechanisms are not enough to redirect soy production into these areas. Furthermore, trade and procurement challenges still need to be solved in order to create efficiencies and enable this new market segment to reach the scale required to meet international demand for sustainably-sourced soy and halt current environmental impacts.

The Responsible Commodities Facility (RCF) aims to limit further expansion of agricultural land and deforestation in the Brazilian Cerrado by providing a range of incentives to produce agricultural commodities in already cleared and degraded lands. The facility will initially focus on soy, providing crop financing and land restoration loans to producers at better-than-market terms. Soy will be sold in an exchange that will link producers with international buyers interested in sustainable sourcing.

Over 10 years, the RCF will generate a cumulative US\$ 3 billion of loans to 600 farms. These will originate over US\$ 20 billion worth of soy and corn produced without incurring deforestation, avoiding emissions of over 55 million tonnes of carbon emissions.

1 Calculated for 2016. The share increases to 53% over 2006-2016 (SEEG, 2017).

2 EDF, 2016.

3 Federative Republic of Brazil, 2015.

4 WWF, 2017.

5 To date, the manifesto has been signed by 74 of the world's largest food companies (FAIRR 2018).

6 Carneiro Filho A. and Costa, K. (2016).

CONCEPT

2. INSTRUMENT MECHANICS

The Responsible Commodities Facility provides financial and non-financial incentives to produce soy in existing cleared and degraded lands in order to discourage further expansion of agricultural land in the Brazilian Cerrado.

2.1 OVERVIEW & OBJECTIVES

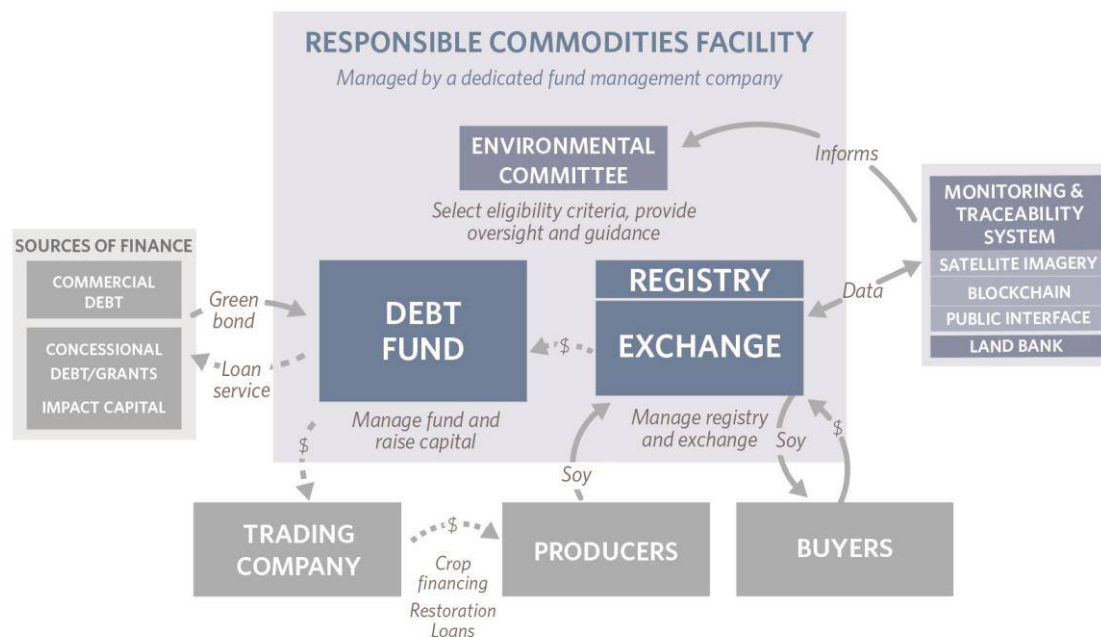
The Responsible Commodities Facility (RCF) will work in the following manner (also illustrated in Figure 1):

- **The RCF will be managed by a dedicated fund management company**, responsible for i) managing the Facility and its investment, ii) coordinating activities with the Environmental Committee and other stakeholders, iii) conducting the screening and monitoring of farmers. In the first half of 2018, the proponent (BVRio Environmental Exchange) incorporated a new fund management vehicle, Sustainable Investment Management (SIM), to fill this role.
- **Financing for the RCF debt fund will be raised by issuing investment grade-rated green bonds**, financed primarily by commercial debt from institutional investors, as well as subordinated debt and grants. The first bond is expected by early 2019 and will finance the crop financing credit lines.
- **Through a partnering trading company, the RCF will provide local soy producers with tailored financing solutions.**
 - Initially, it will provide a revolving one-year credit line for soy and corn cultivation at better-than-market terms in the form of crop financing. Only farmers that meet the RCF's eligibility criteria will be able to apply.⁷
 - Subsequently, the RCF plans to offer up to six-year loans to support farmers restoring degraded lands.
 - To promote behavioral change, the RCF could offer additional incentives in the following years, like loans for compliance with the Brazilian Forest Code and financing for on-farm infrastructures (i.e. silos and storing facilities).
- **The soy produced will be sold in a dedicated exchange**, linking producers with international buyers interested in sustainable sourcing. The exchange will include storing facilities that will aggregate the production of several farmers, creating appropriate volumes for international trade.
 - Producers that apply for funding will first be screened by the trading company, and then by the RCF for final approval. Producers will repay in kind by delivering an agreed volume of their harvest.
 - Commodities will be negotiated through an online trading platform, to generate cash to repay the loans. The trading company will guarantee a minimum price to offtake the agreed volume and will have the right of first

⁷ The RCF will initially serve 100% of its crop financing to farmers that have restored already cleared lands between 2010 and the RCF start (2010-2018). Subsequently, crop financing will be also offered to those farmers that restored lands because attracted by the RCF credit lines. The amount offered to "new-restorers" will progressively increase over time in relation to the total, reaching 100% of crop financing by 2029.

