Case Studies on Blended Finance and Sustainable Investing in Brazil

Edited by
Caroline Flammer & Frederic de Mariz

2025

COLUMBIA | SIPA
Sustainable Investing Research Initiative

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Table of contents

About the editors

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FREDERIC DE MARIZ is Professor of Sustainable Finance and Impact Investing at Columbia University | SIPA. He is a member of SIRI. Frederic is Head of Sustainable Finance at an international investment bank, where he set up the leading franchise in sustainable finance in Brazil, conducting close to 100 transactions and facilitating more than $40 billion in fundraising for companies. He has more than 20 years of experience in investment banking, having received numerous awards. He is also an independent member of the sustainability committees of Sabesp, Wickbold, the Brazilian Capital Markets Association (Anbima) and the Brazilian Institute for Corporate Governance (IBGC). He is the author of several books and academic articles on finance, financial inclusion and sustainability. He received his PhD in Finance from University of Sao Paulo and a Master's degree from Columbia | SIPA.

Foreword
COP30 in Belém is an opportunity to save the Amazon from the tipping point

Carlos Nobre

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Co-Chair of the Scientific Panel for the Amazon-SPA

The Amazon has suffered intense degradation over the past 50 years, with the highest deforestation rate among the world's tropical forests. Annually, for more than a decade until 2022, about 16,000 km² of forest have been cut down on average. More than 1 million km² have already been deforested and another 1 million km2 are degraded.

The combination of deforestation, fire-induced degradation and climate change is causing irreversible damage to the physical structure of the forest, which could collapse by 2050.

The Amazon region has been evolving for tens of millions of years, mainly since the formation of the Andes Mountains, which resulted in the geological, ecological and climatic expansion of the areas with the most abundant and longest rainfall, covering an area of almost 7 million km2 in the Northern part of South America. It can be said that this tropical forest exists thanks to the following key results of this evolution:

The world's greatest biodiversity;

- Huge carbon storage;
- Very efficient water and nutrient recycling;
- Highly humid biome that blocks the spread of fire.

About 13% of all known plant and animal species on Planet Earth are found in the Amazon, with about 50,000 species of plants, 16,000 species of trees, 350 species of primates, 800 species of amphibians and reptiles, 1,330 species of birds and more than 100,000 speces of insects, among many others that are discovered every year.

The forest stores about 150 billion to 200 billion tons of carbon in soil and above-ground vegetation and is a major exporter of water vapor out of the Amazon Basin. These "flying rivers", which release an amount almost identical to the flow of the Amazon River, about 200 thousand m3 per second, feed the hydrological systems of the tropical savannas south of the Amazon and even of central-eastern South America, an important ecosystem service for the planet.

Homo sapiens arrived in the Amazon about 12,000 years ago. When Europeans arrived in the region 500 years ago, there were between 8 and 10 million Indigenous people, more than 1,300 ethnic groups with more than 1,000 Indigenous languages. All these populations have always maintained the forest and its biodiversity. And, with the remarkable evolution of Indigenous science, they used more than 2,300 products from terrestrial and aquatic ecosystems and domesticated many plants, such as cassava, Brazil nuts, açaí and cocoa.

All of this is at risk.

The fire used by criminals and land grabbers is the most serious threat to the biome. After a fire, the physical structure of the forest changes significantly. More than 100,000 fires are detected in the Amazon annually, more than 90% of them caused by man. Fire destroys roots, trunks, branches, leaves, seeds and fruits essential for regeneration and consumption.

In addition, forest fires release carbon monoxide and microparticles into the atmosphere, causing serious health problems for humans. In the Brazilian Amazon alone, an average of 150 thousand cases of respiratory and cardiovascular diseases related to fire smoke are diagnosed annually.

The synergistic combination of deforestation, fire-induced degradation and climate change is causing irreversible damage to the physical structure of the forest. If deforestation continues at the same rates as in recent decades and global warming significantly exceeds 1.5°C, the forest will exceed its tipping point, which could lead to between 50% to 70% of the forest turning into highly degraded open-canopy ecosystems.

I was the first scientist to publish scientific articles on this risk in 1990 in the Journal Science and in 1991 in the Journal of Climate.

Now, many observations in the Amazon show how close the forest is to a tipping point: the dry season is now 4 to 5 weeks longer in the entire southern Amazon since 1979, affecting more than 2 million km²; tree mortality is increasing; the dry season is 2ºC to 3ºC warmer and 20% to 30% drier in the southeastern Amazon, and the forest in that region has become a carbon source.

The heavily deforested areas of the southern Amazon have recycled less water, and the atmosphere is becoming warmer and drier. In addition, climate change related to global warming induces severe and frequent droughts, such as in 2005, 2010, 2015-2016, and the most severe in history: 2023-2024. Recent studies indicate that if the dry season continues to lengthen, the irreversible tipping point will be reached by 2050. In this case, between 50% to 70% of the forest would degrade within 30 to 50 years. This would release more than 250 billion tons of CO2 and lead to the extinction of hundreds of thousands of species of the richest biodiversity on the planet.

COP30 in Belém in November 2025

COP30 (30th Conference of the Parties on Climate Change) will be decisive for the future of the Amazon and the populations that live in it.

COP30 will be the first meeting of the UNFCCC (United Nations Framework Convention on Climate Change) held in the Amazon and represents a crucial

opportunity — and possibly the last — to debate and forward solutions capable of protecting all biomes on the planet, especially preventing the Amazon rainforest from exceeding the limits of the tipping point. The collapse of the Amazon would compromise not only its biodiversity and the peoples who depend on it, but also the planet's climate, especially in South America.

How to prevent this from happening?

Zero deforestation is an essential condition

First of all, it is essential to put an end to deforestation, forest degradation and fires. Currently, about 20% of the Amazon rainforest has already been deforested. To reach zero deforestation, it is necessary to strengthen transnational governance in the region. In addition, it is imperative to comply with the Paris Agreement by limiting warming to 2°C – ideally not permanently exceeding 1.5°C. In 2024, the average global temperature was 1.55°C above the pre-industrial period (1850-1900).

This urgency is due to the fact that the combination of deforestation between 20% and 25% with an average increase in global temperature between 2°C and 2.5°C will bring the Amazon to the point of no return. This would mean a transition to a new climatic and ecological state, with between 50% and 70% of the forest being converted to degraded savanna-like vegetation. Only the western and northwestern region, close to the Andes Mountains, would maintain significant remnants of forest.

If these limits are exceeded, there will be severe impacts on rainfall, agricultural and forestry productivity, global greenhouse gas emissions, and biological and cultural diversity. This would aggravate inequalities in the Amazon, imposing a vicious cycle of environmental degradation and social injustice that is difficult to overcome.

Nature-based solutions to avoid the tipping point

We urgently need to address the challenges and opportunities related to forest restoration, innovation strategies, and bioindustrialization as paths to sustainable development in the Amazon. These measures simultaneously make it possible to capture carbon from the atmosphere and produce food and raw materials that can strengthen food security and boost the industrialization of technology-intensive biodiversity products.

I also highlight the legacy of indigenous peoples and the production of renewable energy as nature-based solutions to move the Amazon away from the point of no return.

Legacy of Indigenous Peoples

For Indigenous Peoples, everything in the forest is sacred—an ancestral knowledge from which non-Indigenous society has much to learn to conserve the Amazon.

The indigenous occupation of the Amazon, more than 12,000 years ago, resulted in the current 1.15 million square kilometers of Indigenous Lands. This represents 23% of the Brazilian Amazon, an area responsible for 25% of the rainfall produced in the region. These rains are transported by flying rivers beyond the forest, contributing to water supply and agricultural production in several other parts of Brazil, such as the Cerrado, the basins of the Paraná and Prata rivers, and also the Southeast.

The Indigenous presence in the Amazon was crucial for the globalization of biodiversity. Dozens of native species, such as cassava, pepper, annatto, murumuru, Brazil nuts, cocoa, andiroba, copaiba and açaí, are now patented and consumed in various parts of the world. In all, the use of about 2,300 native species was reported by Indigenous People to scientists and naturalists, generating numerous benefits for the cosmetics, food, pharmaceutical and biotechnology industries.

Moreover, much of this knowledge is available only in Indigenous languages — knowledge that can be carefully accessed for the benefit of local populations.

Renewable energy from biodiversity

Another promising strategy is the production of renewable energy from waste from Amazonian biodiversity. The biomass generated by the processing of fruits such as açaí and Brazil nuts has been studied for decades as an energy source.

These residues represent about 60% of the weight of the fruits. In the States of Amazonas and Pará alone, it is estimated that 1.7 million tons of fruits are sold annually, generating about 1 million tons of usable waste. With a calorific value between 17 and 19 MJ/kg, these residues can produce between 4.72 and 5.28 millions MWh of gross thermal energy.

Considering an efficiency of 25% in the conversion of this thermal energy into electricity, the volume generated can reach between 1.18 and 1.32 million MWh per year – enough energy to supply the approximately 200 thousand homes in the Brazilian Amazon that are still outside the conventional electricity grid. Other complementary alternatives include the use of solar radiation, captured by photovoltaic panels, and hydrokinetic energy, obtained directly by turbines installed in the current of the rivers.

A global call to act now

COP30 in Belém in November 2025 is a historic meeting: either we advance on real solutions — integrating science, technology, local knowledge, and political will — or we will witness the point of no return for the largest biological reserve and supplier of rainfall on the earth's surface.

The world cannot fail the Amazon.

Protecting the forest and local populations is a global duty, and keeping it alive and connected is crucial to the future of humanity.

Introduction Attracting funding to scale with impact[1]

Caroline Flammer &
Frédéric de Mariz

1. The editors would like to thank Mirova, Sabesp, SIMFO, and Vale for their support in organizing the 3rd SIRI Blended Finance Roundtable Discussion that took place at Columbia University on June 13, 2025. The editors thank Thomas J. Trebat, director of the Columbia Global Centers | Rio de Janeiro. The editors and authors also thank Hadrien Leon de Mariz from George Washington University and Rafael Leifert from Yale University for their research assistance.

