SYSTEMIQ

BRAZIL'S NEW GREEN ECONOMY:
HOW CARBON SHOULD TAKE A BACKSEAT IN THE NATURE-BASED SOLUTIONS RACE

Consultation report | September 2023

AUTHORS AND ACKNOWLEDGEMENTS

This publication was developed by Systemiq Latam and has been written as a consultation report. We would like to thank all specialists, institutions, and organizations for providing input into this consultation report, the socio-economic and environmental information specific to Nature-based Solutions in Brazil and the identification of case examples. Several individuals and institutions have generously contributed their time and energy to this effort.

This report serves to engage stakeholders across sectors supporting the growth of Nature-based Solutions in Brazil and lays out the main challenges and an initial set of actions to accelerate the transition. This consultation report was authored by José Polli, Marco Brito, Fernando Chan, Caroline Américo, Fernanda Sue, Felipe Faria and Patricia Ellen. We would like to thank the following individuals for their input and expertise: Morten Rosse, Moritz de Chaisemartin, Nathan Renneboog, Teresa Labonia, and Pedro Ferro.

ABOUT SYSTEMIQ

Systemiq was set up in 2016 to drive and accelerate the implementation of the Paris Agreement and the UN Sustainable Development Goals (SDGs) by transforming markets and business models in five key economic systems: (1) energy and infrastructure, (2) food and land use, (3) resources and material solutions, (4) sustainable finance, and (5) cities. It does this by advising industry leaders, influencing policy through research and deep stakeholder engagement, incubating disruptive business opportunities, and mobilizing large scale capital across these systems to drive transformational change.

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1. INTRODUCTION

Nature-based Solutions (NbS) have become an important concept for accelerating the low carbon transformation and economic growth in the Global South. It provides a strong business case for restoring degraded land and conserving land at risk of deforestation. However, the pursuit of NbS should not be confined to its carbon credit generation potential but encompass a broader perspective, considering their potential to yield financial benefits from its primary activities, promote diversification, create new jobs, endorse climate-smart practices, and enhance biodiversity.

Amidst the challenges posed by the climate crisis and the need to foster sustainability in our productive systems, carbon credits often seize the spotlight as the primary catalyst for change and source of value creation. We estimate that the proportion of net sales generated by carbon credits ranges from 1% to 14%, serving as a supplementary revenue stream rather than its primary one. Furthermore, primary activities are the ones responsible for driving NbS' long-term socio-economic and environmental value and what truly supports its business case

This consulting paper aims to demonstrate the intrinsic value generated by NbS and highlight how carbon credits, while playing a pivotal role in bolstering economic viability of projects, do not guarantee financial success. The study delves into four key NbS based on market potential in Brazil: (i) Non-timber forest products, (ii) Timber Forest products, (iii) Agroforestry Systems and (iv) Integrated Livestock Systems (ILFS/ICLFS/ICL). Together, these sectors have the capacity to transform 83 million hectares and to generate $103 to $397 billion USD in value add for Brazil and create up to 805 thousand jobs by 2050, with an investment range of $4.1 to $4.4billion USD per year. These solutions are expected to generate 96 to 202 million metric tons of CO2 equivalent per year (MtCO2e) of carbon credits by 2050 which, in theory, represent 16% to 34% of emissions generated by the Agribusiness sector in Brazil in a year (1).

The findings underscore the importance of stakeholder collaboration in accelerating the transition and developing the NbS sector. Key actors can play a critical role in helping the sector overcome challenges related to access to credits, technical expertise, scaling technologies, and access to markets. This consulting paper expounds on the specific actions that Government, Investors, Producers, and Off-Takers can employ to bolster the development of NbS sector in response to these challenges.

Access to credits

- **Government** can allocate a greater share of funds destined to the development of the agriculture sector towards the transition of traditional systems to scaling of sustainable solutions.
- **Investors** can leverage financial mechanisms (e.g., blended finance) to de-risk investments and improve access to credits.
- **Off-Takers** can guarantee long-term purchase agreements that can be coupled with finance programs that foster the structuring and development of value chains to attract further investments.

Access to technical assistance

- **Government** can expand existing technical assistance programs – especially in locations that currently have no access to technical assistance or training
- **Investors** can operate as incubators and build enabling conditions for the upskilling of producers and create incentives for best practices.
- **Producers** can share best practices to help scale successful business models in the sector.
- **Off-Takers** can strengthen key stakeholders such as cooperatives or smallholders by co-investing in technical assistance programs or facilitating access to ag inputs or other essential services.

Scaling technologies

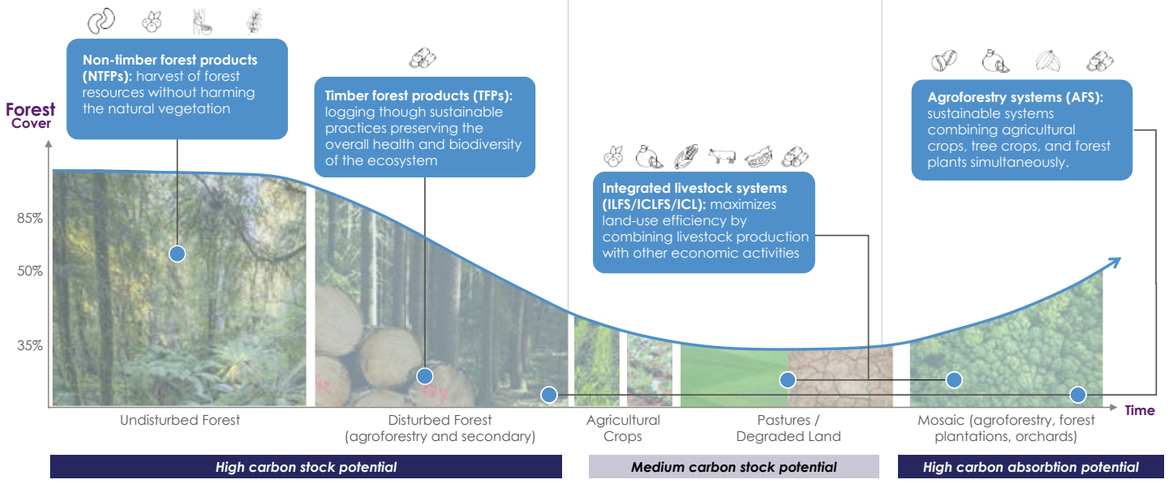
- **Government** can increase public funding for research institutes and universities to advance scientific discoveries and improve access to the latest technology.
- **Investors** can channel investments towards sustainable technology R&D to unlock bioeconomy potential and safeguard biodiversity.
- **Off-takers** can accelerate the rate of innovation and implementation of technology by engaging with the supply chain and creating technology adoption incentives.