- refusal if higher prices are offered. Producers would be free to negotiate as they wish on any surplus to the agreed volume required for loan repayment.
 - o All commodities produced will be recorded in a blockchain registry that will keep track of ownership of volumes and title, allowing for the traceability of the commodities along the supply chain.
- **An Environmental Committee**, formed of representatives from the different groups of stakeholders involved (including producers, commodities buyers, local NGOs, and financial partners) **will oversee operations of the RCF**, provide guidance, and approve the eligibility criteria for financing.

Figure 1: RCF mechanics



2.2 PROJECT ELIGIBILITY & COMPLIANCE

The RCF will support producers that commit to its eligibility requirements and objectives. These were compiled based on the features and criteria contained in the current main international standards and certifications.⁸ Moreover, the RCF will be aligned with the recent Collaboration for Forests and Agriculture (CFA)'s Guidelines for Advancing Deforestation-Free and Conversion-Free Beef, Leather and Soy Supply Chains in the Brazilian Amazon and Cerrado (DCF Protocol).⁹ To ensure environmental integrity and benefits additional to the current baseline, the RCF will adopt stricter eligibility criteria (see Table 1) and, in effect, will act as a delivery mechanism for the objectives of the Cerrado Manifesto.

⁸ See Annex I for relevant standards and certifications.

⁹ WWF, 2018

Table 1: RCF's eligibility criteria for producers

Criteria related to the area of cultivation
<ul style="list-style-type: none"> To be compliant with RCF's eligibility criteria, farm land must be: i) cleared of native vegetation before 2008; ii) restored for soy (and/or corn) cultivation after 2010; No conversion of additional areas of native vegetation is allowed after joining the RCF. Compliance with the Forest Code:¹⁰ i) farm land must be registered with the Cadastro Ambiental Rural (CAR);¹¹ ii) in case of deficit of native vegetation for legal reserve or Permanent Protection Areas (APPs), the farmer must present a land restoration plan (PRADA) in conformance with the legal requirements of the state. The farm area must not overlap with conservation units, indigenous reservations, or community lands.
Criteria related to the farmers
<ul style="list-style-type: none"> The farmer must have the unquestionable right to use the land, be it as land title, land lease agreement or another legally recognized form of land tenure. The farmer must demonstrate that no environmental or legal requirements are contravened (such as embargoes, contraventions of the labor legislation, and non-compliance with the Soy Moratorium (if applicable)).

A number of processes and technologies will ensure that the eligibility criteria are met, monitoring is efficient, and transactions are transparent:

- **Blockchain technology** will be adopted to validate and store each transaction between producers and buyers.
- To provide information for buyers about the origins of sustainable soy, a **producer registry** will be developed, which will process applications and assess compliance.
- **A land bank** and registry will be created, to allow producers that do not own land in the region to join the RCF, by connecting them with landowners with excess land to sell.
- **Monitoring and traceability systems**, based on satellite imaging, remote sensing, and big data (in partnership with MapBiomas¹²) will be employed to continuously assess compliance of production, over time.
- To enable transparency, a **user interface** will be developed for public consultation.

2.3 INVESTORS TARGETED

To become operational, the RCF must raise commercial and concessional financing from different types of investors by issuing a number of green bonds.

The first green bond will finance the credit lines for crop financing for a cumulative amount of US\$ 300 million. It will be issued in the form of a 10-year European Medium-Term Note (EMTN) of US\$ 300 million by early 2019 (timeline is summarized in Table 3). The bond will comprise of different risk profiles (A, B, C) aimed at specific investors. The pricing of the coupons of the different tranches will be finalized later in the year.

¹⁰ The Brazilian Forest Code imposes mandatory limits on the proportion of native vegetation that can be legally cleared, requiring all rural landowners to maintain "Legal Reserves" and "Riparian forests" in their lands to protect water streams and native vegetation. This amount varies between 20 to 80% depending on the biome. In the Cerrado it ranges between 20 and 35%. Moreover, the Forest Code uses the cut-off date of 2008 to give amnesty (therefore avoiding penalties) to those landowners that illegally deforested their land according to the law that prevailed at the time.

¹¹ See: <http://www.mma.gov.br/mma-em-numeros/cadastro-ambiental-rural>

¹² See: <http://mapbiomas.org/>

Table 2: Structure of the RCF bond for crop financing

Tranche	Amount (US\$)	Targeted Investors
C (first loss)	15 million	Provided by the partnering trading company, to ensure alignment of risks and objectives
B (subordinated)	60 million	Grant and concessional finance providers (DFIs, impact investors, family offices, endowments)
A (senior)	220 million	Commercial investors (institutional investors, pension funds, hedge funds)
Equity	4 million	Contributed by proponent and partners

Note: coupon rates are still being discussed.

