The Lab

Brasil Innovation Lab for Climate Finance

THE SOCIO-CLIMATE BENEFITS FUND

INSTRUMENT ANALYSIS
SEPTEMBER 2018

Socio-Climate Benefits Fund Facility

LAB INSTRUMENT ANALYSIS
September 2018

DESCRIPTION & GOAL —
The Socio-Climate Benefits Fund Facility aims to increase forest restoration and reverse small-scale deforestation in the Amazon by creating a prototype business that will invest in agroforestry systems in smallholdings, while sharing production with smallholders and also facilitating product sales.

SECTOR —
Land use/ Forestry/ Agriculture

PRIVATE FINANCE TARGET —
For the Company: concessional capital providers & equity investors
For the investment vehicle: Institutional investors, private equity investors, impact investors, concessional capital providers, forestry and conservation investors

GEOGRAPHY—
For proof of concept: Amazon region, Brazil
Scale-up: other Latin American countries addressing small scale deforestation

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

The authors of this brief are Tatiana Alves, Rosaly Byrd, and Felipe Borschiver.

The authors would like to acknowledge the following professionals for their cooperation and valued contributions including the proponents Luis Fernando Laranja (Kaeté Investimentos), Nathaniel Simon (Kaeté Investimentos), Otavio Ottoni (Kaeté Investimentos), Armando Pironel (Kaeté Investimentos), Osvaldo Stella (Iniciativa Verde), Felipe Faria (Partnership for Forests), Diogo Bardal (IFC), Iuri Soares (IADB), Tomas Lopes Teixeira (MIF-IADB), Arnd Alexander (GIZ), Rodrigo Freire (TNC), Claudia Nessi (BNDES – Fundo Amazonia), Julio Guiomar (BNDES - Fundo Amazonia), Walmir Ortega (Conexsus), Érico Rocha (Brazilian Finance Ministry), Alain Batista (WRI-Brazil), Evy Marques (Felsberg Advogados), Catherine Goldberg (US State Department), João Mangabeira (Embrapa), Carlos Alberto de Matos Scaramuzza (UFMG), Rogerio Manente (Socopa), Sabrina Molina (Socopa), Cláudia Pinheiro (Socopa), Philipp Hauser (Engie).

The authors would also like to thank Barbara Buchner, Ben Broche, and Maggie Young for their continuous advice, support, comments, and internal review.

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

Brazil has pledged to restore 22 million hectares of its degraded and deforested land, 5.6 million of which belong to smallholders in rural areas. These smallholders require access to long term finance and technical support to implement forest restoration activities, which would benefit them economically and help Brazil meet its NDC.

40 million hectares of land have been deforested and degraded in the Brazilian Amazon during the last 40 years. While the government introduced policy measures in the early 2000s that have made significant progress in reducing large-scale, illegal deforestation, the practice of small-scale deforestation (areas less than 50 hectares) continues to grow,[1] leaving small patches of "fish spine" shaped deforested lands, as seen from aerial images, throughout the Amazon.[2]

Deforestation in smaller land areas is especially challenging for authorities to enforce through satellite monitoring and equipment seizure because they are deforested gradually, mostly for subsistence needs. Further, once deforested, these lands are often poorly managed and have very low agricultural productivity. When smallholders are not able to meet their needs with their deforested, unproductive land, they sell it to "land speculators," or wealthier farmers. The new owners then consolidate these small patches of deforested lands into large, contiguous areas for low-productivity livestock production, before large industrial agriculture companies then consolidate them with commodity crops.[3]

Under the Paris Agreement, the Brazilian Government pledged to restore 22 million hectares of degraded and deforested land, an area roughly the size of the UK. Forest restoration will be the objective for 12 million hectares of that land. Brazil has also put forward a number of lines of credit, within their allocated annual funds, for the agricultural sector to finance forest reforestation, forest management, and agroforestry services.

However, when trying to tackle forest restoration, even with the possibility of income generation and the ability to be compliant with the Brazilian Native Vegetation Protection Law (old Forest Code) in small properties, credit lines are not enough incentive to adopt more sustainable production methods. While smallholders receive some technical assistance through government programs, it is not enough to scale up their investment in forest restoration, even when the smallholders are located in clusters of rural settlements where knowledge dissemination is easier.

The Socio-Climate Benefits Fund (SCBF) seeks to reverse small-scale deforestation by creating an economic incentive to pursue forest restoration and natural recovery through the implementation of sustainable agroforestry systems (SAFs): SAFS are land-use management systems that combine agricultural crops with trees, shrubs, and even pasture, generating social, economic and environmental benefits to smallholders.[4] SCBF will do this by providing long-term investments and trainings for implementing agroforestry systems in smallholders' land in the Amazon.

[1] Patches of land below 6,25has are undetected by the Brazilian Program that monitors deforestation in the territory, PRODES
[2] Typical small scale deforestation shape that looks like a fish spine when seen from above
[3] http://ipam.org.br/wp-content/uploads/2016/02/Desmatamento-nos-Assentamentos-da-Amaz%C3%B4nia.pdf
[4] https://www.fs.usda.gov/nac/practices/index.shtml

CONCEPT

2. INSTRUMENT MECHANICS

The Socio-Climate Benefits Fund will invest in a New Company that implements agroforestry systems in smallholder lands, where a portion of the products from these systems are owned by the smallholders, and jointly sold in local and regional markets, ultimately generating returns for investors.

2.1 OVERVIEW AND OBJECTIVES

The instrument consists of an investment vehicle that will raise funds initially from concessional capital providers, equity investors and philanthropic organizations, and become the main shareholder of a Newly Established Company (New Company).