Access to markets

- Government can invest in infrastructure improvements to facilitate commodity flow domestically and internationally.
- Off-Takers can build the NbS products' value proposition, and ensure they command premium positions in the market.

2. BRAZIL: A THRIVING NATURE-BASED SOLUTIONS HUB

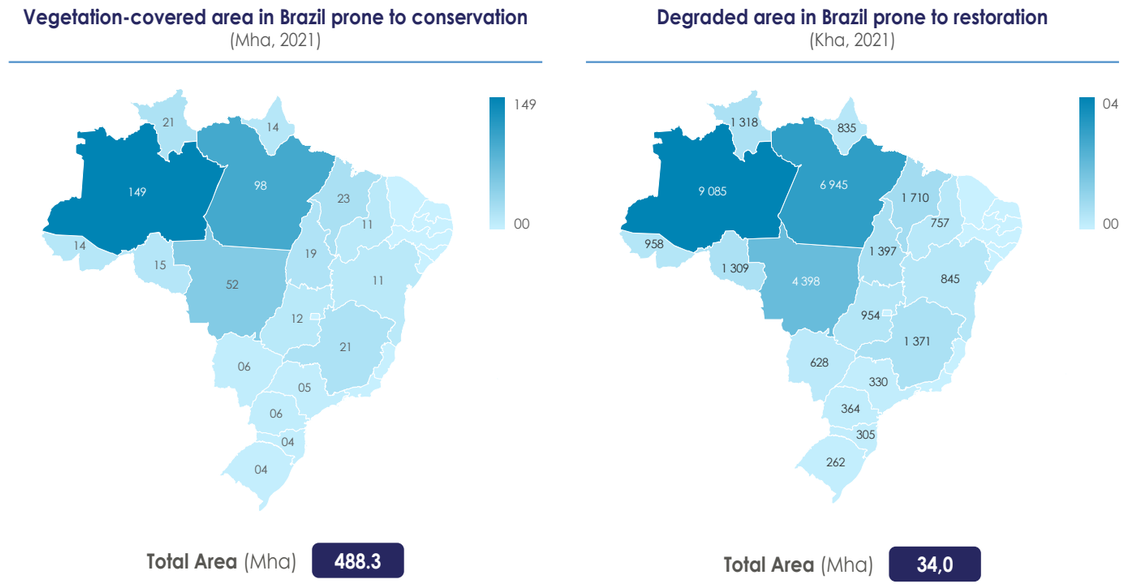
NbS´ economic activities in land use systems are typically spread across the forest transition curve which can be divided into three archetypes: (A) Creating Value from Standing Forests, (B) Agricultural Production Models (Produce and protect) and (C) Creating Value from Reforestation (See Figure 1). The curve characterizes the transition of anthropic processes, which starts with total native vegetation coverage, transits through agricultural production, and ends with land restoration. Nature-based solutions associated with land use create productive economic models that preserve and restore land while generating fewer GHG emissions than traditional production systems or even acting as a carbon sink. This consulting paper prioritized five main NbS based on their potential for intervention area and financial returns within the Brazilian context (See Annex for definitions).



Sources: Prosperous Forest, 2021, FOLU

Figure 1 *– Forest Transition Curve - Three NbS archetypes and the four prioritized NbS*

Brazil has enormous potential in land conservation and restoration across its three largest biomes (i.e., Amazon, Cerrado and Mata Atlântica) (See Figure 2). This potential is illustrated by the 488 million hectares of native vegetation coverage suitable for NTFP and TFP, and 34 million hectares of land suitable for restoration expansion with AFS, ILFS and ICLFS (2) (3).



Sources: Systemiq Analysis; MapBiomas; EMBRAPA; TNC

Figure 2 *– Total areas available for conservation and restoration in Brazil for the Amazon, Cerrado and Mata Atlântica biomes (Million hectares, 2021)*

The potential for both conservation and restoring activities is well-documented as Brazil can generate $2.3 billion USD a year with forest-compatible products if it captures an additional 1% of the global market share. The gap is even more alarming considering that 33% of the world´s tropical forests are in Brazil, but the country represents 0.2% of the market for forest products (4). In addition, there are opportunities for expanding nature-based models for other commodities such as cattle, maize, and soy, and produce better economic, social, and environmental outcomes. For example, integrated livestock systems can yield up to 4 times more than traditional livestock systems (5).

3. HOW DO NATURE-BASED SOLUTIONS DRIVE LONG-TERM VALUE?

The case for nature-based solutions has expanded to more than just a novel concept as it´s become the most cost-effective way for governments and companies to provide social, environmental, and economic benefits to society and to the world excluding curbing deforestation rates. It has been proven to stimulate job creation, contribute to climate change mitigation and deliver financial returns equivalent to traditional food production systems.

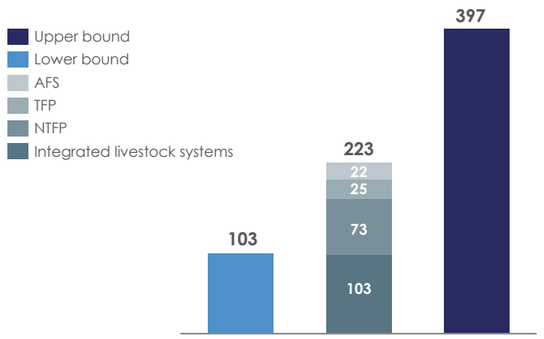
3.1. THE ECONOMIC CASE

The four prioritized NbS can generate $103 to $397 billion USD in value by 2050 from an investment in the range of $4.1 to $4.4 billion USD per year, which can represent at least one-third of the current agricultural GDP of Brazil (See Figure 3). However, achieving its full potential hinges on a variety of converging factors and enabling conditions such as access to public and private financing, technical expertise, scaling technologies, and access to markets to ensure effective implementation. Given Brazil´s $1.8 billion USD annual investment budget for sustainable agriculture (6) (7), we estimate that Brazil can capture from 41% to 45% of the full potential by 2030, which represents $42 to $180 billion USD per year in value by 2050. Investments would need to increase by at least 2.2 times to reach its full potential of conservation and restoration through these prioritized NbS, which would represent 5% of the $73 billion USD per year in financing available through the Safra Plan. (See Figure 4).