Subsequently, other issuances will be made with different trading partners and focuses. For instance, a second bond type will be issued to set up credit lines for land restoration, collateralized for soy production. It is expected that this will be in the form of 6-year loans for the additional costs of land restoration (land preparation, fertilizers), with a 3-year grace period and 3 years for repayment.

The bonds will be issued by an SPV trust and managed by a corporate service provider (CSP). Its proceeds will be collected into an escrow account in the name of the trust managed by the selected bank. SIM will approve the funding to the selected investment, which is represented by the collateralized loans originated and managed by the trading company.

2.4 STRATEGY TO PHASE OUT PUBLIC FUNDING

Once the bonds are issued, the RCF will not depend on public funding - **the facility is expected to sustain itself through collection of fees starting from the first year of operations.**

The RCF's managing company will collect fees from the producers enrolling in the facility, through subscription to the land registry, and from the transaction fees on the soy sold through the exchange. In addition, operational funding will come from the debt fund's net margin and performance fees, which are paid at the end of each year based on the successful capital invested and repaid.

The proponent is currently working to secure US\$ 15 million from its partnering trading company to absorb potential initial losses. Additionally, **up to US\$ 5 million in grants**, from public and private sources (philanthropic organizations, foundations) and **up to US\$ 60 million subordinated debt¹³ and guarantees** for the second loss tranche would contribute to enhancing the credit rating of the bonds and reduce its cost of capital. In turn, this would greatly increase the Facility's competitiveness of the fund on the lending market to producers. Bondholders will be linked to the RCF for up to 10 years (length of notes issued), after which the concept can be replicated without public or concessional backing.

¹³ As per the proponent's latest communication, some funding has already been preliminarily secured.

3. INNOVATION

Using a unique combination of financing instruments, eligibility criteria, and traceability systems supported by blockchain technology, the RCF will supply international markets with a different class of soy that is not linked to deforestation in the Brazilian Cerrado.

3.1 BARRIERS ADDRESSED: ACCESS TO FINANCING FOR FARMERS AND INCREASED TRANSPARENCY FOR BUYERS

The instrument addresses key barriers that are preventing agricultural expansion into unproductive, cleared lands in the Cerrado, and, more generally, the global trade of sustainable commodities:

- **Barrier:** There is limited access to financing and technical assistance for agricultural producers to cultivate in already-cleared lands, especially for small and mid-sized producers. **Response:** The RCF will provide credit lines and loans for land restorations¹⁴ with lower interest rates and longer timeframes (described in the next section) than existing credit lines. Additionally, the RCF will provide technical support and expertise for restoring lands and, at a later stage, financing for on-farm infrastructures (i.e. silos).
- **Barrier:** International buyers lack information about origin and the criteria used for tracing and screening sustainable soy. **Response:** The RCF will feature registries, tools, and software aimed at improving the transparency of the whole mechanism. Blockchain will be a key part of these processes.
- **Barrier:** No sales of sustainably produced soy are guaranteed from 'market-maker' buyers. **Response:** The RCF will create a sustainable soy exchange for sales of soy not associated with any deforestation, including legal, happened after 2008. The exchange will have storage facilities that will allow single producers to aggregate their production and reach volumes needed to attract international buyers.

3.2 INNOVATION: ELIGIBILITY CRITERIA AND TRACEABILITY SYSTEMS THE RCF CONCEPT COMBINES A RANGE OF INNOVATIVE FEATURES:

- The facility's eligibility criteria require that **producers must commit to halting deforestation**, including legal deforestation, and engaging in **full compliance with the Forest Code**. Many traditional lines of credit and financing reviewed¹⁵ (including from trading companies) do not incentivize soy cultivation in cleared lands or discourage production in legally deforested lands, so this presents a new approach.
- Moreover, the RCF will select its clients through a two-step process, with a first screening performed by the trading company, and then a second by the RCF for final approval. Compared to the approach of some other comparable initiatives,

¹⁴ In August 2018, Bunge, Banco Santander and The Nature Conservancy announced a new financing instrument for soy farmers in the Cerrado, which is highly complementary to the RCF's credit lines and similar to the RCF's intended restoration loans. A US\$ 50 million pilot is designed to promote agricultural production without further deforestation or conversion of native vegetation, by providing long-term loans to farmers willing to commit to this approach (TNC, 2018).

¹⁵ See Annex III for a detailed list of comparable credit lines

for example the &Green Fund¹⁶ and the Africa Agriculture and Trade Investment Fund (AATIF)¹⁷ which provide funding to financial institutions or supply chain companies to on-lend to farmers, the RCF approach provides a better option to oversee the final investment decision.

- The **financing terms offered to producers combine an attractive mix of longer terms and lower interest rates** than most of the financing options that are normally accessible for agricultural production into the degraded lands in Brazil.
 - **RCF crop financing** lines will offer low interest rate loans to be repaid in up to 12 months. On average, traditional government's credit lines may require 8 - 10% interest rates (private ones may be even higher) and shorter repayment period (10 months).¹⁸
 - **RCF restoration loans** will offer low interest rate loans with up to 10 years repayment.¹⁹
- Blockchain technology will be employed to track and monitor sustainable soy production as well as record all transactions. This will create higher transparency and security of stored information.