Climate change and biodiversity loss pose existential threats to our way of life—indeed to all life on Earth—and are tightly intertwined with other systemic challenges such as poverty and social inequality. The mitigation of climate change, biodiversity loss, poverty, and other grand societal challenges has historically been primarily financed through public funding and private philanthropic giving. Yet, a large financing gap remains, especially in the Global South, to effectively address the climate and biodiversity crises and other grand societal crises, especially in a context of constrained public finances. With the aim of closing this financing gap, the practice of blended finance has emerged in recent years. Private capital is "blended" with public or philanthropic capital, whose aim is to subsidize and de-risk private capital investments to mobilize more capital and finance innovative solutions that address these crises. This can include investable projects in renewable energy, climate technology, nature-based solutions, regenerative agriculture, reforestation, social inclusion, and others.

Once marginal and self-regulated, sustainable finance has evolved into a quickly growing segment that encompasses several asset classes and incorporates environmental, social, and governance (ESG) considerations, with innovative financial instruments using labels such as green, social, sustainability-linked or impact. Among those instruments, issuance of labelled bonds reached approximately $1 trillion in 2024. Markets estimates suggest ESG assets could make up about 25% of total assets under management by 2030 globally, representing $40 trillion, even though recent industry data suggest growth of those assets could be muted in the short term. Each region of the globe presents idiosyncrasies, with Europe representing the largest market for those assets and emerging markets growing in the total pool.

Within the growing field of sustainable finance, blended finance - while not novel - is still in its infancy, with a near complete lack of academic research studying the topic. A better understanding of the current practices in blended finance is critical to grow the impact of projects with positive social and environmental contributions. This includes understanding the challenges and opportunities that arise to identify and scale up investable projects, the characteristics of effective private-public partnerships, the balancing and allocation of risks across investors, how to improve financing structures, and how to speed up the scaling up of the blended finance market, among others. Developing sustainable investing, and in particular blended finance, has the potential to mobilize more private capital investments and achieve impact.

Climate Week 2024 underscored the urgency of scaling innovative financing solutions to address the $4 trillion annual shortfall in funding required to meet

the Sustainable Development Goals and the Paris Agreement. Despite growing momentum, only $200 billion have been mobilized to date in blended finance instruments. The lack of standardized structures and long incubation periods for each new vehicle remain key obstacles to achieving the scale and speed required. Notable initiatives such as the Blue Dot Network and the Fast-Infra Label demonstrate how certification frameworks can enhance transparency, promote trust, and reduce transaction costs.

Yet, simply using blended finance has not been enough to scale up capital flows into the Global South and promote sustainable development outcomes. Critical to increasing the supply of investable projects and the creation of innovative solutions is the strengthening of financial incentives. Sustainable finance will not scale and reach its expected impact if it does not offer a compelling return to market participants. The use of limited sources of catalytic capital should focus on supporting demonstration projects, catalyzing new markets, creating the infrastructure that will crowd in private capital, and demonstrate the viability of investments rather than just subsidizing individual projects indefinitely.

To speed up the mobilization of private capital and maximize impact, it is important to create replicable financing structures, make progress in the measurement of sustainable development impact, lower the cost of compliance and reporting by leveraging AI and enhance data transparency, improve understanding among institutional investors and ensure that public funds be only used in case of market failure.[2]

We also underscore the importance to train and educate the current and future generations of private, public, and investors, corporate executives, policymakers, and other world leaders. This is where academia plays a particularly important role to disseminate best practices and case studies, help define better measures of impact, and promote dialogue and exchanges between participants with diverse background and perspectives. In that context, the SIRI Blended Finance Annual Conference and Roundtable Discussions hosted at Columbia University are SIRI's contribution to a fruitful dialogue. While those events are crucial to bring knowledge about the Global South to a wider audience and promote networking opportunities, we also aim to fulfill our mission as an institution that fosters knowledge creation and dissemination through academic research and the development of case studies. Case studies can serve as valuable illustrations of the challenges faced in blended finance and showcase best practices, hereby helping increase awareness and understanding among the broader public and relevant players in the field. These case studies also offer training material for graduate students and executive education, hence the importance of making them available to a large audience.

2. Flammer, C., Giroux T., and Heal, G., 2024. Blended Finance, NBER. Doi: 10.3386/w32287

The 3rd SIRI Blended Finance Roundtable Discussion focused on Brazil. As host of the Conference of the Parties - COP30, which will take place in November 2025 at the heart of the Amazon in Belém, Brazil makes a case for development that goes hand in hand with environmental protection and the well-being of communities, including traditional and indigenous groups.

Brazil has a long history of leadership in sustainability, including the landmark United Nations Earth Summit organized in Rio de Janeiro in 1992. Regulators, including the Brazil Central Bank and Securities and Exchange Commission – CVM have incorporated sustainability into regulation and supervision for more than a decade. The path to Belém and COP30 has coincided with or accelerated a flurry of initiatives in Brazil, such as the adoption of IFRS Sustainability Disclosure Standards in 2023 with mandatory implementation starting 2026, the adoption in Congress of a cap-and-trade system for carbon emissions in 2024, the development of a Brazilian Taxonomy in 2025 and the launch of Eco Invest: a platform for blended finance and foreign exchange hedging.

Launched in 2024, the "Eco Invest Brasil" program is a government-led initiative in partnership with the IDB designed to attract international capital toward projects with measurable environmental and social benefits. By mobilizing private finance for sectors such as reforestation, regenerative agriculture, clean energy, and sustainable infrastructure, the program directly contributes to carbon emission reductions, biodiversity restoration, and inclusive economic development in rural and vulnerable regions. To overcome structural investment barriers—such as currency risk and high capital costs—Eco Invest offers a suite of financial instruments, including blended finance with concessional rates, foreign currency liquidity facilities, and hedging tools.[3]

Sustainable finance in Brazil faces similar challenges to other markets, such as the need for improved standardization of taxonomies, a clearer fiduciary duty for asset managers to include ESG in their investment allocation, clear fund labeling, and more consistent disclosure and verification with a focus on impact.

Overall, our research and conversations with practitioners have pointed to three necessary conditions to make blended finance structures successful. Market participants need to ensure that the project has clear and quantifiable addition-

3. See more information at https://www.gov.br/tesouronacional/en/sustainable-finance

ality in order to attract catalytic capital; identify the minimum degree of concessionality and guarantees needed to crowd in commercial capital and define the breakdown of the capital stack; and ensure that the project and company have a path to commercial viability without needing ongoing subsidies.

Our interactions with dozens of practitioners also pointed to the need to better map existing sources of catalytic capital, reduce the cost to structure those transactions and increase awareness and understanding on those instruments.

We hope those case studies will support the ongoing growth of sustainable finance.

KPTL is a venture capital manager founded in 2003, with $180 million in assets under management in 10 funds, and an investment thesis focused on scalable innovation in sectors with high impact. The fund has supported 20 startups and contributed in particular with the launch of two vehicles in the nature and climate space (Amazonia Regenerate, Forest and Climate Tech). Their fundraising journey highlights the difficulty to orchestrate collaboration between many parties with the proper sequencing, the elevated cost of structuring as well as the need to be flexible in the impact measurement of start-ups with limited bandwidth. Through resilience, KPTL fund managers restructured the fund's design, developed a de-risking solution via a philanthropic credit vehicle, and launched a second impact fund focused on the Amazon, consolidating the initiative as a relevant example of blended finance applied to early-stage venture capital.

Mirova's Land Degradation Neutrality Fund mobilizes private capital for sustainable land management in emerging markets. Launched in 2017 and managing $208 million in assets, the LDN Fund invests in commercially viable projects across planted forests, agroforestry, and agro-ecological transitions in Africa, Latin America, and Asia through long-term debt and equity. Using blended finance, the fund unlocks capital for projects with positive impacts that may otherwise struggle to secure funding under typical market conditions. Through its 13 projects, the LDN Fund addresses key Sustainable Development Goals related to poverty, hunger, climate action, gender equality, and life on land, among others. Best-practice recommendations include the importance of clearly communicating risk mitigation benefits to senior investors, the significance of establishing relevant impact objectives, and the use of technical assistance alongside equity, debt and self-liquidating instruments

With Sabesp – the third largest water and sanitation company globally serving close to 30 million customers – the challenge and impact was clear. With a large population still lacking access to clean drinking water and to sanitation, universalization was the basis of the company's strategy and also its ultimate impact.

Universalization happens only once in the history of a country, making Sabesp and other companies in the water sector natural recipients of public funding and multilateral lines. The challenge to fund expansion– in the tune of billions of dollars – has little to do with a change in the company's operations and more with an institutional change – namely the privatization of the company – and with management's strategy to be more agile, reach new pools of capital and focus on its real impact.

Vale – one of the largest mining companies globally – reformulated its mission to put sustainability at the core of its business strategy, reducing direct and indirect impacts, while growing its positive impact, increasing the resilience of its operations and investing in its social license to operate. Vale underscores its positive impact through the mining of ores essential to the energy transition, the social development of isolated regions, and the protection and restoration of vast swaths of land. Fundo Vale is essential to the implementation of this vision, funding projects linked to reforestation and bioeconomy and benefiting territories where the company is present, especially in the Amazon.

The sheer scale, scope, and complexity of these challenges call for multi-disciplinary research and collaborations between academia and practitioners. The case studies presented in this book highlight the challenges and opportunities of crowding in more private capital to finance innovative solutions in climate tech, nature-based solutions, renewable energy, social innovations, and more. Issuers and asset managers should focus less on a glossy narrative and develop a credible transition strategy with specific, ambitious, and measurable commitments in order to reach real impact. Expectations and levels of requirement will continue to rise globally. These case studies offer compelling insights into the growth of sustainable and blended finance.[4]

With its economic relevance, global connectivity with all trading blocks, vibrant culture and unique natural assets, Brazil is in a key position to become a center of innovation and excellence in sustainable finance.