Figure 3 – *Full value-add potential of Nature-based solutions in Brazil[1] (Billion USD, 2030-50)*

Figure 4 – *Feasible potential for Nature-based solutions in Brazil, (Billion USD, 2030-50)*

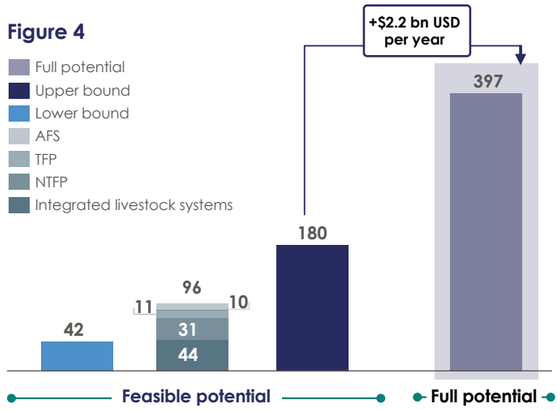
Figure 3



Notes: (1) The above presented full potential is estimated by considering economic and environmental criteria such as the availability of degraded agricultural areas, their suitability for transitioning from a business-as-usual approach to a regenerative productive system, and the anticipated growth in market demand for a specific commodity.

Source: Systemiq Analysis; IPAM; TNC; MapBiomas; Rede ILPF; Embrapa. UFMG

Figure 4

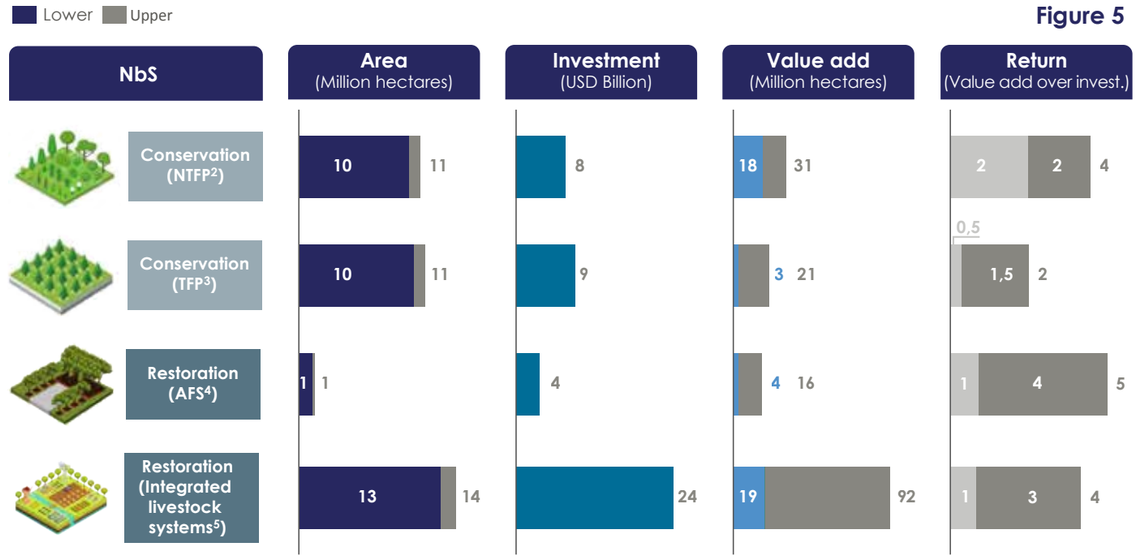


Notes: (1) By evaluating this combined pool of public and private financing that could be channeled into Natural-based Solutions and measuring it against the annual investment required to unlock the full Natural-based Solutions potential outlined earlier

Source: Systemiq Analysis; Brazilian Federal Government; ANBIMA;

When assessing the value potential at the NbS level, average return multiples range from 2 to 4 by 2050 (See Figure 5). Estimates were drawn from operating NbS in Brazil and highlight the financial upside for each activity.

Figure 5



Notes: (1) Based on the combined pool of public and private financing that could be channeled into NbS and measuring it against the annual investment required to unlock the full NbS potential; (2) Considers an average investment of USD 1,250 per hectare and a return of USD 3,000 per hectare; (3) Considers an average investment of USD 800 per hectare and a return of USD 1,000 per hectare; (4) Considers an average investment of USD 2,800 per hectare and a return of USD 7,400 per hectare; (5) Includes integrated crop-livestock-forestry, crop-livestock, and livestock-forestry systems, and considers an average investment of USD 1,850 per hectare and a return of USD 3,300 per hectare;

Source: Systemiq Analysis; IPAM; TNC; MapBiomas; Rede ILPF; Embrapa. UFMG; Brazilian Federal Government; ANBIMA;

Figure 5 *Feasible potential by NbS in Brazil[1] (2050)*

Non-Timber Forest Products (NTFP) have a high potential for value-add associated with superfoods (e.g., cocoa, açaí, Brazil nuts) at a relatively low required capital expenditure. In addition, current production is overwhelmingly focused on primary extraction, foregoing 7 to 22 times of its value by exporting them as raw products to other neighbouring countries (8). Development of these value chains can have critical positive spillovers to local communities as a larger share of the value would be captured locally.

Timber Forest Products (TFP) yields the lowest returns given its long extraction lead time with no short-term returns. In addition, it has high incidence of illegal activity which jeopardizes the reputation of companies operating legally. Harvesting timber with sustainable practices costs approximately 30% more than traditional methods (9).

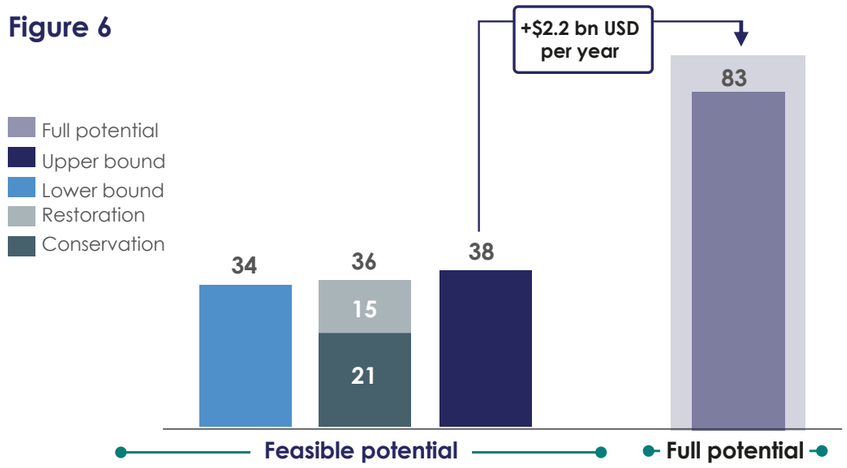
Agroforestry Systems (AFS) increases profits and portfolio diversification, but its adoption is still restricted to small properties. Studies have shown that 500 thousand hectares of deforested and degraded land have high suitability to be restored with cocoa agroforestry systems (3). It yields higher profitability compared to traditional monoculture systems (e.g., over 2 times more than soy returns), but requires higher upfront investments, roughly $2,939 USD (10) per hectare on average. Furthermore, the process can be labor-intensive, demanding more workforce and significant upskilling.