3.3 CHALLENGES TO INSTRUMENT SUCCESS

The RCF will have to face several challenges to achieve its goals, and the proponent has strategies in place to manage them. These include:

- **Achieving recognition by key stakeholders** to finance and commercialize the production of sustainable soy. This means not only ensuring the buy-in of investors, lending communities, donors, and ultimately buyers, but also the interest of producers. To manage this, the proponent has been reaching out to investors and buyers and conducted a field survey to understand interest from producers.
- **Demonstrating that it is redirecting soy production towards cleared lands** through its set of incentives, and that it is not leading to deforestation leakage in other areas, or financing producers that have deforested after 2008. In this sense, the registry of producers, and the monitoring and traceability tools will play a key role.
- **Risk of farmers defaulting on loans** due to under or non-performance. To limit its exposure and increase leverage, the RCF's crop financing will only cover up to 30% of each farmer's costs of production, with the remainder financed by the farmers' own capital and other public or private local sources of finance. The proponents are considering the use of a loan guarantee and securing first loss and mezzanine layers (C, B bond tranches) to minimise any potential loss to senior tranche bondholders.
- Ensuring that the **costs deriving from the instrument's innovative features are financially sustainable**, even without a price premium for the sustainable soy produced. Securing grants and subordinated capital will be key to ensuring the financials allow for all the features.

¹⁶ See: <http://www.andgreen.fund/>

¹⁷ See: <https://www.aatif.lu/home.html>

¹⁸ Average cost of financing and tenor from Brazilian financial institutions (IMEA 2018), used in the financial model.

¹⁹ See Annex III for a detailed list of comparable credit lines and rural financing instruments.

MARKET TEST AND BEYOND

4. IMPLEMENTATION PATHWAY AND REPLICATION

In 2019, the RCF plans to issue its first bond of US\$ 300 million. Proceeds will support soy farmers in the Brazilian states of Goiás, Mato Grosso, and Mato Grosso do Sul.

4.1 TARGET GEOGRAPHY

With a 10-year plan starting in 2019, the RCF concept will initially be piloted in soy cultivation in the ecological region of Brazilian Cerrado. The region extends through multiple Brazilian states and is the most biodiverse savannah in the world. With 11 types of vegetation, the Cerrado is a fundamental region for biodiversity, energy, and water. In recent years, the region has seen high rates of deforestation, outpacing that of the Amazon rainforest, as a result of agricultural expansion. Soy accounts for 90% of the crops cultivated in the Cerrado, at about 15.6 million hectares.²⁰

Most of the farmers funded by the RCF will be in the states of Goiás (GO), Mato Grosso (MT), and Mato Grosso do Sul (MS). Goiás, in particular, represents a suitable location to introduce the RCF due to a number of factors: i) availability of cleared lands that are suitable for soy plantation, ii) presence of local experienced soy producing farmers, iii) existing infrastructures to store and channel production.²¹

4.2 IMPLEMENTATION TIMELINE

In Q2 of 2018, the proponent, BVRio, incorporated the Sustainable Investment Management (SIM) company, the organization responsible for managing the RCF as a whole.²²

By early 2019, the proponent aims to issue the first US\$ 300 million note for the crop financing bond on the International Securities Market of the London Stock Exchange. The bond proceeds will be placed with farmers for soy and corn cultivation over the first six months of 2019.²³ During the months before the issuance, SIM will conduct the typical preparatory operations and fine-tuning, as well as outreach to potential investors for the subordinated and senior tranches. In this period, the bond will receive its rating, pricing and green bond certification according to a new land use module created by the Climate Bonds Initiative.²⁴ In parallel, the proponent will disclose the identity of the first partner trading company.

²⁰ CDP, 2018

²¹ However, the Brazilian Cerrado extends to the states of Tocantins and part of the states of Maranhão, Piauí and Bahia. Collectively, these represent a region called Matopiba, where land is cheaper and where most of the Cerrado deforestation is currently occurring (CDP, 2018). Matopiba was debated during the working group discussions as a possible better focus for the pilot, over the GO, MT, and MS states. Distance from the deforestation "frontier" was, perhaps, the major reason to avoid the Matopiba region, in order to avoid a potential rebound effect (Strassburg, B. et al., 2017) due to increased economic activity in the hotspot area, due to the presence of the RCF credit lines.

²² Founders of BVRio have over 25 years of experience on forestry, climate carbon trading, and finance. The President of BVRio, Pedro Moura Costa, previously founded EcoSecurities Group Plc., the world leader in greenhouse gas mitigation and carbon trading, listed in the London AIM Stock Exchange.

²³ Since 2000, to increase their productivity farmers in Cerrado have increasingly adopted a practice called "double cropping" (sequentially growing and harvesting two commercial crops per year on the same land), where a second crop that is usually corn (called safrinha in Brazil), is planted after soy (Kastens et al, 2017).

²⁴ See: <https://www.climatebonds.net/standard/land-use>

This first RCF bond will last 10 years, ceasing operations in 2029. The proponent is planning on future tranches, including financing for land restoration and for other aspects of the soy supply chain.