This investment vehicle (or simply the Fund), which could be structured as an investment fund or SPV, will be the main shareholder of the New Company, raising resources from three main categories of investors:

- Grant providers such as philanthropic organizations, multi or bilateral organization or individual donors. Such resources will be used to set up the New Company, to put in place 5 to 10 initial pilot projects with pre-selected smallholders and pay for initial technical assistance
- Concessional capital providers, such as impact investors, multi or bilateral organizations and funds. This category of investor will provide patient capital in two tranches: a senior tranche and a mezzanine tranche to be re-paid in 10 to 15 years, at interest rates ranging from 7.5% to 10% and which will fund the operations of the New Company
- Equity providers, which will also fund the New Company's operations and will receive dividends in up to 20 years

As the main shareholder of the New Company, the Fund will receive back ongoing dividends from the New Company and will use these resources to pay back principal and interests to concessional capital providers according to each tranche re-payment schedule, and dividends back to the Fund's equity providers

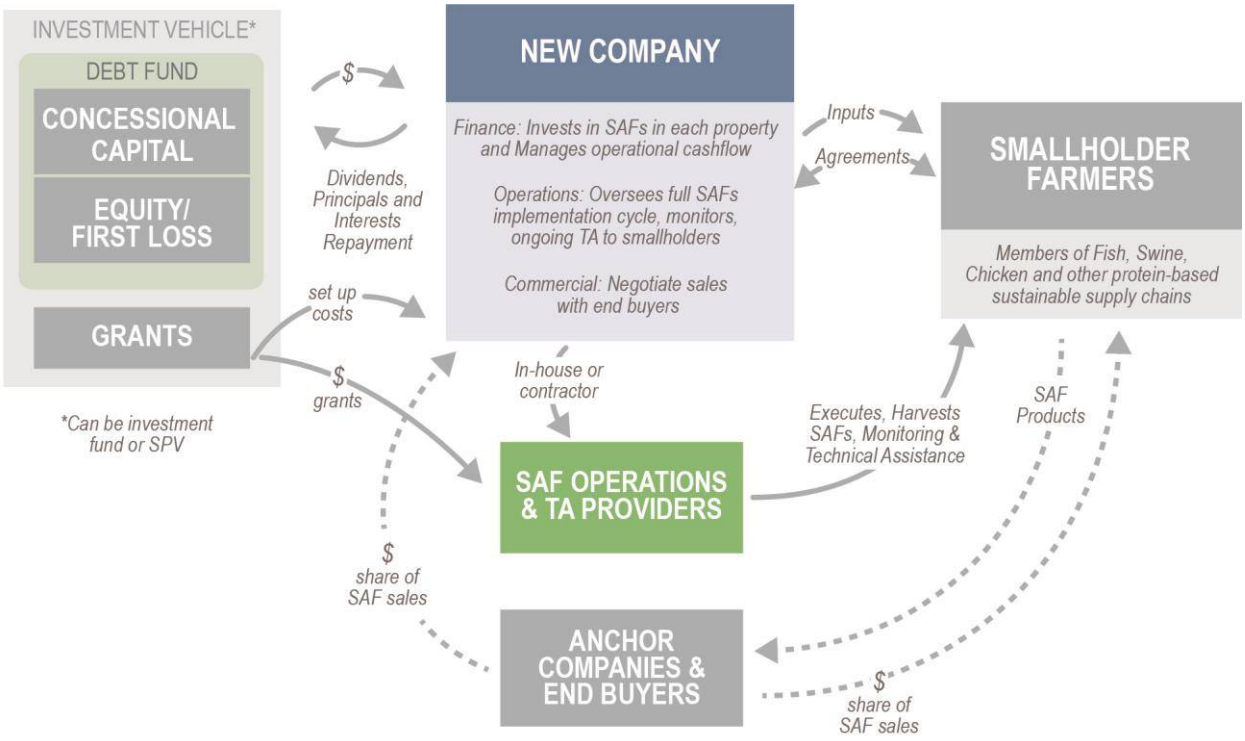
The New Company will be responsible for long-term agroforestry investments in smallholders' lands. The New Company will:

- Develop and implement a screening methodology to select smallholders eligible for agroforestry investments (see more in Section 2.2).[5]
- Enter into Rural Partnership Agreements (Agreements) with pre-selected smallholders, using a portion of their degraded landholdings as agroforestry systems, as defined for that area.[6]
- Engage the smallholders selected for the agroforestry investment, providing them with technical assistance to train them to implement, manage, and harvest crops in the areas under the Agreement.
- Provide all inputs (seeds, fertilizers, others), as well as logistics after harvest. At harvest, up to 30% of the harvest could be owned by the smallholder.[7]

[5] See more information on page 9-10
[6] Details of key features within the Rural Partnership Agreement will be included in the Annex section
[7] According to the Law that oversees Rural Partnerships in Brazil, smallholders should be "paid" in product(s).

- Select which crops will be grown using agroforestry systems. Crops will be selected based on market liquidity, storage capacity (if possible), adaptability to the region, and the existence of potential markets in the region for sale of such products. Cocoa, coffee, and acai berries are the initial "main crops" chosen for the instrument's initial cluster of smallholders in Acre. Banana and rubber trees will also be grown, called herein "support crops," to provide the shade needed by the other crops. Bananas as a support crop also provide a secondary benefit of generating earlier returns to smooth the system's cash-flows, while rubber trees have additional carbon sequestration benefits.
- Develop markets and collectively sell the shared agroforestry harvests to end buyers. At some point in time, the new company could, in fact, become an anchor company, becoming a local end-buyer for such products, and, as such, be the vertical integrator for this new agroforestry supply chain.
- Manage the overall operations cash-flows, paying back dividends to the investment vehicle.

Figure 1: Instrument mechanics



2.2 SMALLHOLDERS TARGETED

The Socio-Climate Benefits Fund will develop detailed criteria for targeted smallholders[8], which will include at least the following:

- Proven commercial track record: Smallholders must already be part of a "protein based" supply chain, with experience engaging with a company that provides them with income, and also looks for social and environmental indicators.
- Primary income for their subsistence needs: Smallholders who already have subsistence needs taken care of have a better credit risk condition to receive investments, with

[8] See key criteria in Annex section

greater ability to engage in a new activity with a longer return horizon that also diversifies their income sources.
- Compliance with the Brazilian Native Vegetation Protection Law or a commitment that the smallholder will use the instrument's resources to comply with this law through agroforestry implementation.