Integrated Livestock Systems (ILFS/ICLFS/ICL) (See Annex for definitions) maximizes land-use efficiency by combining livestock production with other economic activities while generating positive spillovers related to soil health, biodiversity, and carbon sequestration – all of which improves productivity. This system increases soil nutrient availability and hydrological balance, which will ultimately improve cattle´s weight gain and crop quality. There is significant potential for implementation as 50% of all pasturelands in Brazil exhibit varying degrees of degradation and low cattle productivity (8). Strong financial returns are driven by the increase in cattle productivity and new revenue streams from the sale of timber and/or crops.

3.2. THE SOCIAL AND ENVIRONMENTAL CASE

We estimate significant social and environmental upside by 2050 as it can impact an area of 34 to 38 million hectares (equivalent to 4% of the Brazilian territory) (See Figure 6), create 719,000 to 805,000 new jobs (See Figure 7), and sequester 96 to 202 million metric tons of CO2 equivalent (MtCO2e). (See Figure 8). Out of the total area, 14 to 16 million hectares would be restored whereas 20 to 22 million hectares would be preserved. If Brazil increased its current investment level of $ 1.8 bn USD per year by 2.2 times and achieved full potential, this would represent 83 million hectares in intervention area. The avoided or sequestered emissions could potentially represent 6% to 17% of Brazil's climate mitigation potential by 2050.

Figure 6

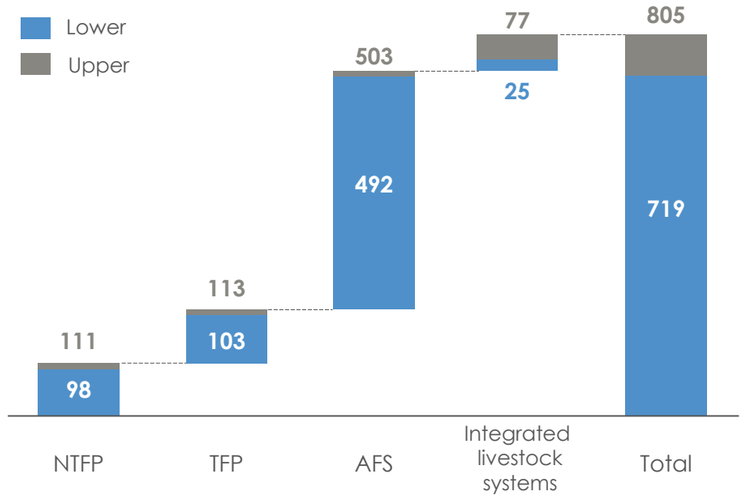


Notes: 1) Out of this total, 15 million hectares would be restored via Agroforestry systems and Integrated Livestock systems, whereas 21 million hectares would be preserved via Non-timber Forest Products and Timber Forest Products.

Source: Systemiq Analysis

Figure 6 *Intervention area for selected Nature-based Solutions (Million hectares, 2050)*

Figure 7

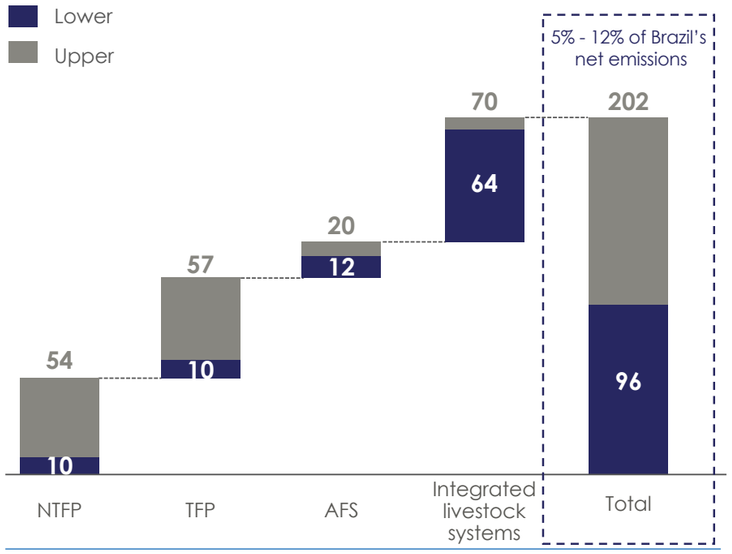


Notes: (1) Considers a job creation potential of 0.01 job per hectare for NTFP, 0.01 job per hectare for TFP, 0.4 job per hectare for AFS, 0.002 job per hectare for Integrated Livestock systems

Source: Systemiq Analysis

Figure 7: *Total new jobs created by NbS[1] (Thousand jobs, 2050)*

Figure 8



Notes: (1) Considers a carbon credits generation potential of between 1 to 5 tCO2e for NTFP, 1 to 5 tCO2e for TFP, 10 to 15 tCO2e for AFS, 5 to 10 tCO2e for Integrated Livestock systems

Source: Systemiq Analysis

Figure 8 *– Total GHG emissions avoided or removed by NbS and potential climate mitigation (MtCO2e, 2050)*

3.3. THE CARBON CREDIT CASE

While these NbS undeniably deliver significant socio-economic and environmental benefits, revenue attributed to carbon credits remains a small fraction of the total value-add (See Figure 9). This premise holds true even in a high carbon price and demand scenario where carbon revenues would be maximized.