4. de Mariz, F. The Promise of Sustainable Finance: Lessons From Brazil. Georgetown Journal of International Affairs, vol. 23 no. 2, 2022, p. 185-190. https://dx.doi.org/10.1353/gia.2022.0030

KPTL Venture Capital to scale impact in the Amazon

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Abstract

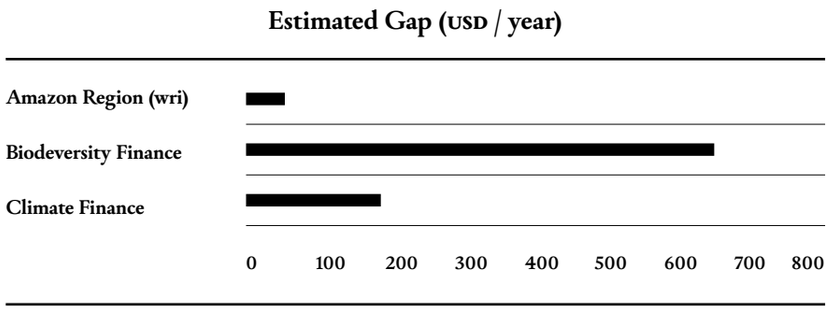
This case study analyzes the experience of KPTL, one of Brazil's leading venture capital funds focused on innovation, in its attempt to structure a socio-environmental impact fund based on blended finance mechanisms, particularly the use of first-loss capital. The fund combines philanthropic and commercial resources to enable investments in startups focused on forest restoration, bioeconomy, and green transition, especially in the Amazon region. The Forest & Climate Tech fund, launched with initial target to raise approximately $40 million of capital, faced significant barriers. The lack of firm commitments from anchor investors during fundraising process compromised its scale, demonstrating that the viability of hybrid structures depends on prior alignment with public and philanthropic actors. The case reveals a critical misalignment between stakeholders with heterogeneous expectations on risk and return. Furthermore, the adopted model imposed operational challenges, including high impact measurement costs and difficulties in engaging early-stage investees technically. Despite those headwinds, KPTL demonstrated resilience and adopted a strategic reformulation, through a non-profit entity that provides subsidized credit to investees, a solution more aligned with expectations of philanthropic investors. The experience also generated reputational capital and strategic learning. The case illustrates the potential to foster sustainable development in a region like the Amazon and the determination of select entrepreneurs and fund managers; it also highlights the limits between sustainable investment and its practical execution in emerging markets, underscoring the importance of clear legal structures, robust metrics, and committed partners. It also reflects legal and governance barriers to scaling blended finance in Brazil.

1. Blended Finance in the Context of the Global South

In recent decades, sustainable finance has been consolidating as a central agenda to align private capital flows with global environmental and social challenges, driven by investors preferences, fiduciary duty and regulations among other factors. The global sustainable finance market moved approximately USD 6.0 trillion in 2024 and is expected to reach USD 36.8 trillion by 2034, driven by an estimated average annual growth rate of 19.9% (Global Market Insights, 2025). In Brazil, this field has progressed with the support of multilateral organizations, development banks, and companies, although it still faces significant obstacles, such as limited uptake with investors, greenwashing risk and low standardization in impact measurement (Deschryver & de Mariz, 2020).

The strategic relevance of blended finance structures is reinforced by international climate financing and development goals. Estimates from NGFS (2023) indicate that developing countries will need to mobilize around USD 1 trillion per year by 2030 to address the challenges of the climate transition. According to the OECD (2023), the current pace of mobilization through blended finance needs to quadruple to cover at least 20% of the SDG financing gap, underscores the need to scale hybrid financing mechanisms.

Despite growing awareness and funding commitments, actual capital flows remain far below the levels required to meet global environmental goals. Current estimates indicate that climate finance mobilizes approximately USD 653 billion per year, while biodiversity-related flows amount to around USD 124 billion annually. These graphic still fall dramatically short of what is needed to address climate change and ecosystem degradation. The graphic below illustrates the scale of the financing



GRAPHIC 1 – Annual Financing Gaps and Current Capital in Climate, Biodiversity, and the Amazon Region.
SOURCE: Climate Policy Initiative (2024); UNEP (2024); WRI (2023).

gaps across three key areas: climate, biodiversity, and the Amazon region (Climate Policy Initiative, 2024; UNEP, 2024; WRI, 2023).

The disparity between existing capital flows and financing needs is stark. According to the Climate Policy Initiative (2024), climate finance currently mobilizes around USD 653 billion per year, yet still falls short by over USD 200 billion annually. In biodiversity-related sectors, UNEP (2024) estimates a much larger gap of approximately USD 700 billion, with only USD 124 billion currently allocated. For the Amazon region specifically, the World Resources Institute (2023) reports that more than USD 43 billion in investments would be necessary to implement nature-based solutions at scale. These figures underscore the urgency of expanding blended finance mechanisms to close these critical funding gaps and mobilize private capital where public funding remains insufficient

Between December 2023 and October 2024, the sustainable fund market in Brazil experienced significant growth, with the number of funds classified as sustainable increasing from 134 to 257 and net inflows of USD 2.2 billion—ten times higher than the previous year (Anbima, 2025). Boosted by the rise in the Brazilian policy rate – the Selic, which stood at 14.75% in May 2025 – fixed income instruments represent 63% of allocations. The classification rules for "sustainable investment funds - IS", and well as the guidelines for issuers of labelled instruments launched by the capital markets association ANBIMA in 2022 reinforce the credibility and support the growth of ESG investments in the country. That said, "IS" funds account for only 0.2% of the Brazilian fund industry, while labelled fixed income instruments represent around 10% of total debt issuance. Innovative financial instruments such as impact funds, sustainability-linked bonds, and blended finance mechanisms have been mobilized to expand the reach and effectiveness of sustainable finance.

Between 2012 and 2024, blended finance structures mobilized approximately USD 213 billion globally, with particular emphasis on 2023, when the total volume of new transactions reached USD 15 billion—the highest in five years. Sectors such as renewable energy (47% of the total mobilized) and climate agriculture (16%) led in transactions, especially in regions like Latin America and Sub-Saharan Africa (Convergence, 2024).

The term blended finance refers to the strategic use of public or philanthropic resources to attract private capital to projects with socio-environmental impact. This arrangement seeks to align interests among investors with different risk and return profiles, allowing concessional capital to act as a risk mitigator, amplifying the multiplier effect and crowding in private resources. In practice, instruments such as guarantees, subordinated tranches (also referred to as junior tranches), pref-

erential loans, and result-based donations can be used to increase funds available to a project. They act as a shield for private investors with a traditional market-aligned return expectation. Blended finance is particularly effective in contexts where perceived risk is high and social returns are not directly captured by traditional investors (OECD, 2020).

Blended finance gained prominence as an effective strategy for mobilizing private capital in sectors with market failures, especially when there is a misalignment between perceived risk and direct financial returns (Flammer et al., 2024). The main providers of concessional capital (i.e., with more flexible conditions to leverage private capital) include:

- Multilateral organizations such as the IFC, IDB, and the World Bank;
- International development cooperation agencies and development banks, such as USAID, KfW, FCDO, AFD;
- Global philanthropic foundations, such as Rockefeller, Ford, and Gates Foundation;
- Development banks, such as BNDES in Brazil.

Venture capital (VC) plays a crucial role in promoting innovation by investing in startups and emerging companies, in particular those that develop technological solutions. Select invested companies by VC funds target financial returns and promote solutions to address social and environmental challenges at the same time. However, the high uncertainty associated with this type of investment demands risk mitigation mechanisms to attract private capital. First-loss capital can reduce the perceived risk for investors and enable the leveraging of resources for less consolidated but high-impact potential sectors.

Although the concept of first-loss is widely promoted by multilateral institutions and development agencies, capital available for this type of mechanism is relatively scarce and concentrated in a few institutions, such as multilateral banks and major international foundations. Moreover, capital is concentrated geographically, in regions with better institutional and regulatory structures. Between 2012 and 2018, only about 6% of private financing mobilized through first-loss structures was directed to the least developed countries (LDCs), while more than 70% were allocated to middle-income countries (OECD, 2021).

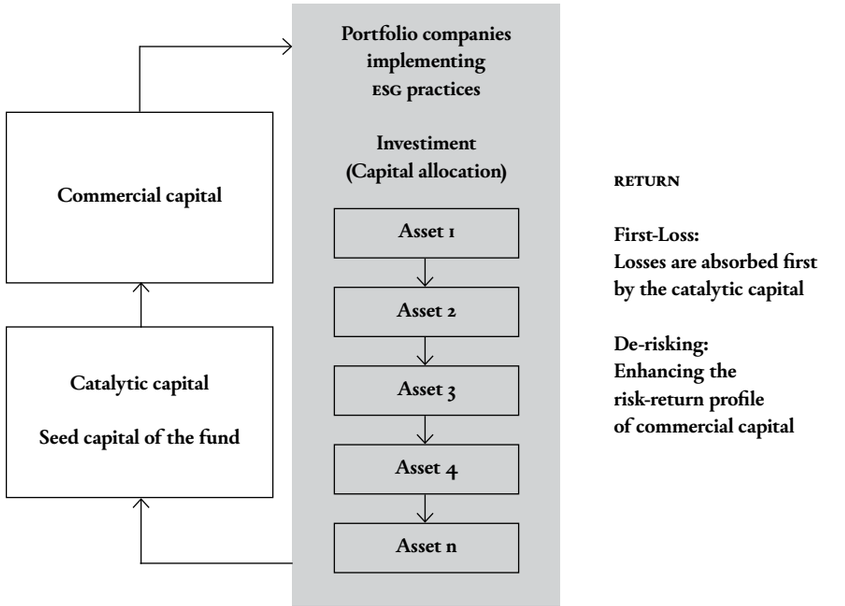


FIGURE 1. Blended Finance, First-Loss and De-risking Model
SOURCE: Prepared by the authors (2025)

Blended finance structures have increasingly been recognized as critical tools to mobilize private investment in sectors with high environmental and social returns but elevated perceived risks as presented figure 1. As Prasad et al. (2022) argue, first-loss capital mechanisms play a pivotal role in reallocating risk within financing structures, thus enhancing the bankability of projects in emerging markets. The success of such mechanisms, however, depends not only on financial engineering but also on strong governance and transparent performance frameworks. In countries like Brazil, where institutional uncertainty persists, these elements are especially critical to ensure investor confidence and long-term capital mobilization.