2.3 INVESTORS TARGETED

During the Proof of Concept Phase, the Socio-Climate Benefits Fund will be created and managed by a reputable investment management firm, that will also meet international criteria and standards. This investment vehicle (or simply the Fund) will be the main shareholder of the New Company, raising resources from three main categories of investors/fund providers:

- Private foundations and wealthy individuals that would (a) provide grants for setting up the New Company and (b) provide initial funds for smallholders' capacity (local labor), and development/technical assistance in implementing and cultivating agroforestry systems in their lands
- Concessional capital providers, such as multilateral and bilateral development banks and venture philanthropists, that would provide concessional capital, such as first and second loss capital tranches, to fund the New Company's operations and investments.[9] These investments will include the overall inputs needed, labor, logistics, distribution, and sales.
- Equity providers that, alongside with concessional capital providers, would fund the New Company's operations.

Together, the investors would provide the resources needed for the New Company to implement the program, provide capacity training, and sell the harvests co-owned by the Company and the smallholders. Once the New Company generates revenue, it will pay back principal, interests and dividends back to investors.

Once the instrument is set up, it aims to implement agroforestry systems in up to 100 smallholders' lands in an 18-month period. During this initial phase the instrument, the New Company (part of the instrument) will also be working to obtain offtake agreements for the harvests. It expects to implement agroforestry systems in at least 500 smallholders' lands in up to four years.[10] Further details of the company's first operations are in Section 3.

3. INNOVATION

The Socio Climate Benefits Fund is unique in adapting a business model widely used for poultry, swine, and farm fisheries to develop an integrated supply chain for agroforestry products, contributing to reverse 40 years of rural settlement deforestation trends.

3.1 BARRIERS ADDRESSED

The instrument's structure and business model address the main barriers preventing smallholders in the Amazon from widely adopting agroforestry systems as a forest restoration

[9] The recently re-launched BNDES FINEM lines of credit combined with resources from Brazil's Fundo Clima could be a potential option to finance the New Company that is being evaluated by the proponent as well: https://www.bndes.gov.br/wps/portal/site/home/imprensa/noticias/conteudo/bndes-anuncia-novas-condicoes-de-financiamento-para-restauracao-ecologica-e-economia-florestal/

[10] The initial goal of 500 smallholders is based in the commercial relationship that the proponent already has with them.

and Native Vegetation Protection Law compliance tool, as well as an economic activity that will provide significant income.

Table 1: Barriers addressed by SCBF

BARRIER	INNOVATION MECHANISM
Difficult access to long-term resources needed to finance agroforestry implementation	SCBF/New Company will provide the upfront and ongoing investments needed to implement agroforestry systems in smallholders' deforested lands, overcoming the need to develop a project and submit to financial institutions for long-term loans, which usually don't yet have the knowledge or willingness to do so.
Time gap between investing and selling the agroforestry-based products	Once offtake agreements are lined up, the SCBF/New Company will consider the possibility of buying the smallholders' production share prior to the harvests in order to provide them with income before sales, that can occur at least 3-4 years later.[11] The instrument will give smallholders the option of hiring them to implement the agroforestry systems in their lands, which provides them with additional income.
Lack of capacity and knowledge to implement agroforestry systems	As part of the hiring process described above, the SCBF will provide training,[12] on a "learning-by doing" basis framework where smallholders will be engaged in the implementation and management of co-owned "market-friendly" agroforestry crops.
Lack of access to markets and knowledge of market demand and price for agroforestry products, as well as limited leverage capacity to sell products individually	SCBF/New Company will serve as an aggregator, identifying and developing markets to collectively sell the agroforestry products to end-buyers and potentially obtaining better sale prices. The SCBF/New Company will invest in storage capacity to have the leverage capacity to store and sell products at times of better prices.

3.2 INNOVATION

The Lab Secretariat surveyed existing instruments and credit lines available to smallholders to invest in agroforestry systems. SCBF is somewhat unique in that it facilitates investments by adapting a vertical integration business model used in other agricultural sectors, applying this to agroforestry systems as a tool for forest restoration in smallholder lands in the Amazon.

The following table compares existing instruments to SCBF.

[11] The Rural Partnership Agreement, which is the legal instrument to be signed between the New Company and smallholders, is ruled by the legal framework "Estatuto da Terra". Such legal framework defines that smallholders should be paid their share of the partnership in products. As per the time when this report was written, there is still a pending legal consultation to check whether the New Company could purchase the smallholders' future harvests in advance

[12] It is foreseen that the service provider hired by the New Company, or the New Company itself, which will be the entity engaged with the smallholders in the "Rural Partnership Agreement, will engage and train the smallholders for the implementation of agroforestry systems in their lands

Table 2: Existing instruments compared to SCBF

EXISTING INSTRUMENT / APPROACH	DESCRIPTION	SCBF DIFFERENTIATION
PRONAF Credit Program (Pronaf Florestal or Agroecologia)	Brazilian Government Program of subsidized rural credit for small holders of up to 12 years at 4.5% p.a. interest rate.	SCBF will make long-term investments directly in smallholders' land, and does not require smallholders to borrow money from banks.
Low Carbon Agriculture Program (Programa ABC)	Brazilian Government subsidized lines of credit program for low carbon agricultural practices. Loans of up to 12 years and up to 6% p.a. interest rates	[same as above]
Moringa Fund	Private investment fund that targets large scale agroforestry systems projects in Latin America and Africa	A similar instrument to SCBF; however, it does not necessarily target smallholders based on already being part of some other supply chain that provides them with a first income. Also, unclear if Moringa transfers technical capacity for smallholders to expand production outside of the instrument's partnership
Amazon Fund	BNDES managed funds that provide non-recourse financing for climate friendly activities in the Amazon	To-date, provides grants only for agroforestry implementation, not investments or programs aimed at establishing commercial partnerships looking for returns, or putting in place structured supply chains specifically for agroforestry, complementing other existing supply chains, in rural settlements that could be replicable across the country