Table 3: RCF implementation timeline

Event	Date
Constitution and fundraising for SIM	Jul-18
Trustee/Fiduciary/Underwriter agents defined	Aug-18
Refinement of CF bond structure	Sep-18
Present RCF at the London Innovation Summit	Sep-18
Outreach to investors (preliminary roadshow)	Oct-18
Further bond refinement	Oct-18
Bond rating by credit rating agency	Oct-18
Pricing of bond	Oct-18
Second outreach to investors	Nov-18
First US\$ 300 million bond issued	Jan-19

The RCF has already received indications of support from investors and other relevant stakeholders, in particular:

- **Investors**, including financial institutions, governments, and foundations have expressed interest in funding the RCF.
- **Citi Corporate Trust** will be the bond issuer and **Baker McKenzie** is legal counsel.
- Bonds will be certified to the new land use standard of **Climate Bonds Initiative**.
- **Providers of externalized services**, like the IT company tasked to set up the blockchain infrastructure, are already working with the proponent.
- The proponent has worked closely for several months with a leading **trading company** operating in Brazil, whose name will be disclosed soon.
- **International buyers** have expressed interest in buying the soy sold through the exchange and **400 famers** have expressed interest in the RCF.
- Some of the abovementioned organizations will join the **Environmental Committee**.

4.3 IMPLEMENTATION CHALLENGES

The timeline depicted will face near and longer-term challenges, the most relevant include:

- **Investor profiling:** The proponent aims to attract conventional institutional investors looking for an investment grade product but creating the right conditions to attract them could be challenging. To credit-enhance the financial structure of the bond, other investors will need to bear higher risks. This includes the trading company, which will subscribe to the first loss tranche, and other actors (DFIs, impact investors, family offices) that should contribute subordinated debt or concessional finance (part of it is already preliminarily secured). Grants and guarantees would further improve the credit rating.
- **Ambitious timeline:** The RCF aims to place its first bond tranche by early 2019 and start placing US\$ 300 million of credit lines in the following six months.
- **Some financial details are still being discussed:** These include the exact returns for bondholders and the interest rates of crop financing lines.

5. IMPACT

Over 10 years, the RCF has the potential to generate a cumulative US\$ 3 billion in loans to 600 farms. This would originate over US\$ 20 billion worth of soy and corn produced without incurring deforestation, restoring 1.2 million hectares of land and avoiding over 55 million tonnes of carbon emissions.

By discouraging further expansion of agricultural land for soy production in the Brazilian Cerrado biome, the RCF will contribute to reduced deforestation of native Cerrado vegetation, as well as the climate, ecosystem, and biodiversity impacts that are associated with deforestation.

5.1 QUANTITATIVE MODELLING

With the US\$ 300 million raised through the first bond issuance, **the RCF aims to channel low cost loans to approximately 600 farms in the Cerrado, for a cumulative lending amount of more than US\$ 3 billion over 10 years.** According to the proponent, who conducted an early stage field survey, 400 farmers have already expressed interest in the RCF and in potentially accessing the credit lines. In turn, the credit line seeks to originate over US\$ 20 billion worth of sustainable soy and corn by 2029, with potentially US\$ 2 billion produced in just the first year of operations.

To better understand how the risk of default from producers would impact the bondholders' returns, the Lab team conducted a sensitivity analysis. Assuming interest rates of 3.5%, 5% and 7.5% for the senior, subordinated and first loss tranches respectively, the analysis produced the following results:

- The A tranche (senior) will not be impacted by any default level smaller than 2% and will keep producing positive returns in almost any default scenarios tested.
- The B tranche (subordinated) starts being impacted after a 1% default level and produces zero returns when the default level is 5.5%.
- The C tranche (first loss – for this exercise considered US\$ 5 million as initially communicated by the proponent) absorbs the highest impacts, but produces zero return at a 1.5% default level.

The historic default rates experienced by the trading company are less than 0.5%, hence a 1-2% default level already represents a pessimistic scenario. Furthermore, the first loss tranche will be purchased by the trading company, demonstrating alignment of risks with the Facility and that the expected default rates remain as low as historical series.

5.2 ENVIRONMENTAL & SOCIAL IMPACT

Cumulatively, the RCF has the potential to restore 1.2 million hectares of land (nearly the size of Montenegro) and avoid and sequester up to a total of 55 million tonnes of carbon emissions over its first 10 years of operations (2019-2029). Every US\$ 10 invested in the RCF will avoid 18 tonnes of carbon emissions. The emission reduction potential originates from three processes, described in Annex III and summarized below:

Table 4: Summary of emission savings through the RCF

Process	Carbon emission savings imputed to RCF (in million tonnes of CO ₂)
Avoided conversion of Cerrado forests	27.2
Increased storage of Co ₂ in restored cleared land	17.1
Carbon sequestration in newly created legal reserves	11
Total	55.4

Reduced deforestation and the creation of new legal reserves of original vegetation will also improve biodiversity in the region as well as its resilience to climate and weather events (i.e. reduced vulnerability to wildfires, flooding, etc.).

Alignment with the main international standards and certifications for sustainable soy means that the instrument will fully comply with labor standards (like exclusion of forced, slave and child labor), human rights and other relevant social conditions for those farmers and the labor force that will be financed by the facility.