A growing body of literature has explored the relationship between sustainability performance and financial outcomes. For instance, Flammer (2021) and Friede, Busch, and Bassen (2015) find a positive correlation between sustainability strategies and firm value across multiple contexts and asset classes. However, this relationship remains contested. Raghunandan and Rajgopal (2022) highlight

that ESG performance does not necessarily translate into superior valuation and may, in some cases, reduce firm value due to agency costs or greenwashing risks. When it comes to risk, though, the evidence is more consistent. Albuquerque et al. (2020) show that firms with stronger sustainability profiles tend to exhibit lower stock return volatility, especially during periods of market stress, indicating that sustainability can serve as a valuable risk-mitigation strategy.

KPTL is a venture capital fund, with $180 million in assets under management and an investment thesis focused on scalable innovation in sectors with high impact. Founded in 2003, the fund has contributed with the launch of two Amazon-focused investment vehicles, supporting over 20 startups in environmental and social impact sectors. Their fundraising journey highlights the difficulty to orchestrate collaboration between many parties with the proper sequencing, the elevated cost of structuring as well as the need to be flexible and creative in the impact measurement of start-ups with limited bandwidth. Through resilience, KPTL fund managers restructured the fund's design, developed a de-risking solution via a philanthropic credit vehicle, and launched a second impact fund focused on the Amazon, consolidating the initiative as a relevant example of blended finance applied to early-stage venture capital.

In Brazil, various public initiatives support first-loss structures aimed at attracting private capital into sustainable investments. Public development institutions have acted as both direct financiers and investors in impact funds, participating in senior and junior tranches across different structures. In 2024, the Brazilian Federal government, via its Finance Ministry, launched the Eco Invest Brasil program, aiming to mobilize up to USD 2 billion for climate projects through a blended finance approach. The articulation between public and private actors is essential to unlock investments in climate and development (Bhattacharya et al., 2022). However, the execution of such structures in Brazil has encountered institutional limitations, lack of contractual standardization, and fluctuating public-sector engagement. These barriers are common in hybrid financing models, especially in complex sectors like sustainable agriculture (Havemann et al., 2022). In KPTL's case, some of these limitations materialized during early attempts to structure a fund combining concessional and commercial capital.

In the blended finance mechanism that incorporates the first-loss strategy, the capital structure diverges from the traditional model. In this context, first-loss investors assume the initial layer of risk in cases of default or underperformance of the project, providing a protective cushion for other investors. If the subordinated credit is structured to be paid only after shareholders – as mentioned – it results in an inversion of the typical payment priority. Unlike conventional logic,

where debt holds precedence over equity, this arrangement elevates the risk associated with debt, as its repayment is contingent upon the returns generated for shareholders. This characteristic is designed to attract private capital to high-impact, high-risk projects, mitigating potential losses for traditional investors while amplifying the reach of the investment. Therefore, it is crucial to highlight that this inversion in the capital structure is a defining factor in enabling higher-risk socio-environmental projects, aligning financial returns with positive impact.

To better understand the blended structure designed by KPTL, the diagram below illustrates the different sources of capital that compose the Forest & Climate Tech fund. Each component (grant, subordinated credit, and equity) has a distinct function and risk profile, strategically arranged to attract commercial investors. Under this structure, the capital stack appears as inverted, as subordinated holders bear more risk than equity holders.

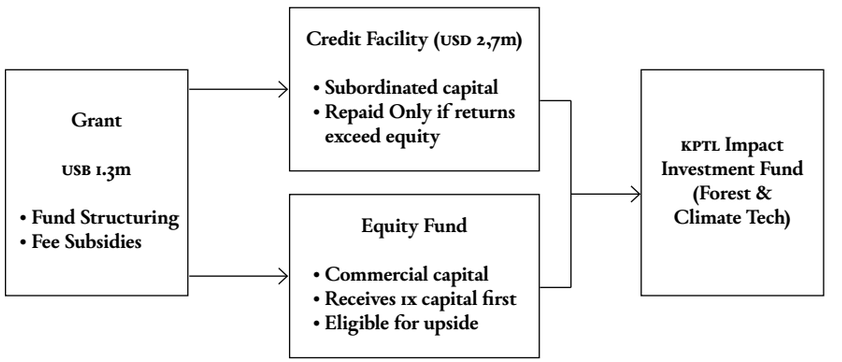


FIGURE 1. Capital Sources in KPTL's Blended Finance Model
SOURCE: Adapted from "KPTL Nature & Climate Funds" (2024).

The grant, amounting to USD 1.3 million, is non-reimbursable and earmarked for fund structuring and operational support, enabling the team to reduce management costs and establish the pipeline. The subordinated credit facility (USD 3.5 million) absorbs the initial investment losses, acting as a cushion for the senior capital. The holder of this subordinated tranche typically may have restrictions to own an equity stake. Finally, the equity fund (USD 30 million) constitutes the main financial vehicle, with private investors benefitting from prioritized returns. This composition

seeks to align incentives among stakeholders with different expectations of risk, return, and impact.

One of the strategic areas for advancing sustainable finance in Brazil is reforestation. Forest restoration directly contributes to climate change mitigation, biodiversity conservation, and the recovery of degraded areas—fundamental objectives in a country with 66% of its territory covered by forest and facing high rates of illegal deforestation. As an economic activity, reforestation still faces challenges of scale, cost, and valuation. For this reason, it has been the focus of various public policies and financial mechanisms designed to foster innovation and impact. Recent programs and public calls have sought to expand financing for agroforestry solutions by leveraging private investment through blended finance approaches, including first-loss structures and catalytic capital (Convergence, 2022; IDB Lab, 2023).

KPTL's unique experience, analyzed in this case study, illustrates how this rationale was incorporated—and the challenges faced in attempting to implement it in the Brazilian financial and capital markets. This analysis is complemented by primary evidence collected through an in-depth interview with two key team members involved in the initiative: Danilo Zelinski, a partner and fund manager at KPTL, and Isadora Barbosa, part of the fund structuring and operations team.

With over two decades of operation in the venture capital ecosystem, KPTL integrated the impact theme into its strategy in 2013, when it launched FIMA – Environmental Innovation Fund, one of the first funds with this orientation in Latin America. KPTL emerged from the merger between Inseed Investimentos, founded by Gustavo Junqueira, Alexandre Alves, Paulo Renato, Gustavo Mamão and Felipe Matos, and A5 Capital Partners, founded by Renato Ramalho and Paulo Humberg. Both founding partners played a central role in leading the shift toward sustainable innovation in early-stage investing in Brazil and Latin America. Today, KPTL manages around USD 180 million in 10 investment vehicles, being one of the largest innovation platform in Latin America with a thesis focused especially on reforestation and bioeconomy.

KPTL aims to generate financial returns in sectors with a view on macro themes such as a rising focus on climate change, while aligning its venture capital strategy with long-term environmental goals. The firm mobilizes innovative financial instruments to enable impact in sectors with high operational complexity. Even well-established multilateral funds such as the Green Climate Fund face similar difficulties (Amighini et al., 2022). The case of KPTL examines how to associate sustainability with investment fund structures in contexts where the trade-offs between risk and return, investor confidence, and impact measurement remain persistent barriers. As Danilo summarized, "The real challenge isn't just financial structuring, it's convincing people that this model is viable in a country with institutional noise.". We ask in particular

how KPTL integrated ESG principles and blended finance mechanisms such as first-loss into its investment strategy. What lessons emerge from the process of designing impact-driven financial structures? And what institutional and market conditions are necessary to scale sustainable finance in emerging economies like Brazil?

KPTL provides insights into VC structures with first-loss mechanisms in the field of reforestation and bioeconomy. Their experience evidences the tension between impact discourse and the operational and institutional limits of implementing it. It shows how an impact narrative can make fundraising more complicated. It is the story not just of technical dilemma but of the ambition and the resilience of managers to drive change through institutional innovation.

2. Sustainable Finance and the Role of First-los

2.1. Why and how KPTL integrates sustainability?

KPTL adopts an approach that seeks to integrate socio-environmental impact organically into its innovation-driven investment thesis. Sustainability does not appear as a secondary or external criterion but as a cross-cutting filter in the strategy for selecting and monitoring portfolio companies. This integration occurs both thematically—with a deliberate focus on sectors such as reforestation, bioeconomy, clean energy, and urban solutions—and through the due diligence and monitoring process.

The decision to invest in impact-driven companies was not based on an ethical conviction but on a strategic assessment:

> "Businesses that solve real problems tend to be more resilient in the long term and better prepared to respond to the demands of regulated markets and conscious consumers." Danilo Zelinski

This logic is reflected in the company's structure, formed from the merger of two investment firms: Inseed Investimentos, with a history in impact-oriented venture capital, and A5 Capital Partners, with experience in technology and scalability. The union of these funds gave rise to a platform focused on purpose-driven innovation. The platform now counts 10 funds. KPTL's Forest & Climate Tech was structured as an environmental impact fund, backed by anchor investors from both public development institutions and private asset managers.

In 2021, KPTL launched the GovTech fund, focusing on digital solutions for mass public services. Although the thesis was strongly associated with social impact, the fund was not labeled as an impact fund due to concerns that this classification might hinder fundraising from private investors at that time.