3.3 CHALLENGES TO INSTRUMENT SUCCESS

Challenges that SCBF will have to overcome to achieve success include:

- Farmer non-compliance/side-selling. Because there could be parallel monetary incentives that could cause smallholders not to manage crops well, or sell the entire crops to other parties, rural partnership agreements will carry penalties for non-compliance, and also be designed to potentially include bonuses for increased productivity. At a later stage, the New Company can also develop some form of participation for the smallholders in the New Company, so it's in their overall interest to be committed to the success and high productivity of the agroforestry systems and the New Company's increased returns. Moreover, as the New Company will hire and work together with smallholders to manage the agroforestry systems' crops, it will be continuously monitoring them.
- Non-performance of agroforestry systems, particularly due to limited growth or natural disasters / extreme weather. The New Company will monitor smallholders' plots and provide technical support when needed. However, even though the nature of this business carries the risk of weather events, agroforestry systems are implemented across

a range of separate properties, which increase geographic diversification, thereby reducing risk.[13]

- Lack of demand or low prices for agroforestry products. Diversification of agroforestry products with different harvest time frames and varying prices that will streamline cash flows and acts as a natural hedge. In addition, the three main crops are "commodity" based products (cocoa, acai berry, and cocoa in the case of the Acre clusters) will help to guarantee liquidity and revenue stability. Finally, the New Company intends to have a storage facility to stock production to sell the harvests at better times, if needed.

MARKET TEST AND BEYOND

4. IMPLEMENTATION PATHWAY AND REPLICATION

The Socio-Climate Benefits Fund Facility will initially target small landholdings that already supply protein-based products to companies owned by the private equity impact investment fund. In five years, the SCBF aims to invest in more than 1100 landholdings in different rural settlements in the state of Acre.

4.1 PILOT PROGRAM ELEMENTS

The proponent Kaeté Investimentos will begin operations in the state of Acre, where it has been working with smallholders' rural settlements for the last six years. Acre has an estimated two million hectares, and about 26,000 rural settlement projects.[14]

The proponent manages a private equity impact investment fund that has invested in companies to develop local "protein-based" supply chains that deliver social and environmental benefits to smallholders in rural settlements in Acre. Through these companies, the smallholders that once deforested their lands for subsistence needs stopped deforesting as they have switched to local fish, pork, and poultry supply chains, now the income source for their subsistence needs. However, they have left behind deforested patches or degraded forest remnants of lands within their properties that, in most cases, need to be restored or recovered to comply with the Brazilian Native Vegetation Protection Law.

The New Company will, therefore, be established in the surrounding area of Acre's capital, the municipality of Senador Guiomard, strategically located near the company "Peixes da Amazonia" (Amazonia's Fish).[15] The proponent has commercially engaged over the years with at least 500 smallholders in that region.

4.2 PILOT IMPLEMENTATION TIMELINE

The proponents aim to formally launch the New Company and kick off operations by July of 2019.

- **Present – July 2019: Pre-Launch Phase.** Prior to the formal launch, the proponent will continue its work on:

[13] As of the time when this report was written, we could not identify the possibility of some sort of existing insurance mechanism for purchase for this scale of Agroforestry investments

[14] http://www.agencia.ac.gov.br/wp-content/uploads/2011/10/downloads_zee_projetos_de_assentamentos_verso.pdf

[15] Reference to the BNDES Fund managed by Kaeté Investimentos: http://ipam.org.br/wp-content/uploads/2018/04/relato%CC%81rio-eng-v1-rec.pdf

- Mapping out key stakeholders in the region for additional learning and refining of the business model, but that could also be engaged with this instrument in various ways: service providers that would train smallholders and support the implementation of agroforestry systems, cooperatives, commercial companies, local buyers and others that could be potential off-takers and/or suppliers of key services throughout these supply chains, local instutions and banks that could advertise the opportunity for engaging in agroforestry supply chains;
- Securing a minimum of 10 smallholders, preferably that are engaged with one of the proponents' companies, and that have indicated strong interest in the new business model and are willing to engage before formal launch, and paving the way for greater engagement after launch
- Negotiating and signing a letter of intent with two potential off-takers for the cocoa, acai berries, and coffee production
- Designing the key criteria needed and vetting process to select the smallholders that would benefit from this new business model[16]
- Fundraising to obtain an initial grant to start the process with the initial 10 smallholders before the launch, and also with potential impact investors and development banks to provide equity and long-term concessional debt to invest in the instrument

- **July 2019 – December 2020: Launch & Phase IA.** The New Company will work to invest in agroforestry systems within the lands of up to 100 smallholders currently engaged with Peixes da Amazonia. They aim to replace four hectares of degraded lands with agroforestry, roughly 4% of their land,[17] which will likely surpass the overall restored area required to comply with the Brazilian Native Vegetation Protection Law.
- **January 2021- December 2023: Phase IB.** In the next three years, the New Company will expand its investments in agroforestry systems to at least 500 smallholders' properties in the regions where it operates Peixes da Amazonia.

  It is important to highlight that there is potential to invest in agroforestry practices in up to 2200 properties in the settlements surrounding Peixes da Amazonia.
- **From 2024 onwards: Phase II.** After four and a half years of operational success since launch, when markets to purchase agroforestry products from the southern part of Acre will have been developed and off-take agreements will be in place, the New Company will have started expanding operations to an additional 600 smallholders who have engaged in protein-based commercial relations with the companies established by the proponent: Dom Porquito and AcreAves.
- **8-10 years following Pre-Launch**: Following the successful implementation of agroforestry systems and the creation of consolidated markets to sell the products grown, up to approximately 3,000 properties, and 300,000 hectares of land, could be under compliance with the Brazilian Native Vegetation Protection Law, and 12,000 hectares of forests will be restored, solely through this instrument.