Figure 9

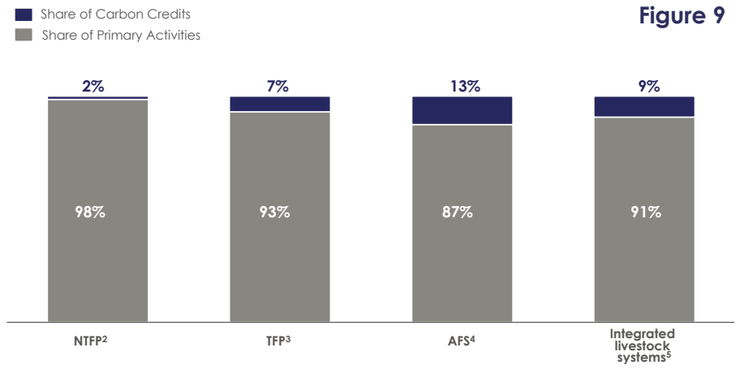


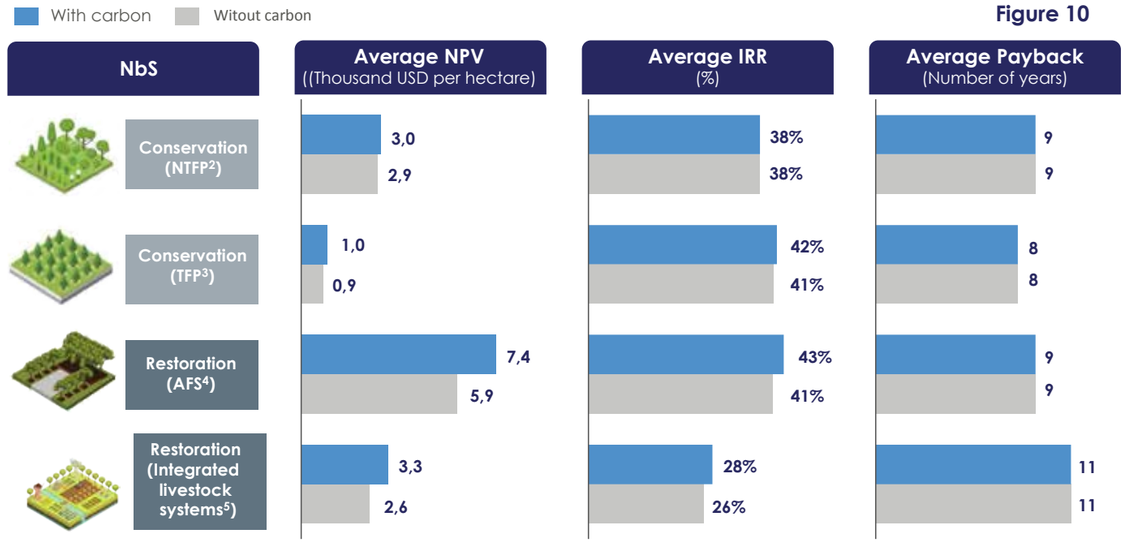
Figure 9 *– Share of carbon credits in relation to total NbS net sales1 (2050))*

Notes: (1) (1) Examines supplementary net revenue generated beyond the primary activities of NbS, once they reach maturity, stemming from the sale of carbon credits at prices aligned with Trove Research's projections for avoidance and removals credits for 2035 and 2050, and results can vary according to NbS and carbon credits price forecasts; (2) Ranges from 1% to 2%; (3) Ranges from 6% to 8%; (4) Ranges from 11%% to 14%; (5) Ranges from 8% to 10,5%;

Source: Systemiq Analysis; Trove Research

Furthermore, it's worth highlighting that NbS can achieve financial sustainability even in the absence of revenue coming from the sales of carbon credits (See Figure 10). In essence, the income generated from carbon credits doesn't significantly bolster the financial upside of NbS activities, nor is it pivotal for their long-term economic viability.

Figure 10



Notes: (1) Examines financial results generated beyond the primary activities of NbS, once they reach maturity, stemming from the sale of carbon credits at prices aligned with Trove Research's projections for credits related to emissions avoidance and removals

Source: Systemiq Analysis; Trove Research

Figure 10 *– Comparison between NbS financials with and without carbon component (2050)*

Despite its reduced financial contributions, carbon credits remain an important mechanism to neutralize emissions in hard-to-abate sectors. As most sectors will be unable to ramp-up technology fast enough to reduce emissions by 2030 and 2050, neutralization via carbon credits will be a viable, but temporary solution for companies to mitigate emissions. In addition, within value-chain carbon reduction via carbon accountability of the removals have the potential to generate premiums for low carbon products. The Science-based Targets Initiative (SBTi), which has become the gold-standard for emissions reduction targets, allows for up to 10% of residual emissions that cannot be eliminated to be neutralized by carbon credits (11).

Nature-based Solutions are a great opportunity for Brazil to unlock significant economic, social, and environmental impact. While challenges exist in terms of financing, technical know-how, and market access, and despite the limited impact of carbon credits on financial outcomes, NbS have the potential to significantly impact the Brazilian economy by generating thousands of job opportunities, mitigate GHG emissions, and accelerate the country´s transition to net-zero.

4. HOW CAN BRAZIL UNLOCK THIS OPPORTUNITY?

Brazil has the potential to become a thriving hub for Nature-based Solutions. It can create value for the local economy by increasing yields of well-established food production systems and develop well-structured forest value chains. A well-oiled NbS market can be the engine for Brazil´s new green economy, but this potential is hindered by four major barriers: (1) access to credits, (2) access to technical assistance, (3) scaling technologies and (4) access to markets:

CHALLENGE 1: ACCESS TO CREDITS

According to the last Agricultural Census conducted by IBGE (Brazilian Institute of Geography and Statistics) (12) , only 15% of the properties accessed credit. Financing terms for rural credit programs often create barriers related to environmental legislation non-compliance, land title irregularities (e.g., 32% of private Amazonian lands lack land titles (13)) and extensive implementation lead time. Financing programs are often the only channel for producers to invest in sustainability-related projects and not all intervention models are eligible such as sustainable livestock implementation, where profits are 80% higher than traditional models but upfront capex is high and payback periods are over 7 years (14). To further illustrate the challenge, approximately 72% of smallholders faced obstacles during a credit application process for a project in the Amazon (15) aimed at supporting rural families in restoring degraded pastures with cocoa agroforestry systems. Specialized companies implementing these credit projects had limited operational capacity to assist producers due to logistical challenges. These same logistical challenges led to low levels of access to technical assistance for producers (e.g., financial management of the property) and resulted in higher perceived risk by financial institutions when running credit analysis.

CHALLENGE 2: ACCESS TO TECHNICAL ASSISTANCE

The availability of technical assistance to support producers in the transition is not enough to meet the required demand for a net-zero transition. The Agricultural Census revealed that the coverage of Agricultural Technical Assistance and Rural Extension in the Amazon territory is still significantly lower compared to the rest of the country. While the national coverage rate is 20%, in the Northern region, it is only 10%, with some Amazon states such as Pará, with rates as low as 6% (16). Producers in these areas are even more dependent on government policies to access technical assistance services, as the absence of a robust business case for technical assistance services makes it unattractive for organizations to provide it at scale and thereby restricts their availability.