In 2022, KPTL launched the Forest & Climate Tech, structured in partnership with Fundo Vale. With a target capital of USD 40 million, the fund seeks to invest in startups offering technological solutions for forest restoration, traceability, and certification of carbon credits, as well as innovations in bioeconomy and regenerative economy. The initiative has a 10-year horizon, with the possibility of extension, and aims to support between 20 and 30 companies over the next five years.

> "From the beginning, we wanted a structure robust enough for institutional investors, but also flexible enough to handle startups with different levels of maturity." Isadora Barbosa

Moreover, KPTL currently manages two impact-oriented funds that reflect its dual strategy in climate and biodiversity finance. While both adopt a 10-year horizon and target early-stage companies, they differ in sectoral focus, investment profiles, and geographic scope. The table below offers a comparative overview of the Amazon Regenerate Fund and the Forest & Climate Tech Fund.

Fund Name	Size (USD)	Investment Focus	Target Companies	Duration	Stage
Amazon Regenerate Fund	$30M	Bioeconomy (Biopharma, Bioagri, Bioservices)	15–20	10 years	MVP stage
Forest & Climate Tech	$40–50M	Forest Tech, Decarbonization, Regenerative Economy	20–30	10 years	Pre-seed to Series A

TABLE 1: Structural Comparison between KPTL's Impact Funds
SOURCE: Adapted from "KPTL Nature & Climate Funds" (2024).

The Amazon Regenerate Fund prioritizes bioeconomy ventures with tested MVPs and strong regional ties, aiming to scale solutions within the Amazon biome. In

contrast, the Forest & Climate Tech Fund adopts a broader approach, targeting technologies for decarbonization and regenerative agriculture across Brazil and Latin America. Together, they exemplify KPTL's intent to integrate purpose-driven investment with scalable innovation.

KPTL decision makers enhanced their understanding of blended finance mechanisms through engagement with technical partners. This learning informed the design of Forest & Climate Tech, launched in 2022 with a structure aligned to de-risking strategies for impact investments.

The investment decision-making process involves assigning qualitative and quantitative scores to the evaluated startups, considering both the potential return and the generated impacts. KPTL uses tools such as impact scorecards, non-financial risk analysis, and thematic criteria that guide sector-based allocation. In the case of KPTL Forest & Climate Tech, the investment thesis prioritizes technologies that promote the traceability of plantations, the certification of carbon credits, and the engagement of local communities. During the life of the investment, managers remain actively involved with the investees through a model of active governance, participating in boards and strategic committees. The fund's structure incorporated first-loss elements to attract philanthropic capital aimed at reducing risks and crowding in private investors.

Fundraising from private investors is now increasingly conditioned on the clarity with which the impact proposition is structured and methodologically supported. KPTL highlights that the market has changed: whereas in the past, talking about impact was an obstacle to fundraising, today it is almost a requirement—as long as the narrative is accompanied by structure, methodology, and long-term commitment. The methodological consistency of this approach is reflected in the adoption of international frameworks, such as the Impact Management Project (IMP), the IRIS+ metric, and the ESG assessment model in matrix form, which enables the consolidation of qualitative and quantitative indicators in an integrated manner.

Academic research has increasingly emphasized that sustainability-oriented strategies can enhance long-term firm performance by aligning business objectives with societal needs and regulatory trends. Khan, Serafeim, and Yoon (2016) show that firms with strong performance on material sustainability issues generate superior risk-adjusted returns over time. These findings reinforce the idea that incorporating sustainability is not merely a matter of ethics, but a competitive advantage in a rapidly changing market environment.

Despite this, KPTL does not define itself as an impact manager but rather as an innovation platform that hosts impact products. In this context, the ability to demonstrate alignment between the impact thesis and financial returns has been

central to the investor relations strategy. ESG integration at KPTL is not limited to rhetoric but is expressed in strategic decisions regarding structuring, selection, and engagement with startups, consolidating a hybrid model that combines technological innovation with socio-environmental purpose.

2.2 KPTL's Ambitions with Sustainable Finance

KPTL's fund structure with a first-loss tranche reflects a concrete attempt to innovate in the way high-impact socio-environmental solutions are financed. The managers identified a structural gap in the Brazilian impact ecosystem: many promising startups, especially in the reforestation and bioeconomy sectors, face chronic difficulties in raising capital under conditions compatible with their operational risks and maturation timelines. By proposing a blended finance architecture—that is, the strategic combination of public, philanthropic, and private capital with risk mitigation instruments—KPTL sought to overcome this limitation.

KPTL's Forest & Climate Tech fund included a subordinated layer of risk capital (first-loss capital), initially envisioned to be raised from philanthropic and public-interest institutions, though this layer was ultimately not implemented. The structure aimed to reduce perceived risks for private investors by offering partial loss coverage in case of startup failure, consistent with a classic blended finance mechanism.

According to the managers, the goal was to attract significant contributions from institutional investors and family offices, with legal security and clarity about the role of each party in the fund's structure.

To position KPTL's experience within a broader global context, the table below presents a benchmark comparison of prominent blended finance initiatives. It includes both international-scale funds and KPTL's own models focused on the Amazon and Brazil.

Fund / Initiative	Region	Sector	Target Size (USD, mn)	Structure
SDG500	Global	Agriculture and SMEs	$500M	First-loss + LPs
Green Climate Fund (GCF)	Global South	Climate	$10B+	Grants + concessional

Fund / Initiative	Region	Sector	Target Size (USD, mn)	Structure
Amazon Regenerate Fund (KPTL)	Latin America	Bioeconomy	$30M	Blended (grant + equity)
Forest & Climate Tech (KPTL)	Latin America	Climate, Circular, ESG	$40–50M	Blended

TABLE 2: Benchmark Comparison of Blended Finance Funds.
SOURCE: Adapted from Convergence (2024).

While the Green Climate Fund and SDG500 operate at much larger scales, they share structural features with KPTL's funds, such as the use of concessional instruments (e.g., first-loss capital or grants) to unlock private investment. This reinforces the alignment of KPTL's blended strategy with globally recognized financing models in sustainable agriculture, climate mitigation, and bioeconomy.

KPTL expected to raise up to USD 40 million to invest in up to 30 startups in the sectors of climate, energy, sustainable agriculture, circular economy, forest restoration, carbon certification, and bioeconomy in the Amazon and other regions. The fund targeted a junior tranche of up to 25% composed of concessional capital. The estimated target return for the senior shares was approximately 30% of gross IRR. KPTL's proposal envisioned robust and transparent governance, with clearly defined impact metrics, multisectoral evaluation committees, and continuous monitoring mechanisms. This architecture was presented not only as a technical innovation but as a new model for building trust among public, private, and philanthropic actors.

However, these arrangements were hampered by a combination of technical and institutional barriers. Changes in the Federal government and shifts in the internal priorities of public institutions ended up delaying decisions and complicating firm commitments, frustrating traditional investors' expectations, affecting the fund-raising process. The general partners ended up launching a smaller fund, with four investors and one invested company (Ages Bioactive Compounds) for less than USD 1 million, lacking commercial scale. In this case, the announcement that a junior tranche would be structured led traditional investors to put their investment analysis on hold, and delays in the junior tranche eroded investor confidence (KPTL, 2023).

Although the Forest & Climate Tech fund did not reach its intended scale, its attempt to incorporate first-loss capital illustrates the strategic importance of such mechanisms in de-risking early-stage investments in underdeveloped sectors. According to the LSE Grantham Research Institute (2021), first-loss structures serve as essential tools to overcome coordination failures in climate finance, especially when public and private actors have misaligned incentives. Even unsuccessful pilots can generate critical institutional learning, paving the way for more robust blended finance models in future initiatives. Empirical analysis confirms that the presence of first-loss capital significantly increases the likelihood of private sector participation in sustainability-linked investment vehicles (Flammer et al., 2024).

In addition to the financial arrangement and the proposed governance, KPTL structured an Impact Committee with deliberative functions, responsible for validating the socio-environmental alignment of the invested companies, reinforcing the institutional solidity of the first-loss proposal. KPTL's Forest & Climate Tech was conceived as a catalytic platform aimed at transforming the impact ecosystem in Brazil. The strategy includes not only financing solutions but also training entrepreneurs, strengthening sustainable supply chains, and building open metrics that can serve as benchmarks for the sector.

3. KPTL's Big Challenges

3.1. Understanding first-loss capital is a common challenge

The term first-loss is one of the most commonly used mechanisms within blended finance structures. The logic is simple: use concessional capital (i.e., with higher risk tolerance or below-market return expectations) to reduce entry barriers and increase attractiveness for commercial investors. This approach is particularly useful in emerging markets and in sectors where risks are high and returns are more uncertain, such as reforestation or regenerative agriculture. By assuming the role of a risk cushion, this tranche offers greater security to senior investors. In KPTL's case, the strategy was to mobilize resources from public and philanthropic actors as a subordinated layer, creating a hybrid fund in which private investors would enter with more protected capital, reducing their exposure in the event of failure of the invested startups. The expectation, according to the managers, was that this first-loss capital would serve as a "trust anchor," facilitating the entry of

family offices and institutional investors who would otherwise be reluctant to take early-stage risks.

KPTL's financing model for the Forest & Climate Tech fund includes a tiered return distribution mechanism designed to enhance investor confidence and attract commercial capital. Known as "waterfall logic," this structure determines the order in which different financial instruments are repaid, starting with equity, followed by subordinated credit, and finally allocating any remaining returns as upside.

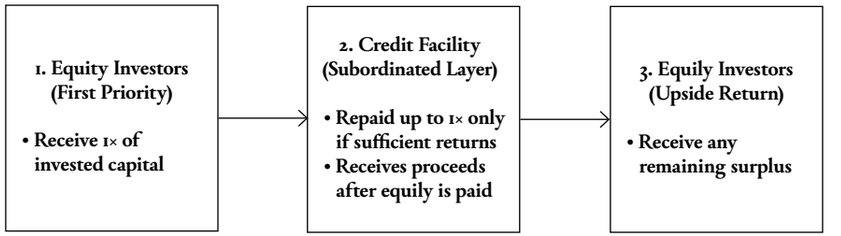


FIGURE 2: Waterfall Logic of Return Distribution in KPTL's Forest & Climate Tech Fund.
SOURCE: Adapted from "KPTL Nature & Climate Funds" (2024).