Moreover, after smallholders acquire the knowledge to implement agroforestry systems in their land, and with markets in place for their products, reforesting could occur at a much higher rate than what this instrument is targeting in each of these landholdings.

[16] See Annex for initial key criteria to select smallholders to enter in Rural Partnership Agreements
[17] For properties in the Amazon with area size below 4 fiscal modules, properties with likely 500 hectares or less, the requirement is to restore forests in up to 20% of the property.

4.1 FINANCING NEEDS

The amount of money required to establish the New Company and invest in the initial 500 properties through the end of 2023 (Phase I A and B), in an average of 4 hectares per property, is estimated to be R$ 71 million, or US$ 17.75 million, with a suggested ratio of 30% equity and 70% debt.[18,19]

An initial US$ 1.5 million of the US$ 17.75 million needed would come in the form of a grant from a private foundation or government sponsored program. This money will be used to:

(1) develop the investment fund's (or special purpose vehicle) legal structure and governance, due diligence, and put in place the 10 initial agroforestry projects [what, in practice, will constitute the Rural Partnership Agreements];

(2) hire and pay for technical assistance providers to teach smallholders how to implement agroforestry systems in their lands.

Thereafter, the remaining approximately US$ 16.25 million would come from concessional capital providers that would provide long-term debt/patient capital in the form of first and second loss capital, alongside equity providers to the New Company, to finance the remaining 490 projects estimated for Phase IA and IB.

For the second phase, comprising a future expansion in other rural settlement clusters with an additional 600 smallholders, **an additional approximate US$ 15 million would be required up to** five years after the New Company's launch.

4.1 PATHWAY TO SCALE

Given concerted efforts in Brazil by several organizations working with smallholders, the instrument can achieve scale in three ways:

- This model could work with a greater number of smallholders in rural settlements and other "protein-based supply chains," beyond the pool of smallholders with which the proponent has commercial relations with, or in settlements in Acre state only. For instance, the proponent has ongoing work with organizations in the states of Mato Grosso and Para that also work with clusters of rural settlements operating in established "protein-based supply chains."
- The proponent could reach out to medium properties, where owners are likely not complying with the Native Vegetation Protection Law due to the size of their properties,[20] and may be interested in "protein-based agricultural supply chains."[21]
- For greater scale, the model could be expanded by implementing a franchisor/franchisee system, provided that the franchisee systems will meet the necessary criteria, including:
    1. smallholders meet the key requirements to receive investments
    2. a local service provider is in place to implement the agroforestry systems in the smallholders' land, and to teach the technical skills needed
    3. the New Company identifies and engages with regional off-takers

[18] The average used for the model of 4 hectares of agroforestry per property comes from the premise that it's the number of hectares that a family with 2 adults can manage.

[19] The exchange rate used in the report is US$1 = R$ 4

[20] According to the Brazilian Native Vegetation Protection Law, properties that have over 400 hectares, or 4 Fiscal Modules, will likely have to reforest in some cases up to 80% of their property.

[21] These supply chains are focusing on sustainable milk and meat production.

- As forest restoration occurs, creating a pipeline of receivables, these could be securitized and pledged into a new fund structure, a Receivables Rights' Investment Fund that would appeal to a new class of investors that have lower appetite for risks.
- In addition to these direct expansion efforts, the Fund intends to create a user-friendly "Agroforestry System Assessment and Investment Template" for smallholders, lenders, and the investment community. This template will provide users with a framework to access the optimal combination of agroforestry products in a given area,[22] and a step-by-step process that will enable smallholders to expand their project to access long-term lines of credit with financial institutions (such as PRONAF).[23]

5. IMPACT

This instrument will create a blueprint forest restoration business model in rural settlements that will sequester at least 10 times more CO_2 per hectare in deforested lands over the next 20 years, deliver Brazil's Native Vegetation Protection Law Compliance to smallholders, and increase their income by more than 50%.

5.1 QUANTITATIVE MODELLING

The Lab's financial modeling assesses the agroforestry system proposed for the region of Acre, which will be the area focused on initially by this instrument, for a 20-year time frame. The system consists of combining three main crops: cocoa, coffee, and acai, with two others, bananas and rubber trees and the investments in these crops will be financed by a pool of investors and donors to the Fund: grant, concessional debt and equity providers.

While most costs are concentrated in year zero and one, revenues for this model begin in year one, mainly coming from banana production, with coffee and cocoa production starting in year three. Acai berry trees will begin production in year four. By year seven, bananas will be phased out and the three main crops will be fully productive. Rubber trees, which provide a very marginal return, will be fully productive by year 10.

The equity portion of this Fund is assumed at 17% per year for the 20-year period and will finance 30% of the capital needs to implement 500 agroforestry projects using an average of 4 hectares per project. Dividends will be paid back at the end of the period.

The additional capital needed comes from concessional debt providers that will be financing the instrument for up to 15 years and will cover 60% of the instrument's financial needs, with interest rates ranging from 7.5% to 10%. Finally, approximately 10% would come from grants to set up the New Company, put in place a 10-project pilot, and finance a portion of needed technical assistance.

Moreover, the Lab performed a sensitivity analysis to determine the variations in returns to equity investors, caused by variations in product prices and estimated productions. Variations in a basket of price and volumes in the three main products of up to 20% could affect the equity IRR up to 5%.

However, since revenues are based on a composition of three main prices and production is dispersed through a range of different properties, managed by different smallholders, it is likely that if such variations occur, they will not occur in the same direction across properties and products.