5.3 REPLICATION POTENTIAL

Since 2013, Brazil has been the world's top soybean exporter. Demand for Brazilian soy has dramatically increased since 2000 due to booming demand from China, by far the largest consumer of soy. The recent tariffs that China imposed on U.S.-sourced soy (the world's second largest exporter) may further accelerate demand for Brazilian soy,²⁵ with exports expected to increase by more than 40% in the next 10 years.²⁶

At the same time, international commitments and declarations towards zero deforestation in supply chains demonstrate that there is (and increasingly will be more) global appetite and demand for sustainably sourced soy (see Annex IV). While certified soy can be limited in supply (globally, 2.2% of global soybean cultivation is certified sustainable²⁷), RCF can provide a much higher volume of sustainable soy that companies and buyers will be increasingly looking for.

To combine pressure from agricultural expansion with the Brazil's pledge to restore up to 12 million hectares of forests and 15 million hectares of degraded pastures by 2030,²⁸ it is crucial to increase the production of sustainable soy without contributing to further deforestation. Currently, Cerrado as a whole has more than 40 million hectares available of degraded lands, mostly concentrated in the areas of Goiás, Mato Grosso, and Mato Grosso do Sul. This is projected to increase by 2030 if action is not taken. The RCF plans to promote the regeneration of 1.2 million hectares of cleared lands by 2029, and if its concept is proven successful over its first 10 years, it could be expanded in Brazil or replicated for other commodities and regions. The proponent is already planning expansions in scope and scale.

²⁵ Bloomberg, 2018.

²⁶ Agroconsult 2018.

²⁷ Lemoud et al. 2018.

²⁸ NRDC and Observatorio Do Clima. 2017.

6. KEY TAKEAWAYS

The Lab's analysis of the RCF conclude the following:

- **Innovation:** The RCF is a debt fund that will provide attractive financing lines to soy production not associated with deforestation after 2008, combining lower interest rates and longer repayment terms than most existing alternatives. Commodities produced will be sold to international markets in a dedicated selling platform linked to a blockchain registry. Production and compliance with the eligibility criteria will be constantly monitored by employing a range of traceability systems.
- **Financially sustainable:** The RCF is expected to sustain itself through collection of fees starting from the first year of operations. Financing will be raised by issuing risk-adjusted investment grade-rated green bonds, primarily aimed at institutional investors. The proponent is currently working to secure US\$ 15 million to absorb potential initial losses, and would require up to US\$ 5 million in grants and up to US\$ 60 million in subordinated debt to enhance the credit rating of the bonds.
- **Catalytic:** The RCF has the overall potential to avoid up to 55 million tonnes of carbon emissions over 10 years. With US\$ 300 million raised through an initial green bond, the RCF will channel over US\$ 3 billion of cumulative crop financing, originating over US\$ 20 billion worth of soy and corn that are not related to deforestation, corresponding to 1.2 million hectares of restored land. The RCF is already planning expansions in scope and scale.
- **Actionable:** BVRio, the proponent, has an established track record and implementation capacity, with key stakeholders already engaged in financial and environmental advisory positions. In addition, the workplan is already being met with some funding already preliminarily secured and plans to issue the first bond tranche by early 2019. An initial survey has showed interest from hundreds of potential farmers to access the credit lines.

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8. ANNEXES

8.1 ANNEX I – EXISTING STANDARDS FOR RESPONSIBLE SOY

There are various certifications/guidelines/standards that exist relating to responsible soy production and sourcing. These initiatives offer certifications or establish standards to communicate responsible production or sourcing and improve agricultural best practices/reduce deforestation.

Zero-Deforestation Standards				
Standard	Details	Content	Timeline & Cut-off date	Specific language deforestation
Roundtable on Responsible Soy (RTRS) Standard for Responsible Soy Production²⁹	Standards/Certification (voluntary). Has approved Accreditation Bodies & recognized Certification Bodies. Audits carried out by RTRS Qualified Lead Auditors	Requires that ""Expansion of soy cultivation is responsible""; based on RTRS maps/ native landscapes	May 2009 onwards, no land cleared or converted on areas where RTRS maps are available/native areas/traditional lands. After June 2016, no conversion at all on any natural lands/protected areas	"No conversion"
Consumer Goods Forum (CGF) Soy Sourcing Guidelines³⁰	Standards that support GCF member companies to meet CGF 2010 Zero Net Deforestation Resolution. No certification	"Recommendations on how to address deforestation and other key sustainability issues associated with the production of soy"	Soy Sourcing Guidelines recommendation: "Require suppliers to source deforestation-free sustainable soy no later than 2020"; Conversion cut-off date of 2009	"Deforestation-free"; zero net deforestation
European Feed Manufacturer's Federation (FEFAC) Soy Sourcing Guidelines³¹	Certification/Set of criteria. Not new standards. Produced with ITC & UN WTO. Requires independent 3rd party accreditation. Self-assessment tool	"Expansion of soy cultivation is responsible"; For essential criteria: farmer complies with relevant legislation/laws. No soy is produced on illegally deforested land after cut-off date mentioned in national legislation	Cut-off date is based off of national legislation (i.e. Brazil-2008)	N/A- "Farmer complies with legislation relevant"
Pro Terra Standard/ Certification for Sustainability³²	Certification based on Basel Criteria for Responsible Soy. Uses independent third-party certification	Native vegetation and HCVA cannot have been cleared/ converted after 2004. Local regulations and international conventions must also be adhered to	No cleared land or conversion of native vegetation/HCVA after 2004	"Cannot have been cleared or converted"
International Sustainability & Carbon Certification (ISCC Plus)³³	Broad certification scheme that has processes and certifies several supply chains, including soy	The production on land in or after January 2008 is not allowed, regardless of whether or not the land has preserved its status but complies with local laws	No conversion after January 2008	"No conversion"