This hierarchy ensures that equity investors recover their initial capital (1x) before any repayment is made to the credit facility. Only if the equity layer is fully repaid will the subordinated credit receive up to 1x, and any remaining surplus is distributed as an additional return to equity investors. This sequencing reduces the downside risk for commercial participants and makes the fund more attractive to private investors with standard return expectations.

In addition to first-loss capital, blended finance structures may include instruments such as:

- Partial credit guarantees, as offered by multilateral institutions, such as USAID or KfW;
- Currency hedges to attract foreign capital to local projects;
- Climate or sectoral insurance, common in agriculture and infrastructure;
- Public co-financing mechanisms, such as minority participation with lower return requirements;
- Technical assistance grants that help companies prepare for investment.

The most common instruments in blended finance structures include guarantees (present in 63% of the globally mobilized volume), first-loss capital (used in 35% of environmental funds), and co-financing with senior debt and equity. In Brazil, development banks such as BNDES have supported blended structures by offering non-reimbursable resources in subordinated positions to help de-risk private investment, particularly in environmental and climate-related projects (Convergence, 2024; BNDES, 2023). The combination of these instruments is expected to allow first-loss models to scale efficiently, attracting commercial investors to traditionally underserved sectors. However, KPTL's experience shows that even well-designed structures can face significant execution barriers.

Academic research underscores that first-loss capital improves the perceived risk-return profile for commercial investors, particularly when embedded in transparent governance and rigorous impact measurement frameworks. Christiansen (2021) emphasizes that blended finance structures only succeed when de-risking instruments such as first-loss are backed by institutional credibility and clearly articulated objectives. Escobar-Anel, Havrylenko, and Zagst (2023) develop a model of hedge funds using first-loss compensation schemes, showing how these mechanisms can optimize the Sharpe ratio by aligning incentives between fund managers and investors. Additionally, the Climate Policy Initiative (2013) highlights that first-loss protection can play a critical role in closing risk gaps and improving the credit profile of green investments, thereby unlocking private capital for high-impact sectors that remain underserved by traditional finance.

3.2. Lesson learned on missed timing, legal structure and engagement with investors

The general partners presented investors with a thesis aligned with the principles of financial return with measurable socio-environmental impact, structured around robust governance, thematic selection focused on regenerative solutions, and well-defined performance metrics. At the core of the proposal was the use of the first-loss capital mechanism, with the expectation that institutions would assume a subordinated position in the fund. This model would allow for the reduction of capital costs for early-stage companies, whose revenue generation capacity is still uncertain but whose potential impact is significant. The fundraising proposal was thus based on a balance between technical innovation, commitment to impact, and mitigation of financial risks.

However, the implementation of the structure faced significant obstacles. Despite advanced discussions, candidates for the subordinated tranche did not close. In some

cases, such as with public institutions, changes in political priorities and administrative transitions led to postponements or shifts in engagement As for Fundo Vale, technical and legal barriers associated with the investment structure originally proposed by KPTL made its allocation as first-loss unfeasible. By anchoring the fundraising efforts in the presence of a junior tranche without firm guarantees, expectations were created that, once frustrated, delayed negotiations with senior holders. This underscores the need to structure de-risking instruments before the fundraising round, ensuring predictability and integrity in the proposed financial engineering.

> "We learned the hard way that no structure survives without timing. You can't anchor fundraising on something that's not confirmed."
> Danilo Zelinski

To contextualize the scale and evolution of blended finance globally, Figure 4 illustrates the volume of capital mobilized, the number of blended transactions executed annually, and the estimated level of aggregated financing between 2010 and 2020. The number displayed above each bar corresponds to the number of blended finance projects structured in that year. The data reveal a consistent upward trend in both volume and project count, culminating in a record USD 11 billion in 2020, with over 50 structured deals.

Global Blended Finance Trends (2010-2020)

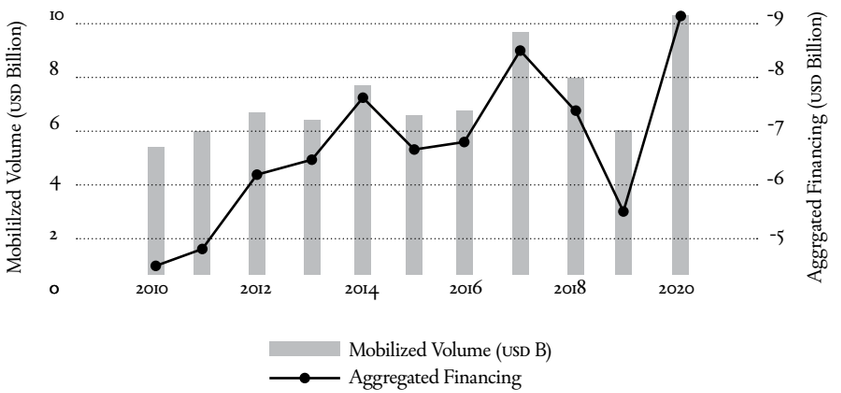


FIGURE 3: Global Blended Finance Trends (2010–2020): Volume, Aggregated Financing, and Number of Transactions.
SOURCE: Adapted from Convergence Finance data as reproduced in MIT Sloan Review Brasil (2024).

The trajectory of blended finance activity underscores its growing role in global development finance. According to Convergence Finance, the total mobilized volume has steadily increased over the past decade, with significant spikes in 2017 and 2020. Simultaneously, the number of transactions nearly doubled, signaling a broader institutional uptake of blended finance structures. Aggregated financing estimates further suggest that public and concessional capital continues to play a catalytic role in scaling private sector participation.

In the Brazilian context, the Aspen Network of Development Entrepreneurs (ANDE) reported that the volume of impact investments under management reached BRL 18.7 billion in 2021, reflecting a 60% growth compared to the previous year. This expansion highlights the increasing relevance of impact-driven capital in the region. Although not all of this volume is exclusively linked to blended finance structures, recent research indicates that 34% of impact investors in Brazil already employ blended finance mechanisms. This demonstrates the growing acceptance of hybrid financial instruments as a means to de-risk investments and attract private capital into sectors with high social and environmental impact.

In parallel, KPTL began exploring legal structures compatible with philanthropic capital. It is currently negotiating with Fundo Vale and IDB to enable a new first-loss strategy through a debt structure granted via a non-profit entity. This innovative structure, which lies between a donation and commercial debt, is designed to mitigate risks and enhance the entry of concessional capital more tangibly and efficiently. By leveraging philanthropic capital as a first-loss buffer, this approach aims to unlock further private sector investment in sustainable projects that traditionally carry higher perceived risks.

This alignment between global blended finance trends and localized initiatives in Brazil reflects a broader shift towards sustainable financing mechanisms capable of scaling impact at both national and international levels.75% of blended finance transactions are concentrated in low- and middle-income countries. Latin America accounts for 27% of these operations, with Brazil being one of the ten largest recipients of mobilized private capital. The average leverage rate in the region is 1:4.7, higher than in other regions (Convergence, 2024).

3.3. Impact Monitoring is core to the investment thesis

KPTL adopts a structured approach to monitor the impact of its investees, combining international guidelines with internal tools adapted to the reality of Brazilian venture capital. The conceptual foundation follows the principles of the Impact Management Project (IMP), particularly concerning the role of the manager as a

contributing agent for impact and not merely a passive financier. Additionally, KPTL developed a proprietary scorecard that gathers quantitative and qualitative metrics to assess the socio-environmental performance of the portfolio companies. This internal tool considers aspects such as alignment with the impact thesis, additionality, and operational ESG risks—although the term "ESG" has gradually been replaced by a narrative centered on "impact" as an added value to the investment thesis.

Despite the effort reported by KPTL specialists in building a robust methodology, the practical application of monitoring still faces significant barriers. The planned measurement frequency is monthly and monitoring is being rolled out across all funds gradually. The main challenge lies in the technical limitations of the invested startups, which often lack structure, personnel, or systems to collect and report reliable impact data. As Isadora Barbosa emphasized,

> "Many of the startups simply didn't have the structure to collect the data we needed, and some didn't even understand why it mattered." Isadora Barbosa

This creates a gap between the institutional discourse of the manager, which seeks transparency and evidence of results, and the concrete operational limitations of early-stage startups.

To further qualify this process, KPTL internally adopts a methodological combination of the "Impact Lens," which provides a qualitative and contextual view of impact, along with the "Impact Pulse," which seeks to measure intentionality and materiality in a structured way.

As noted by Brest and Born (2013), effective impact measurement in venture capital is inherently constrained by the early developmental stage of most investees, making the design of rigid evaluation systems counterproductive. They argue that the balance between evidence and flexibility is essential to avoid compromising either entrepreneurial focus or the integrity of impact claims. Similarly, Bouri and Emerson (2016) emphasize that excessive demands for quantification can create a disconnect between investors' expectations and entrepreneurs' operational realities, particularly in low-capacity environments. Glänzel and Scheuerle (2016) also warn that rigid impact frameworks may incentivize performative reporting and undermine the developmental trajectory of early-stage ventures.

The literature on impact investing corroborates this challenge. Venture capital in emerging markets deals with early-stage companies with limited analytical capacity and a primary focus on survival and growth. Studies indicate that the demand for detailed impact metrics can, paradoxically, create an overload for entrepreneurs and distort the data reported (Jackson, 2013; Dumont et al. 2014; Addy et al., 2020). There

is, therefore, an inevitable tension between the ambition for methodological rigor and the practical feasibility of measurement. In response to this, some managers have adopted more iterative and formative approaches, prioritizing continuous dialogue with entrepreneurs and the gradual evolution of indicators, rather than rigid and standardized requirements from the outset of the operation. Research suggests that market reacts negatively to companies that treat ESG criteria merely as reputational signaling, without concrete evidence of integration into business practices (Serafeim and Yoon, 2022).