CHALLENGE 3: SCALING TECHNOLOGIES

The rate of NbS-specific technology development and implementation has been slow and faces barriers reaching the necessary scale for mass adoption. While there´s capital available to finance the development of NbS, there´s still limited investment allocated towards research and development and innovation – an essential component to ensure long-term economic sustainability. For instance, there are limited technological packages to scale-up agroforestry models. While the rate of innovation and technology adoption has increased in the last few years, accelerating the transition requires more disruptive intervention models which can be piloted, implemented, and scaled in the new few years.

CHALLENGE 4: ACCESS TO MARKETS

Given the low market penetration for NbS, the lack of well-developed infrastructure and supply chain ecosystem can become a detractor for wider adherence. As many producers lack the proper infrastructure to deal with the logistics challenge of scaling production of NbS products in remote Amazon regions, the majority relies on intermediaries to access markets (e.g., around 75% of the cocoa produced in the state of Pará is traded by informal intermediaries (17)). As a result, levels of informality across the value chain increase, challenging the implementation of effective traceability mechanisms and certification processes, hindering the accurate pricing of sustainable commodities, and consequently reducing its financial attractiveness.

Solving these structural challenges demands a systemic change with coordinated efforts from Governments, Investors, Farmers and Off-takers as the main stakeholders responsible for implementing and scaling NbS. We have identified specific actions in how each of these stakeholders can help address the challenges and contribute to a quicker and more efficient transition:

4.1. ACTIONS TO FACILITATE ACCESS TO CREDITS.

Government: There is roughly $73 billion USD per year in available financing from the Safra Plan (6), which can be destined exclusively or in its majority to the development of NbS or to support farmers in sustainable transitions. Most popular rural credit programs are still administered by the federal government and financing terms can be adjusted to break down barriers related to land tenure and titles.

Case example ***RenovAgro, a program within the Safra Plan, is a financing program targeting farmers investing in scaling sustainable agricultural practices. However, it amounts to only $ 1.4 billion USD, which represents 2% of the Plan's budget (6).***

Investors: Structure financial mechanisms (i.e., first loss risk participation, green bonds connected to social and environmental outcomes, blended finance instruments) or set up programs to provide credit lines with technical assistance to de-risk investments and provide a hedge against longer payback periods and higher risk exposures.

Case example ***AGRI3 Fund offers portfolio companies and producers access to finance, inputs, and offtake agreements to accelerate their transition towards more sustainable agricultural practices. It serves as a de-risking mechanism and enhances portfolio returns.***

Off-Takers: Guarantee long-term purchase agreements or equity investments that can be coupled with finance programs that foster the structuring and development of value chains to attract further investments. Companies can also provide management and expertise support as a strategic initiative to ensure sustainable sourcing within its supply chain.

Case example ***Ecoflora, a Colombian company that developed the first natural blue colorant called aguaje, purchases its raw materials from small local producers and provides incentives to preserve the aguaje trees. Ecoflora offers loans to producers to start their operations and is only due when producers achieve high production volumes (18).***

4.2. ACTIONS TO EXPAND ACCESS TO TECHNICAL ASSISTANCE.

Government: Expand the reach and availability of technical assistance programs specific to sustainable transitions and Nature-based Solutions. Several technical assistance programs are still provided by the government (e.g., PRONATEC AGRO; SENAR), but are unevenly distributed across producing regions. Furthermore, attendance is very low as studies have shown that only 8% of farmers have accessed any public technical assistance (16). Closing the skills gap will be essential for equipping producers with the right tools to succeed in the transition.

Case example ***Santa Catarina state registered one of the most successful cases of public technical assistance where 19% of all properties were covered. It included a flagship program called Epagri, a public technical assistance company with presence in 99% of municipalities (16).***

Investors: Help build and foster the right enabling conditions for the NbS sector to grow by investing and incubating producers NbS. The sector not only needs capital investments but also comprehensive programs to upskill farmers and close the skills gap.

Case example ***Partnerships for Forests, a UK government-funded program, designs, incubates and grows Nature-based Solutions. It catalyzes investments in which the private sector, public sector and communities can achieve shared value from sustainable forests and sustainable land use. The program also supports demand side measures that strengthen demand for sustainable commodities and activities to create the right enabling conditions for sustainable investment.***

Producers: Have a pre-competitive mindset and share best practices. Successful business models will provide the basis for scaling NbS across multiple regions and producer profiles. It ultimately help grow the sector and make it more attractive to investors. Cooperatives, associations, and community projects can be effective channels for scaling knowledge with a wider network of producers.

Case example ***The Nature Conservancy (TNC), in partnership with Ofi and Mondelez, has set up several demonstrative units of a well-established productive system to showcase to other producers enrolled in the Cocoa Forest program the successful outcomes of restoring degraded areas with cocoa agroforestry systems.***

Off-takers: Support the development of NbS value chains through investment in pre-competitive structural initiatives. These initiatives strengthen key stakeholders such as cooperatives or individual producers by providing them with the necessary tools and best practices to succeed (e.g., technical assistance, ag inputs, credit through cooperatives).

Case example ***CocoaAction Brazil is a pre-competitive initiative within the cocoa sector, financed by private stakeholders within the cocoa value chain, in partnership with government agencies, with the objective of structuring and developing the cocoa value chain, and enhance the sector's productivity and sustainability.***

4.3. ACTIONS TO IMPROVE THE SCALING OF TECHNOLOGY.

Government: Increase public funding for research institutes and universities to advance scientific discoveries and improve market access to the latest technology. There is already a rich treasure chest of knowledge and expertise in Brazil which is severely underfunded by the government and just needs to be unlocked.

Case example ***Embrapa, is a well-renowned state-owned Brazilian Agricultural Research institute, that studies and promotes technological solutions to advance the agricultural sector and increase its global competitiveness and sustainability.***

Investors: Channel investments towards sustainable technology R&D to unlock bioeconomy potential and safeguard biodiversity, particularly by fostering the development of innovative forest protection and restoration technologies.

Case example ***The Amazon Technological Institute (AmIT), created by Carlos Nobre, a Brazilian scientist and meteorologist, aims at creating the world's first science and technology institute for sustainable and socially inclusive bioeconomy in the Amazon. By channeling private investments of around $ 200 Million USD per year, the institute's research activities will focus on innovation and capacity building to capture more value-add in the Amazon bioeconomy (8).***

Off-takers: Accelerate the rate of innovation and implementation of technology by engaging with the supply chain and create adoption incentives. Initiatives would include investments in research and development (e.g., seedling technology), collaboration with government agencies on efforts to increase the sector's transparency (e.g., investing traceability solutions for NbS value chains) and provision of price premiums for adoption of specific practices.