[22] The proponent will develop such a template once kicking off the first 10 agroforestry projects.
[23] National Program for "Family Based" Agriculture

5.2 ENVIRONMENTAL AND SOCIAL IMPACT

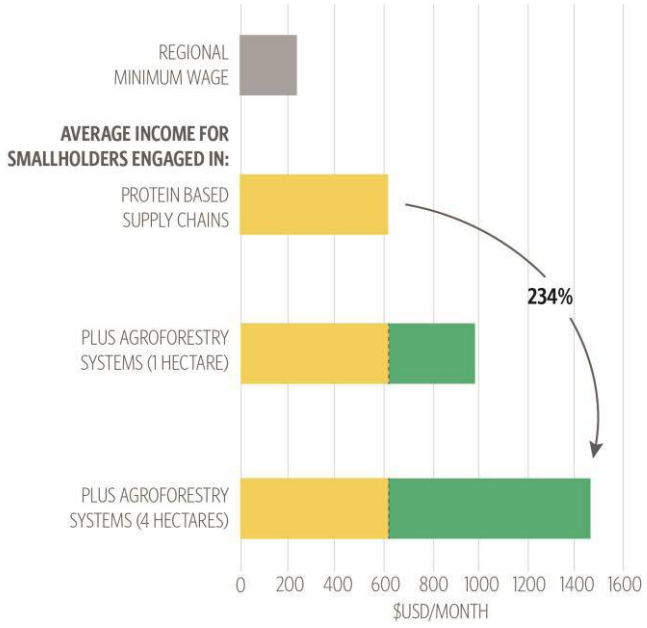
The implementation of agroforestry systems for forest restoration has important climate mitigation impacts, as it sequesters carbon over time within the trees' organic matter. Current degraded lands in the Amazon hold very little carbon, with an average ranging from 9.7 and 22.2 tons of CO_2 on a per hectare basis.[24] According to the proponent's analysis, with the agroforestry system proposed, in twenty years, the carbon sequestration potential of these agroforestry systems is approximately 220 tons of CO_2 on a per hectare basis,[25] increasing total carbon stored tenfold.[26]

Moreover, the combination of different crops improves crop resiliency,[27] preventing crop disease, and improving resilience to extreme weather events, while improving biodiversity in the ecosystem. Moreover, the spatial allocation of the agroforestry systems will also consider connectivity criteria to help support the implementation of ecological corridors.

As crops become more resilient to a changing climate, investments in agroforestry systems will generate significant social impacts.

If smallholders and their families implement agroforestry systems in only one hectare of their lands through this instrument to grow cocoa, acai berries, and coffee, in addition to the "support cultures" of rubber trees and bananas, their income could increase by 58%. If implemented in the model's proposed size of four hectares per property, their income would increase by 234%. Such returns reflect the smallholder production share conditions set forth in the Agreement with the New Company, which will be, on average 25% of total production.[28]

Figure 2: Increase in smallholder farmers' income



[24] http://www.scielo.br/scielo.php?pid=S0044-59672015000300271&script=sci_abstract&tlng=pt
[25] Osvaldo Stella, PhD, Socio Climate Benefits Fund Working Group member methodology, upon request
[26] Estimativa de Biomassa de Sistemas Agroflorestais das várzeas do Rio Juba, Cametá, Pará. – SANTOS, Silvio Roberto; MIRANDA, Izildinha; TOURINHO, Manuel Malheiros. ACTA Amazônica.
[27] https://academic.oup.com/bioscience/article/61/3/183/238071
[28] http://www.planalto.gov.br/ccivil_03/decreto/antigos/d59566.htm

5.3 PRIVATE FINANCE MOBILIZATION AND REPLICATION POTENTIAL

The proponent proposes to raise US$ 18 million, initially, to implement agroforestry systems in 500 landholdings, and, in a five-year time frame, could raise an additional US$ 15 million targeting just the smallholders that already have a commercial relationship with the companies owned by the private equity fund that is managed by the proponent.

The proponent aims to replicate this instrument beyond Acre, in the states of Mato Grosso, Rondônia, and Pará, through partnerships that are under negotiation. These regions also have good market access for cocoa, coffee, and acai and some wood sourcing species. Since the end goal is to scale up agroforestry implementation and scale up commercially such products supply chains, another cluster in either one of those states would require an additional US$ 30 million. Such funds could come either in a third capital call for the existing instrument, or a replication fund targeting new regions. Scale-up in these regions would enable engagement with up to 5000 families/smallholdings in addition to those already engaged in Acre. An additional US$ 150 million could be raised to expand activities in these regions over time.

Once smallholders are actively managing agroforestry systems, these farmers could access the PRONAF Forests government subsidized credit line for forest-based agriculture, that has a 12-year repayment schedule and interest rates of 2.5% p.a., further improving livelihoods, and capacity to invest in additional agroforestry projects.

6. KEY TAKEAWAYS

The Lab's analysis of the Socio-Climate Benefits Fund Facility found that it fulfills the following Lab criteria:

- **Innovation:** The Socio Climate Benefits Fund adapts a well-known business model used in the poultry and swine meat production sectors to implement and transfer knowledge for agroforestry systems, incentivizing forest restoration in smallholders' lands and ensuring compliance with Brazil's Native Vegetation Protection Law.
- **Financially sustainable:** The instrument initially relies on concessional capital. Once the instrument builds a track record from an initial pilot and scale-up, a new class of investors with fixed lower returns can be brought into the model, replacing concessional capital providers, in potentially a receivables fund structure.
- **Catalytic:** While the instrument pilot has a relatively small impact on 500 farms initially, its innovative nature makes it attractive for replication. There are 3,589 rural settlements in the Amazon in which smallholders are already engaged in meat and poultry raising through a franchise system that could be targets for this instrument in the future.[29] In addition, the instrument could spur greater use of other existing credit lines for agroforestry systems targeting smallholders, such as PRONAF,[30] with annually available US$ 7-10 billion at subsidized rates, but largely unused for this activity due to the barriers this instrument addresses.[31]
- **Actionable:** The proponent has more than eight years of experience developing sustainable protein-based supply chains in rural settlements, with a strong mandate from investors to deliver social and environmental outcomes from those investments. The proponent has the expertise in managing funds and companies, connections with