In KPTL's case, the challenge is not only technical but also strategic: ensuring that the impact narrative is not reduced to mere marketing rhetoric but is supported by evidence and a systematic monitoring process, even if adapted to the reality of early-stage companies. KPTL sees as essential to reinforce technical assistance for investees, either in house or via specialized consultancies, create incentive mechanisms for data collection, and perhaps, in certain cases, relax the level of reporting requirements without compromising the integrity of the theory of change. This view aligns with findings by Rouen, Serafeim, and Wang (2021), who demonstrate that firms with superficial ESG disclosures tend to experience negative market responses, especially when such disclosures are not backed by verifiable operational changes.

In addition to the approach based on the principles of the Impact Management Project (IMP) and its proprietary scorecard, KPTL adopts a structured ESG assessment methodology represented in a matrix format, developed with the technical support of the consultancy Resultante (now part of KPMG Brazil), with the leadership of its founder and CEO, Maria Eugênia Buosi. This matrix crosses two dimensions: on the vertical axis (processes), it assesses the degree of ESG agenda integration into the company's management and operational practices; on the horizontal axis (nature of the business), it measures the potential positive impact of the products and services offered.

Each invested company receives a score ranging from 0% to 100%, divided into three categories: unsatisfactory performance, moderate performance, or good practices.

This score is the result of a detailed checklist with over 30 topics distributed among the environmental, social and governance pillars, weighted according to sectoral materiality. Additionally, the methodology consider negative contributions to the rating, such as environmental non-compliance, social controversies, or governance failures that occurred in the last three years. The model integrates indicators linked to the IRIS+ list (GIIN) and the Sustainable Development Goals (SDGs), enabling an additional evaluation of the socio-environmental impact nature of the companies. The classification varies according to the representativeness of these activities in the revenue and

the number of SDG goals with which the company's products or services clearly relate.

Below is a summary of the main themes and indicators used in the evaluation matrix:

Dimension	Evaluation Theme	Indicator Examples
Environmental	Eco-efficiency and Waste Management	Monitoring of resource consumption, solid waste management
—	Climate Change	Emissions inventory, climate mitigation and adaptation strategies
—	Environmental Non-compliance	Notices, fines, or environmental lawsuits
Social	Employee Relations	Climate surveys, diversity programs, health and well-being
—	Customer Relations	Customer satisfaction, information security, certifications (e.g., ISO 45001)
—	Supplier Management	Social and environmental clauses in contracts, supply chain risk assessment
—	Stakeholder Scandals	Cases of child labor, harassment, labor lawsuits
Governance	Integration into Strategy and Transparency	Adoption of SDGs, public ESG policies, sustainability reports
—	Integrity	Code of ethics, whistleblowing channels, integrity and compliance committees
—	Governance Scandals	Convictions for corruption, public civil actions, administrative misconduct

Dimension	Evaluation Theme	Indicator Examples
Transversal	Nature of the Business and Additionality	Revenue share in activities with significant positive impact according to IRIS+

TABLE 3: Matrix of Impact Themes and Indicators (KPTL)
SOURCE: Prepared by the Authors (2025).

This information feeds into a scorecard system, which generates visual diagnostics and allows KPTL to quickly identify performance gaps. These gaps serve as the basis for planning engagement actions with portfolio companies, frequently discussed in board meetings. The requirement for documentary evidence for each item analyzed aims to ensure the integrity of the process and reinforce investor confidence in the impact metrics reported by the manager.

KPTL's commitment to impact measurement, even when facing structural constraints, illustrates the critical role of disciplined monitoring in building credible and scalable sustainable finance platforms in emerging markets.

4. Scaling a Startup in reforestation

4.1 Reforestation at scale: costs and operational challenges

Latin America concentrates nearly half of the world's blended finance transactions, focusing on solar energy, sustainable agriculture, and bioeconomy. In Brazil, 11 blended finance funds were structured through BNDES between 2022 and 2024, mobilizing around USD 180 million in private capital. A milestone is the BNDES-managed Amazon Fund, which has already mobilized USD 1.3 billion through donations and public guarantees since its launch in 2008 (IDB Lab, 2024; Convergence, 2024).

KPTL adopts an investment approach that prioritizes the autonomy of startups, avoiding the assumption of majority equity control. The general partner maintains minority stakes, usually around 20%, regardless of the socio-environmental impact level of the investees. This strategy aims to preserve the operational independence of the companies, allowing entrepreneurs to maintain leadership

and organizational culture, while KPTL provides strategic support and access to networks, and leave space for future rounds of fundraising.

The company assessment methodology is represented by a matrix that combines two main axes: management capacity (Y-axis) and the potential environmental and climate impact, based on the sector of activity (X-axis). The vertical axis reflects the degree of maturity of a company in adopting ESG practices across its internal processes, policies, and stakeholder engagement, as illustrated in the figure below. This evaluation is conducted through a structured analysis of 35 indicators, organized under the pillars of Environmental (20%), Social (40%), and Governance (40%), using a checklist applied by specialized analysts. Each company's performance is translated into a percentage score, which allows its classification into three levels: Unsatisfactory (0–35%), Moderate (35.01%–50%), and Good Practices (above 50.01%). These classifications serve as the basis for strategic recommendations and structured discussions in boards and committees, fostering continuous improvement.

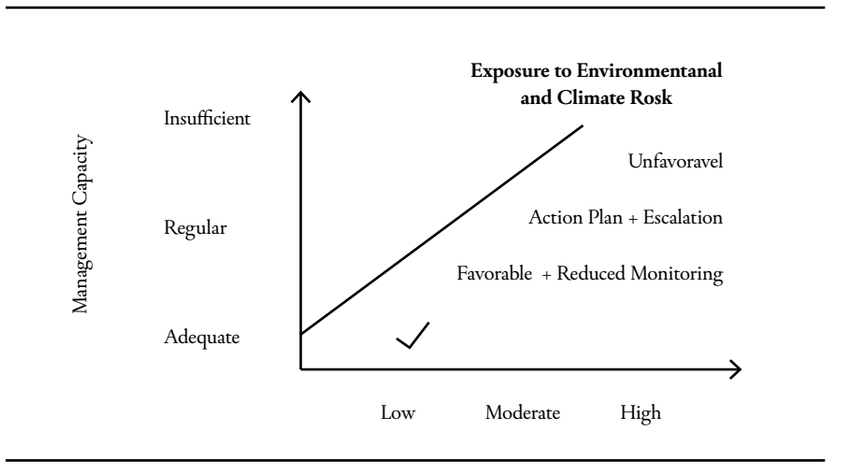


FIGURE 5: KPTL Methodology: ESG Assessment Framework for Portfolio Companies
SOURCE: KPTL (2024).

The horizontal axis reflects the nature of the sector in which the company operates and is classified according to its potential environmental and climate risk, based on

the International Finance Corporation (IFC, 2025) risk categorization framework. Low-impact sectors are those associated with minimal or no risk; moderate-impact sectors involve localized, reversible, and readily mitigable risks; while high-impact sectors are characterized by diverse, adverse, irreversible, or unprecedented risks. The intersection of both axes generates four risk exposure zones: (i) Favorable, when there is low exposure and high management capacity; (ii) Favorable with reduced monitoring, for intermediate scenarios; (iii) Requires an action plan and escalation, when risk levels are elevated; and (iv) Unfavorable, when high exposure is combined with insufficient management capacity, warranting restrictions or ineligibility. This matrix, therefore, provides an integrated view of sectoral risk and corporate maturity, serving as a strategic tool for prioritization and risk mitigation within the context of sustainable investment.

In the context of impact monitoring, KPTL faces the challenge of balancing the need to track the socio-environmental results of its investees with the management of a diversified portfolio. Detailed monitoring requires time and technical expertise, which can pose a barrier to the scalability of the model. To mitigate this challenge, KPTL has invested in tools and methodologies that allow for systematic and adapted monitoring for early-stage startups without compromising their operational autonomy. This methodology is based on an ESG matrix that integrates two dimensions:

1. Management practices in environmental, social, and governance topics;
2. The nature of the business and its positive impact.
3. The objective is to integrate ESG management capacity with the company's direct contribution to strategic socio-environmental agendas.

Although standardized, the application of the methodology is investigative and collaborative. It incorporates documentary evidence, interviews with founders, and external research. This approach enables KPTL to identify governance or impact gaps and engage startups in continuous improvement plans. The model requires time, frequent contacts, and qualified personnel, which limits its scalability.

Despite these constraints, KPTL stands out as one of the few venture capital firms in Latin America actively developing scalable models for sustainable land use and reforestation. Its pioneering funds, such as FIMA and Forest & Climate Tech, have helped structure the early ecosystem for impact-driven startups in bioeconomy, combining strategic capital with tailored governance and monitoring frameworks.

4.2 Implementing Blended Finance before Fundraising

From a performance management perspective, KPTL uses classic venture capital metrics such as MOIC (Multiple on Invested Capital), IRR (Internal Rate of Return), and NPV (Net Present Value). These financial metrics are analyzed alongside qualitative criteria related to the startup's purpose and impact. The assessment of success is adapted on a case-by-case basis, considering both financial performance and the degree of alignment with the proposed impact thesis at the time of investment. This flexible approach is compatible with the early stage of the investees but also reinforces the importance of having robust support structures—such as consultancies, intermediary indicators, and external validations—to prevent the impact narrative from becoming overly subjective or inconsistent over time.

The adoption of this detailed ESG evaluation methodology by investees, although positive for the integrity of the impact thesis, imposes operational challenges that add to the barriers already faced in structuring the first-loss. The system requires startups to provide data and evidence about their practices across various dimensions, including efficiency, diversity, corporate integrity, and stakeholder relations. This level of rigor increases the operational cost of the fund and demands greater technical preparedness from the investees. Consequently, the need to secure de-risking instruments ex-ante, such as subsidized technical support or public financing for structuring, becomes even more critical. The complexity of the investment thesis makes purely private fundraising at early stages less viable.