Case example ***The Global Coffee Platform (GCP) is a multistakeholder membership association dedicated to advancing the coffee sector towards sustainability. GCP brings together coffee growers, traders, roasters, governments, and non-profit organizations to align efforts and channel investments towards cross-sectorial deficiencies to expand local sustainability initiatives and boost the global market for sustainable coffee worldwide.***

4.4. ACTIONS TO IMPROVE ACCESS TO MARKETS.

Government: Improve physical infrastructure to facilitate the flow of commodities domestically and ultimately to international markets. Specific agencies, such as APEX Brazil, can also help market Brazilian sustainable products in international markets and ultimately generate demand for these premium commodities.

Case example ***Funcacau, a public fund from the state of Pará, helps promote the visibility of cocoa and its sub-products in international markets by highlighting the unique origin and sustainable practices of the system.***

Off-Takers: Strengthen the NbS value proposition as a premium commodity through long-term purchasing contracts. Off-takers can reduce the risk exposure of investors by guaranteeing demand for these NbS products and at the same time, ensure producers are receiving price premiums. This will ultimately increase the value of the standing forest and help re-signify the value of nature.

Case example ***Nestlé´s Cocoa Plan guarantees price premiums to producers meeting specific sustainability criteria while offering other complementary services such as technical assistance and training.***

5. LOOKING AHEAD

Brazil has the right green assets to become the first major economy to be net-zero by 2030 and become a green growth engine. There is a crucial window of opportunity in the next few years as economies are getting rewired. Unprecedented policies are accelerating a new wave of investment and opportunity for new green technologies to breakthrough and nature to be appropriately valued. Brazil´s Ecological Transition Plan has the potential to unlock a higher rate of climate spending which could rival the United States Inflation Reduction Act and the European Union Green Deal – both are expected to allocate $ 254-290 billion USD (19) per year in climate transition spending.

The land-use NbS market is well-positioned to ride this wave as private and public sector rush to close the current decarbonization gap. To overcome the structural barriers laid out in this paper and capture this multi-billion-dollar opportunity, it requires stakeholder partnership and coordination to affect the system. A shared view of the opportunity will enable these NbS to become scalable economic activities with mass adoption at a much higher rate than other conventional micro solutions. It´s time for Brazil to take center stage, leverage its green assets and re-signify the real value of nature. The Global South has what it takes to transition traditional commodities into premium products that generate social and environmental benefits that the world needs.

6. ANNEX

FULL-DEFINITIONS OF THE 4 MAIN NATURAL-BASED SOLUTIONS

- **Non-timber forest products (NTFPs)** encompass a diverse range of forest resources such as Brazil Nuts, Açaí Berries, Rubber, Medicinal Plants, and Resins, that are harvested without harming the natural vegetation, and therefore enhancing forest protection. Harvesting and processing NTFPs are typically done by local communities, and therefore improve their livelihoods as it generates new jobs and additional income for these people.
- **Timber forest products (TFP)** are derived from sustainable logging practices such as reduced-impact logging, which involves careful planning and selective harvesting, targeting only mature trees for extraction, while preserving the overall health and biodiversity of the forest ecosystem (13).
- **Agroforestry systems (AFS)** are sustainable management systems for land that increases overall production, combines agricultural crops, tree crops, and forest plants simultaneously. There are several distinct types of AFS and associated practices, in which other trees provide shading and microclimatic protection for crops, such as cocoa trees, besides also playing productive roles (e.g., timber, fuelwood, and fruits), and maintaining soil fertility, storing carbon, and hosting pollinators and other types of wildlife.
- **Integrated Livestock Systems** include three different types of systems:
  - **Integrated Crop-Livestock-Forestry Systems (ICLFS)** are multifunctional land-use systems that bring together livestock rearing with annual or perennial crops, such as maize, soybeans, of fruit trees, and tree components that can serve either to provide shading for livestock and produce timber or non-timber forest products.
  - **Integrated Livestock-Forestry Systems (ILFS)** involve the combination of pastures with tree crops, such as forest species, fruit trees, multipurpose leguminous trees, or industrial plantations.
  - **Integrated Crop-Livestock Systems (ICL)** involve the combination of pastures with annual or perennial crops, such as maize, soybeans.

METHODOLOGY: POTENTIAL AND FEASIBILITY CALCULATIONS FOR SELECTED NBS

- **Non-timber forest products (NTFPs):** Full potential area encompasses 10% of the current forest cover in the Amazon biome, resulting in approximately 30 million hectares of potential NTFP activities.
- **Timber forest products (TFPs):** Considers the future demand for native timber and the available area of public forest under concession for reduced impact logging, as indicated by a study conducted by the Amazon Environmental Research Institute (IPAM). It´s estimated that there is an additional need for 25 million hectares of forest under sustainable management in Brazilian native forests.

- **Agroforestry systems (AFS)**: Based on a study by The Nature Conservancy (TNC), which predicted that cocoa agroforestry systems could potentially restore up to 557 thousand hectares of degraded pastures in the state of Pará. The same restoration potential was extrapolated to other states in the Legal Amazon (using their degraded pasture areas as proxy), which yielded a total potential area of 3 million hectares.
- **Integrated Livestock Systems (ILFS/ICLFS/ICL):** Considers the expected increase of 31 million hectares in Integrated Livestock Systems' total area estimated by the ICLFS network (Rede ILPF) (20). Subsequently, the total area was allocated between ICLFS, ILFS and ICL systems based on their current and projected shares in relation to the total area of Integrated Livestock System, according to data from "Emorata Agrossilvipastoril", resulting in a full potential area of 3 million, 2 million hectares, and 26 million hectares respectively (21).

The feasibility calculations were determined by discounting the full potential area by 46%, considering the proportion of available public and private investments in relation to the total capital required for full implementation ($1.8 billion USD vs. $3.9 billion USD).

7. REFERENCES

1. Sistema de Estimativas de Emissões e Remoções de Gases de Efeito Estufa. Brazilian Emissions per Economic Activity in 2021. Available at: https://plataforma.seeg.eco.br/total_emission.

2. Amazônia 2030. Oportunidades para Exportação de Produtos Compatíveis com a Floresta na Amazônia Brasileira. Available at: https://amazonia2030.org.br/wp-content/uploads/2021/04/AMZ2030-Oportunidades-para-Exportacao-de-Produtos-Compativeis-com-a-Floresta-na-Amazonia-Brasileira-1-2.pdf.