[29] http://ipam.org.br/wp-content/uploads/2016/02/Desmatamento-nos-Assentamentos-da-Amaz%C3%B4nia.pdf
[30] Current PRONAF resources for year 2018/2019 are at US$ 7.75 billion at an exchange rate used herein of US $1 = R$ 4
[31] https://www.socioambiental.org/banco_imagens/pdfs/Financiamento_Agroambiental_no_Brasil_ISA_2012_resumo.pdf

local services providers, a well-established smallholders' network, and a successful track record in implementing business models that deliver social incentives and environmental benefits, enabling them to implement this new business model by the end of 2019.

7. REFERENCES

Ane Alencar, Cassio Pereira, Isabel Castro, Alcilene Cardoso, Lucimar Souza, Rosana Costa, Antônio José Bentes, Osvaldo Stella, Andrea Azevedo, Jarlene Gomes, Renata Novaes. Desmatamento nos Assentamentos da Amazônia. 2016. IPAM. At: http://ipam.org.br/wp-content/uploads/2016/02/Desmatamento-nos-Assentamentos-da-Amaz%C3%B4nia.pdf

Acre State Government list of Rural Settlements: http://www.agencia.ac.gov.br/wp-content/uploads/2011/10/downloads_zee_projetos_de_assentamentos_verso.pdf

Amazon Bonn: Discussing the Challenges and the Opportunities to Achieve the Amazon Sustainable Development. November 2017. At: http://ipam.org.br/wp-content/uploads/2018/04/relato%CC%81rio-eng-v1-rec.pdf

Assentamentos Agrários Ampliaram o Desmatamento na Floresta Amazônica. August 2016. O GLOBO. At: https://oglobo.globo.com/sociedade/sustentabilidade/assentamentos-agrarios-ampliaram-desmatamento-da-floresta-amazonica-17124202

"BNDES anuncia novas condições de financiamento para restauração ecológica e economia florestal" At: https://www.bndes.gov.br/wps/portal/site/home/imprensa/noticias/conteudo/bndes-anuncia-novas-condicoes-de-financiamento-para-restauracao-ecologica-e-economia-florestal/

Brenda B. Lin. Resiliency in Agriculture through Crop Diversification: Adaptive Management for Environmental Change. BioScience, Volume 61, Issue 3, 1 March 2011, Pages 183–193 https://academic.oup.com/bioscience/article/61/3/183/238071

Donna Lee, Till Pistorius. The impacts of International Redd Finance. September 2017. At: https://unfccc.int/files/cooperation_and_support/financial_mechanism/standing_committee/application/pdf/impact_of_international_redd+_finance_-_ppt_for_scf_in_durban_(lee_and_pistorius).pdf

Estratégias para reorientar o Programa Nacional de Fortalecimento da Agricultura Familiar (Pronaf) para atividades produtivas de baixo impacto ambiental na Amazônia Legal. IPAM Amazônia. Março de 2017.

FAO Agroforestry. At: http://www.fao.org/forestry/agroforestry/80338/en/

Federici, Sandro et al. October 2017. Forest Mitigation: A Permanent Contribution to the Paris Agreement? At: http://www.climateandlandusealliance.org/wp-content/uploads/2017/10/Forest_Mitigation_A_Permanent_Contribution_to_Paris_Agreement.pdf

Forests and the Land Use in the Paris Agreement. December 2015. Climate Focus Brief. At: https://climatefocus.com/sites/default/files/20151223%20Land%20Use%20and%20the%20Paris%20Agreement%20FIN.pdf

How Improved Land Use Can Contribute to the 1.5 Celsius Goal of the Paris Agreement. Climate Focus. October 2017. At: https://climatefocus.com/sites/default/files/CIFF%20Report.pdf

Instituto Socioambiental, Lea Vaz Cardoso. Financiamento Agroambiental no Brasil; Subsídios para a Política de Apoio à Regularização Ambiental de Propriedades Rurais. At: https://www.socioambiental.org/banco_imagens/pdfs/Financiamento_Agroambiental_no_Brasil_ISA_2012_resumo.pdf

Juliano Assunção, Romero Rocha. Rural Settlements and Small Scale Deforestation: New Evidence Confirms that Rural Settlements Drive 30% of Deforestation in the Amazon Biome. INPUT. Climate Policy Initiative. At: https://climatepolicyinitiative.org/wp-content/uploads/2017/02/Rural_Settlements_and_Small_Scale_Deforestation_Brief_EN_FINAL.pdf

Juliano Assunção, Clarissa Gandour, Pedro Pessoa, Romero Rocha. Property-level assessment of change in forest clearing patterns: The need for tailoring policy in the Amazon. Land Use Policy, Volume 66, July 2017, Pages 18-27. At: https://www.sciencedirect.com/science/article/pii/S0264837716300060

Kaeté Investimentos. http://www.kaeteinvestimentos.com.br/?lang=en

Michelle Kalamandeen, Emanuel Gloor, Edward Mitchard, Duncan Quincey, Guy Ziv, Dominick Spracklen, Benedict Spracklen, Marcos Adami, Luis E. O. C. Aragão, David Galbraith. Pervasive Rise of Small Scale Deforestation in the Amazonia. Scientific Reports 8. Article # 1600 (2018)

Presidência da República, Casa Civil, Subchefia de Assuntos Jurídicos, Decreto número 59.566, de 14 de novembro de 1966. Regulamenta Seções da Lei #4.947 de 30 de novembro de 1964, Estatuto da Terra. At: http://www.planalto.gov.br/ccivil_03/decreto/antigos/d59566.htm