²⁹ <http://www.responsiblesoy.org/?lang=en>

³⁰ <https://www.theconsumergoodsforum.com/initiatives/environmental-sustainability/key-projects/deforestation/soy/>

³¹ <https://www.fefac.eu/file.pdf?FileID=65744>

³² <http://www.proterrafoundation.org/>

³³ <https://www.iscc-system.org/>

8.3 ANNEX II – COMPARABLE CREDIT LINES & MARKET POSITIONING

Various lines of rural credit do exist in Brazil, but none offer the rates and timeframes that RCF will offer. Moreover, many of the credit lines offered for environmental sustainability do not incentivize soy production in cleared lands. Others finance activities in legally deforested areas.

Comparable Credit Lines & Market Positioning			
Program/Source	Description	Conditions for Financing	Comparison
Programa Nacional de Fortalecimento da Agricultura Familiar – PRONAF³⁴	Part of the Brazilian Rural Credit Program. Annual allocation of subsidized funds for land-use related activities. PRONAF finances activities that increase productivity of smallholder farms	Rate: 0.5%-5.5%. Limit: R\$ 250,000.00 (cost) and R\$ 330,000.00 (investment)	Cap on amount per producer. Finances activities in legally deforested areas. No requirements for low-carbon agricultural practices. No incentives for producing in cleared lands.
PRONAF ECO³⁵	Part of the Brazilian Rural Credit Program. PRONAF ECO finances smallholder farmer investments related to renewable energy and environmental sustainability	Rate: 2.5% per year for smallholder farm production in compliance with environmental legislations, up to 10 years Limit: R \$165,000	Finances low carbon agricultural practices but contains a cap on amount per producer. Specifically for smallholders.
Programa Nacional de Apoio ao Médio Produtor Rural – PRONAMP³⁶	PRONAMP supports medium size farms	Rate: 8.5%, up to 8 years Limit: R\$ 1.5 million (cost) and R\$ 430 million (investment)	Cap on amount per producer. Finances activities in legally deforested areas. No requirements for low-carbon agricultural practices. No incentive for producing in cleared lands.
FNE Verde³⁷	Part of the Brazilian Rural Credit Program. Financing for land use related activities including environmental restoration and recuperation of degraded areas	Rate: 8.53%, up to 12 years Limit: 90-100% of investments, depending on the loan Beneficiaries: Rural producers, agricultural cooperatives and associations, industrial and commercial enterprises	Finances low carbon agricultural practices but does not target soy cultivation in already cleared lands. Cap per producer.
Low Carbon Agricultural Program (Programa para Redução da Emissão de Gases de Efeito Estufa na Agricultura- ABC)³⁸	Part of the Brazilian Rural Credit Program. Brazilian government subsidized program for low carbon agricultural practices	Rate: 8.0% per year, up to 12 years Limit: R\$ 2.2 and R\$ 5 million Beneficiaries: Rural producers and cooperatives	Finances low carbon agricultural practices but does not target soy cultivation in already cleared lands. Finances activities in legally deforested areas. Cap per producer. No incentive for producing in cleared lands.
Brazilian Agribusiness Financial Instruments	CPR (Cédula Produtor Rural), LCA (Letra Crédito Agro), CDCA (Certificado Diretos Creditórios do Agronegócio), CRA (Certificado Recebíveis do Agronegócio), ACC/ACE (export finance)		Although all such instruments enable financing of agricultural practices with production as collateral, interest rates can be quite high, no premium or incentive (nor requirement to) for sustainable production, ACC/ACE limited to 18 months
Bunge, Banco Santander, TNC Loans (forthcoming)³⁹	The program is designed to promote agricultural production without further deforestation or conversion of native vegetation, by providing long-term loans to farmers willing to commit to this approach	Up to 10 years loans	Complementary to RCF's credit lines.

³⁴ <https://www.bndes.gov.br/wps/portal/site/home/financiamento/produto/pronaf>

³⁵ <https://www.bndes.gov.br/wps/portal/site/home/financiamento/produto/pronaf-eco>

³⁶ <https://www.bndes.gov.br/wps/portal/site/home/financiamento/produto/pronamp-investimento>

³⁷ <https://www.bnb.gov.br/programa-de-financiamento-a-sustentabilidade-ambiental-fne-verde>

³⁸ <http://www.agricultura.gov.br/assuntos/sustentabilidade/plano-abc/plano-abc-agricultura-de-baixa-emissao-de-carbono>

³⁹ <https://www.nature.org/en-us/explore/newsroom/bunge--santander-brasil-and-tnc-to-offer-soy-farmers-long-term-l/?redirect=https-301>

8.4 ANNEX III – RCF EMISSION REDUCTION POTENTIAL

The RCF will generate emission savings through three different processes:

1. **Avoided conversion of Cerrado forests:** by providing low-cost and long-term crop financing to producers in Goiás, Mato Grosso, and Mato Grosso do Sul, the instrument aims to redirect their agricultural expansion into previously cleared and unproductive areas that are closer to their traditional areas. This would discourage them to migrate towards the Matopiba region, where most deforestation is happening. The avoided deforestation, attributed only to the availability of crop financing credit lines, is estimated to generate 27.2 million tonnes of CO₂ savings over 10 years.
2. **Increased storage of CO₂ in restored, cleared land:** upon restoration of their lands, farmers will introduce best practices in land maintenance and cultivation to increase the organic soil matter, and therefore, the amount of CO₂. As 70% of the CO₂ in Cerrado is stored in the soil, the potential impact is significant, estimated as 17.1 million tonnes in CO₂ savings. Compared to a baseline scenario of degrading soil, this corresponds to 1.2 million ha, regenerated over 10 years (2019-2029).
- **Carbon sequestration in newly created legal reserves:** the Brazilian Forest Code requires that all rural properties in the country maintain a certain amount of the native vegetation (20-80% of total, varies on location). Those that do not have sufficient amount of land can comply in different ways, including by regenerating portions of their own land, or by purchasing credits or privately held land for conservation. The proponent conservatively estimates that the farmers restoring lands for cultivation will also opt for regenerating part of these lands to the original Cerrado vegetation⁴⁰, for a total 190,000 ha over 10 years, saving 11 million tonnes of CO₂.

Overall, emission savings from the three processes is summarized in the table below:

Summary of emission savings through RCF

Process	mtCO ₂ e savings imputed to RCF ⁴¹
Avoided conversion of Cerrado forests	27.2
Increased storage of Co ₂ in restored cleared land	17.1
Carbon sequestration in newly created legal reserves	11
Total	55.4

⁴⁰ Assuming that 80% of the restored lands, previously unproductive pasture lands, do not currently have legal reserves and will be required to institute legal reserves on 20% of the farmland.

⁴¹ As Cerrado is a large region, comprising of multiple biomes, the processes adopt different assumptions of carbon concentration per hectares.

8.5 ANNEX IV – ZERO DEFORESTATION COMMITMENTS

Companies, governments, and NGOs alike have committed to zero deforestation practices, signing various global declarations and commitments. Many of these commitments relate to eliminating certain products and practices from supply chains, including agricultural products such as soy.

Zero-Deforestation Commitments: Alliances, Coalitions and Declarations				
	Details	Content	Timeline & Cut-off date	Specific deforestation language
Consumer Goods Forum (CGF) Zero Net Deforestation Resolution⁴²	400 large companies, w/ global sales of US\$ 3 trillion	Aim to achieve zero net deforestation supply chains by 2020 through the responsible sourcing of key commodities; "Prohibit production on land and areas designated by law with a conversion cut-off date not later than 2009 or later where sufficient mechanisms are in place to ensure the protection of priority areas"	By 2020; Conversion cut-off date 2009	"Zero net deforestation", "deforestation-free supply chains"
2014 New York Declaration on Forests⁴³	Non-legally binding; 109 companies endorsed	Cut natural forest loss in half by 2020, and strive to end it by 2030; Recommends companies to "commit to eliminate deforestation from their supply chains, including third party suppliers, as soon as possible, and collectively by no later than 2020"	1/2 deforestation by 2020, end it by 2030	"End forest loss"; eliminate deforestation"
Cerrado Manifesto (2017)	74 companies signed (including CGF members)	Aims to promote more resilient agriculture and land planning practices in the region; Calls for "immediate action in defense of the Cerrado"	No cut off dates	No language for eliminating deforestation
Soft Commodities Compact⁴⁴	Banking Environment Initiative; Based on CGF	Mobilize resources within their respective businesses to help achieve zero net deforestation by 2020	By 2020	"Zero net deforestation"
Tropical Forest Alliance 2020⁴⁵	Public-private partnership; voluntary	Seeks to address deforestation caused by forest-risk commodities; Help achieve GCF zero net deforestation by 2020	By 2020	CGF language
We Mean Business Coalition⁴⁶	53 companies committed	Remove commodity-driven deforestation from all supply chains by 2020; incentivize agricultural expansion onto degraded lands, supply chain traceability	By 2020	"Remove deforestation from supply chains"
Collaboration on Forest and Agriculture (CFA)⁴⁷	Drafted with NWF, TNC, WWF, Moore Foundation	Guidelines for Advancing Deforestation-Free & Conversion-Free Supply Chains in Brazilian Amazon & Cerrado (DFC Protocol)	N/A	"Deforestation free", "Conversion free" (conversion free for Cerrado)
Initiative 20X20⁴⁸	Country-led, WRI	Restore 20 million hectares of land in Latin America and the Caribbean	By 2020	N/A

⁴² <https://www.theconsumergoodsforum.com/initiatives/environmental-sustainability/key-projects/deforestation/>

⁴³ <http://www.un.org/climatechange/summit/wp-content/uploads/sites/2/2014/07/New-York-Declaration-on-Forests-E2%80%93Action-Statement-and-Action-Plan.pdf>

⁴⁴ <https://www.cisl.cam.ac.uk/business-action/sustainable-finance/banking-environment-initiative/pdfs/the-bei-and-cgfs-soft-commodities-compact.pdf>

⁴⁵ <https://www.tfa2020.org/en/>

⁴⁶ <https://www.wemeanbusinesscoalition.org/>

⁴⁷ https://www.wwf.org.br/natureza_brasileira/reducao_de_impactos2/agricultura/agr_acoes_resultados/copy_of_colaboracao_para_florestas_e_agricultura_cfa__27062017_1949/

⁴⁸ <http://www.wri.org/our-work/project/initiative-20x20>