3. CNA. ESTUDO DE VIABILIDADE ECONÔMICA NA IMPLANTAÇÃO DOS SISTEMAS INTEGRAÇÃO LAVOURA-PECUÁRIA, SILVOPASTORIL E INTENSIFICAÇÃO DE PASTAGEM EM PROPRIEDADES DE PECUÁRIA DE CORTE. Available at: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://abccapacitacao.files.wordpress.com/2012/11/pecuaria_corte_estudo-de-viabilidade-economica-abc_31out2012.pdf.

4. Ministério da Agricultura e Pecuária. Presidente anuncia Plano Safra 2023/2024 com financiamento de R$ 364,22 bilhões. Available at: https://www.gov.br/agricultura/pt-br/assuntos/noticias/presidente-anuncia-plano-safra-2023-2024.

5. Aya Earth Partners, Attali Associates. Unlocking Brazil's Green Potential.

6. The Amazon's Marathon: Brazil to lead a lowcarbon economy from the Amazon to the world. Available at: https://www.systemiq.earth/amazons-marathon/.

7. Imazon. Custos e Benefícios do Manejo Florestal para a Produção de Madeira na Amazônia Oriental. Available at: https://imazon.org.br/custos-e-beneficios-do-manejo-florestal-para-a-producao-de-madeira-na-amazonia-oriental-n-10/.

8. The Nature Conservancy (TNC). Available through: https://ciclovivo.com.br/planeta/meio-ambiente/cacau-agroflorestal-para/.

9. WWF Brasil, Embrapa, Universidade Federal do Acre, Embrapa, Secretaria Estadual de Meio Ambiente. Available through: https://globorural.globo.com/Noticias/Sustentabilidade/noticia/2020/09/agroflorestas-geram-mais-lucro-que-soja-e-gado-na-amazonia.html.

10. Science Based Targets Initiative. THE CORPORATE NET-ZERO STANDARD. Available at: https://sciencebasedtargets.org/net-zero.

11. Escola Superior de Agricultura Luiz de Queiroz - Universidade de São Paulo. Sustainable forest management. Available at: https://edisciplinas.usp.br/pluginfile.php/5649255/mod_folder/content/0/4.%20Sustainable%20forest%20management%20%28SFM%29%20of%20tropical%20moist%20forests%20the%20case%20of%20the%20Brazilian%20Amazon.pdf?forcedownload=1.

12. IMAGINE - The Food Collective.

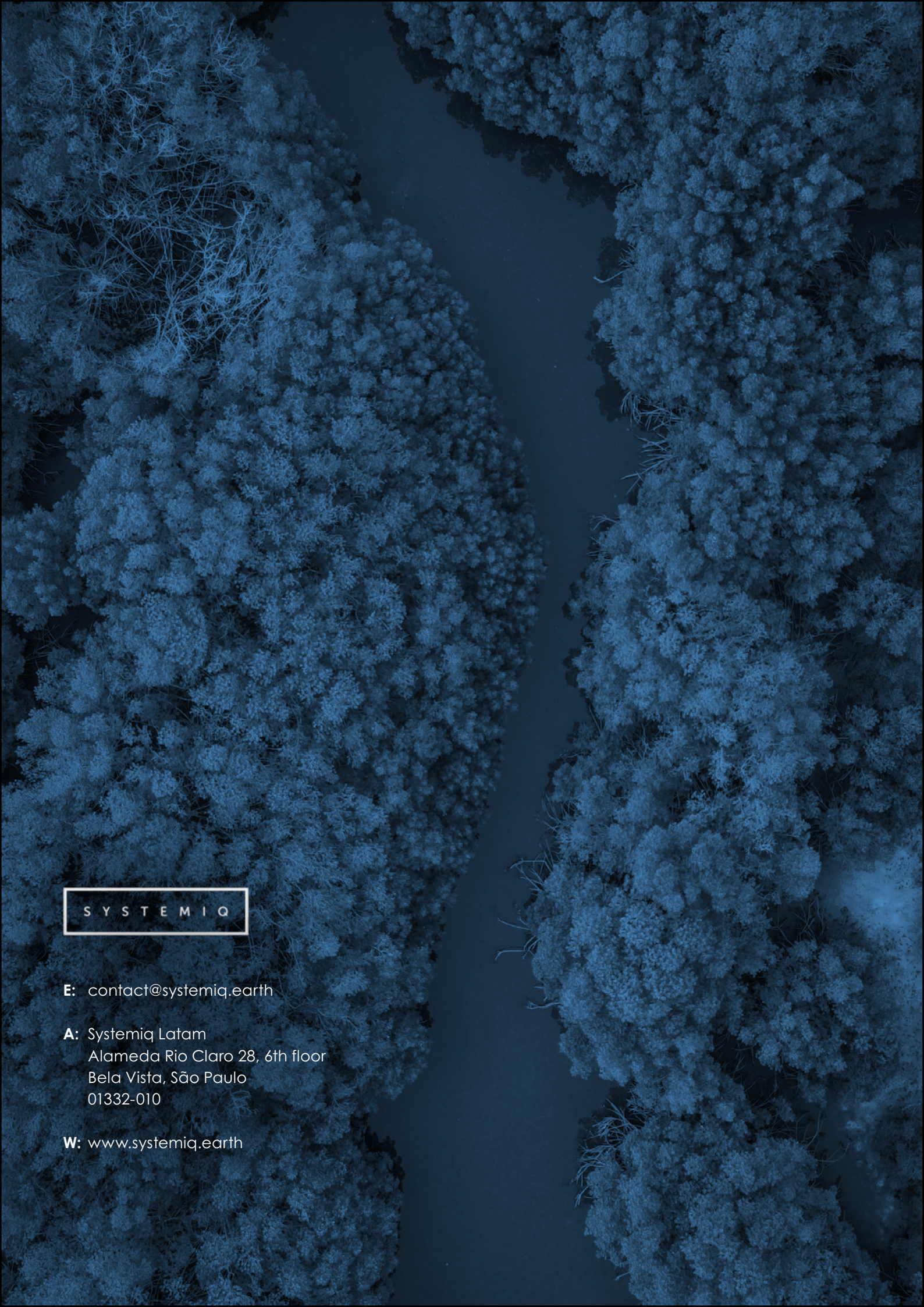
13. Partnerships for Forests - Cocoa Agroforestry Project.

14. Solidaridad.

15. Partnerships for Forests - Ecoflora Project.

16. IPEA. Assistência Técnica na Agricultura Brasileira: Uma análise sobre a origem da orientação técnica por meio do Censo Agropecuário de 2017. Available at: https://repositorio.ipea.gov.br/bitstream/11058/10893/1/td_2704.pdf.

17. Credit Suisse, Caixa Econômica Federal, Bloomberg Green.



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