Programa de Inclusão Social e Desenvolvimento Econômico Sustentável do Estado do Acre – PROACRE / Financiamento Adicional PROSER. Avaliação Ambiental – AA: Financiamento Adicional Atualização da AA Original. Estado do Acre, Secretaria de Estado de Planejamento. World Bank. June 2012. At: http://documents.worldbank.org/curated/en/562821468225294666/pdf/SR460P1305930b0ent0Project00010Vol.pdf

PRONAF – Programa Nacional de Fortalecimento da Agricultura Familiar https://www.bndes.gov.br/wps/portal/site/home/financiamento/produto/pronaf

Philip Fearnside. April 2017. Analysis - Business as Usual: A Resurgence of Deforestation in the Brazilian Amazon. YaleEnvironment360. At: https://e360.yale.edu/features/business-as-usual-a-resurgence-of-deforestation-in-the-brazilian-amazon

Rodrigo de Jesus Silva. Recovery of Degraded Areas Through Agroforestry Systems. Limits and Possibilities. October 2015. At: https://www.researchgate.net/publication/294736377_RECUPERACAO_DE_AREAS_DEGRADADAS_POR_MEIO_DE_SISTEMAS_AGROFLORESTAIS_LIMITES_E_POSSIBILIDADES_RECOVERY_OF_DEGRADED_AREAS_THROUGH_AGROFORESTRY_SYSTEMS_LIMITS_AND_POSSIBILITIES

Sistemas Agroflorestais na Recuperação de Áreas Degradadas. 2014. Embrapa. At: https://ainfo.cnptia.embrapa.br/digital/bitstream/item/110058/1/sistemas-agroflorestais.pdf

SAF Cacau. Uma Ótima Opção para Agricultura Familiar, CEPLAC. At: file:///C:/Users/Tatiana%20Alves/AppData/Local/Microsoft/Windows/INetCache/Content.Outlook/CI0LK240/Sistemas%20Agroflorestais%20com%20cacau.pdf

Santos, Silvio Roberto; Miranda, Izildinha; Tourinho, Manuel Malheiros. Estimativa de Biomassa de Sistemas Agroflorestais das várzeas do Rio Juba, Cametá, Pará. ACTA Amazônica.

Moraes, L. F. D. de, Resende A. S. de, Amâncio, C. O. da G. Sistemas agroflorestais para o uso sustentável do solo: considerações agroecológicas e socioeconômicas. 2011. At: https://ainfo.cnptia.embrapa.br/digital/bitstream/item/86793/1/DOC281-11.pdf

Soluções Tecnológicas – Sistemas Agroflorestais (SAFs). Embrapa. At: https://www.embrapa.br/busca-de-solucoes-tecnologicas/-/produto-servico/112/sistemas-agroflorestais-safs

Sustainable Settlements Projects. IPAM. At: http://ipam.org.br/wp-content/uploads/2018/04/Teaser-PAS_ENG-1.pdf

Terra Capital Fund, IFC Project. At: https://disclosures.ifc.org/#/projectDetail/SPI/7338

The Moringa Fund. At: https://www.moringapartnership.com/

Zelarayan, Marcelo L. C. et al. O Impacto da Degradação sobre o Estoque Total de Carbono de Florestas Ripárias na Amazônia Oriental. Acta. Amazônica. 2015. At: http://www.scielo.br/scielo.php?pid=S0044-59672015000300271&script=sci_abstract&tlng=pt

8. ANNEX - CRITERIA FOR PRIORITIZING SMALLHOLDERS TO RECEIVE AGROFORESTRY INVESTMENTS ON THEIR LANDS

1. **Personal Form filled, original and copy of ID related documents**: The smallholder, and his/her family members above 18 years old, living within the property/land that will be used to enter into a Rural Partnership Agreement with the New Company must fill a personal form with their main information and present their ID related documents: RG, CPF, and proof of address (electricity, phone or other bill sent to that property);
2. **Proof of Income coming from the rural property:** The smallholder and his/her family members living within the property should present documents (bank account balance, tax statements, or other equivalent documents that indicate some stable income) for the last 12-months attesting that his/her primary income comes from an economic activity in his/her property and, as such he has a commercial relationship as supplier of either "Peixes da Amazônia", "Acreaves" or "Dom Porquito", in the state of Acre - the companies in which Kaeté Investimentos has an equity participation in;
    a. In case the smallholder does not have a commercial relation with the companies above, he/she needs to prove that he/she has a stable income (providing the above mentioned documents) that is associated with an economic activity within his/her property and, that he/she he lives in, for instance be engaged in a supply chain such as "milk production", "livestock production", or "agricultural production" with regular buyers
3. **Property/Land related documents:** The smallholder should present either the official permanent land title ("Escritura") or, in case he/she does not have it, he should present any other official document that attest his/her right to use the land that will be used to enter into a Rural Partnership Agreement with the New Company). Moreover, in case he/she does not have yet permanent land titles, they should prove beforehand that they are actively working towards obtaining permanent land title for the property. Therefore, any proof that he is taking the necessary steps through government sponsored programs to regularize land ownership (for instance Terra Legal or others) should also be presented
4. **Property/Land Conditions/Area**: The property that will be used to enter in a Rural Partnership Agreement with the New Company must present the related documents that attest that its part of Brazil's Land Regularization Agency's Rural Settlements (INCRA) and must not be within Indigenous Lands or Protected Areas. Moreover, the minimum required area per property to be used in the Rural Partnership Agreement should be of 2 hectares
5. **Commitment to Environmental Compliance**: The smallholder must present the registration of that property/land in the Rural Environmental Registry (CAR - Cadastro Ambiental Rural) and subsequently will sign a binding document with the New Company in which it commits to meet Brazil's Forest Code requirements in up to 5 years