By altering the expected risk-return relationship, these structures enable investments in businesses that, on their own, would be outside the conventional efficient frontier—especially in sectors like green infrastructure, bioeconomy, and reforestation. One of the main lessons learned by the manager was the necessity of having a minimum volume of committed capital before structuring the fund, as small-scale vehicles become economically unviable and unattractive to new investors.

Anchored structures can attract private capital to high-risk sectors. The Althelia Climate Fund, launched in 2013, invested in sustainable land-use practices, mitigating the main drivers of deforestation and reducing carbon emissions. With a portfolio of 10 projects, the fund avoided 101,300 hectares of deforestation and 41.8 million tons of CO_2, protecting 2 million hectares of critical habitats. Its model utilized environmental assets, such as carbon credits, as guarantees to attract private investors (First-loss Earth, 2020). Unlike these more established vehicles, KPTL's approach reflects the challenges of pioneering blended structures in early-stage venture capital—an area still underdeveloped in most emerging markets.

Another example is the &Green Fund, launched in 2017, which aims to decouple supply chains from deforestation, helping companies in tropical regions transform

their business models to become commercially viable and sustainable. With a goal to mobilize USD 2 billion, the fund has already received significant contributions from entities like NICFI, Unilever, and GEF, providing long-term loans and guarantees to companies adopting sustainable agricultural practices (Green Finance Institute, 2023).

In 2025, oil company Petrobras and impact fund Régia Capital announced the creation of a USD 20 million fund to finance bioeconomy projects in the Amazon. The fund seeks to support initiatives that promote the sustainable development of the region, focusing on natural solutions and technological innovation.

These examples, while demonstrating the potential of hybrid finance, also reinforce the challenge of replicating this success in markets like Brazil, where institutional stability and prior engagement of partners are still rare prerequisites. Achieving scale requires not only technical innovation but also solid institutional arrangements and predictable political commitments—prerequisites that remain fragile in emerging economies like Brazil (Bhattacharya et al., 2023). The example of KPTL emphasizes the importance of combining financial innovation with a realistic strategy for fundraising, governance, and building trust with investors.

Such early initiatives, even when constrained by scale or timing, contribute to market learning and institutional maturity, paving the way for more effective blended finance mechanisms in the future. As noted by Pierri and Timmer (2023), scaling blended finance models in emerging economies often fails not due to financial design flaws, but because of weak institutional ecosystems and short investment timeframes that are incompatible with the nature of impact-oriented ventures.

5. Conclusion

KPTL structured a venture capital fund strategy with explicit first-loss elements, focused on bioeconomy and sustainability. KPTL has managed to achieve impact by launching and implementing a fund that incorporated ESG methodologies and supported start-ups aligned with sustainability goals. However, the fundraising journey was complex. Yet, the experience contributed to institutional learning and opened paths for improving future blended finance initiatives in the region.

Behind the guidelines and frameworks, real dilemmas exist: the absence of well-defined de-risking mechanisms, gaps in impact measurement, mismatches between institutional narrative and execution, and political and technical barriers that prevent the full adoption of models such as first-loss.

KPTL's case illustrates how vision, strategic choices, capital structure, and operational challenges intersect in practice. The case offers important lessons about the real constraints faced by organizations in implementing blended finance instruments in Brazil. Two recommendations stand out. First, KPTL noted the need to structure risk mitigation mechanisms—such as guarantees, subsidies, and anchor contracts—before the start of commercial fundraising. Second, the fund managers highlight the importance to rethink the balance between impact depth and financial return, especially in sectors that involve multiple dimensions, such as the bioeconomy.

Blended finance continues to offer strong potential for mobilizing capital toward sustainability goals, but its success depends not only on innovative structuring, but also on the alignment of incentives, proper timing, and mutual trust among all stakeholders.

References

1. ALBUQUERQUE, R.; KOSKAS, D.; YU, J. *Corporate Social Responsibility and Firm Risk: Theory and Empirical Evidence*. Management Science, 2020.
2. ASPEN NETWORK OF DEVELOPMENT ENTREPRENEURS – accessed on May 18, 2025:
3. AMIGHINI, A.; GIUDICI, P.; RUET, J. *Finanças verdes: Uma análise empírica da estrutura de portfólio do Fundo Verde para o Clima*. Journal of Cleaner Production, v. 350, p. 131383, 2022.
4. BANCO NACIONAL DE DESENVOLVIMENTO ECONÔMICO E SOCIAL (BNDES). *Blended Finance – Chamada Pública 2022*. Rio de Janeiro, 2023. accessed on May 2, 2025: https://www.bndes.gov.br.
5. BANCO NACIONAL DE DESENVOLVIMENTO ECONÔMICO E SOCIAL (BNDES). *First-loss*. Rio de Janeiro, 2022. Accessed on May 2, 2025: https://www.bndes.gov.br/wps/portal/site/home/desenvolvimento-sustentavel/parcerias/blended-finance.
6. BHATTACHARYA, A.; SONGWE, V.; SOUBEYRAN, E.; STERN, N. *Uma estrutura de financiamento climático: ação decisiva para cumprir o Acordo de Paris – Resumo*. Segundo relatório do Grupo Independente de Peritos de Alto Nível sobre Financiamento Climático. Londres: Grantham Research Institute on Climate Change and the Environment, London School of Economics and Political Science, 2023.
7. BREST, P.; BORN, K. *Unpacking the impact in impact investing*. Stanford Social Innovation Review, 2013.
8. CLIMATE POLICY INITIATIVE (CPI). *Global Landscape of Climate Finance 2023*. San Francisco: CPI, 2024. accessed on May 15, 2025:: https://www.climatepolicyinitiative.org.
9. CONVERGENCE. *The state of first-loss 2024*. Toronto: Convergence First-loss, 2024. accessed on May 3, 2025:https://www.convergence.finance/resource/state-of-blended-finance-2024/view.
10. CHRISTIANSEN, J. *Fixing fictions through blended finance: The entrepreneurial ensemble and risk interpretation in the Blue Economy*. *Geoforum*, v. 120, p. 93–102, 2021.
11. DESCHRYVER, P.; DE MARIZ, F. The role of transition finance instruments in bridging the climate finance gap. In: HEBB, T.; JACKSON, E.; TUAN, M. (ed.). *The global handbook of impact investing*. London: Routledge, 2020.
12. Dumont, Katia and Edens, Genevieve and de Mariz, Frederic and Rocha, Rebeca and Roman, Eduardo and Rossi, Alberto and Valencia, Natalia, The Impact Investing Landscape in Latin America, Trends 2014-2015 (August 30, 2016).

13. FIRST-LOSS EARTH. *Althelia Climate Fund*. 2020. accessed on May 3, 2025: https://www.blendedfinance.earth/blended-finance-funds/2020/11/16/althelia-climate-fund-1.
14. FLAMMER, C. *Corporate Green Bonds*. Journal of Financial Economics, 2021.
15. FLAMMER, C.; GIROUX, T.; HEAL, G. *Blended finance*. Cambridge, MA: National Bureau of Economic Research, 2024. (NBER Working Paper No. 32287).
16. FLAMMER, C.; GIROUX, T.; HEAL, G. M. *Finanças da biodiversidade*. *Journal of Financial Economics*, v. 164, 103987, 2025.
17. FRIEDE, G.; BUSCH, T.; BASSEN, A. *ESG and financial performance: aggregated evidence from more than 2000 empirical studies*. Journal of Sustainable Finance & Investment, 2015.
18. FUNDO VALE. *KPTL and Fundo Vale structure Forest and Climate Fund to invest R$200 million in impact companies in the bioeconomy*. 2023. Accessed on May 1, 2025:
19. https://www.fundovale.org/.
20. GIIN – GLOBAL IMPACT INVESTING NETWORK. *Risk, return, and impact: exploring diverse perspectives*. 2017. Accessed on May 3, 2025:
21. : https://thegiin.org/assets/2017_GIIN_RiskReturnImpact.pdf.
22. GREEN FINANCE INSTITUTE. *&Green Fund: case study*. 2023. Accessed on May 3, 2025:https://hive.greenfinanceinstitute.com/gfihive/revenues-for-nature/case-studies/green-fund.
23. HASSAN, M. K.; IRSYAN, N. M.; MUNEEZA, A. I. S. H. A. T. H. *The potential of Waqf-Blended finance using crowdfunding in Indonesia*. *International Journal of Islamic Thought*, v. 24, p. 72–99, 2023.
24. HAVEMANN, T.; NEGRA, C.; WERNECK, F. *Financiamento combinado para a agricultura: explorando as restrições e possibilidades da combinação de instrumentos financeiros para transições sustentáveis*. In: INOVAÇÃO social e transição para a sustentabilidade. Cham: Springer Nature Suíça, 2022. p. 347–358.
25. IDB LAB. *Unlocking Private Capital for the Amazon*. Washington, D.C.: Inter-American Development Bank Lab, 2024. Accessed on May 10, 2025:: https://www.idblab.org.
26. JACKSON, E. T.; HARJI, K. *Accelerating impact: achievements, challenges and what's next in building the impact investing industry*. New York: Rockefeller Foundation, 2013.
27. KHAN, M.; SERAFEIM, G.; YOON, A. *Corporate Sustainability: First Evidence on Materiality*. The Accounting Review, 2016.
28. KPTL. *The Call of the Wild*. 2023. Accessed on May 14, 2025:: https://kptl.com.br/the-call-of-the-wild/?lang=en.
29. KPTL. *Site institucional*. 2025. Accessed on May 1, 2025:: https://kptl.com.br. Acesso em: 1 maio 2025.
30. LSE GRANTHAM RESEARCH INSTITUTE. *First-loss for scaling up climate and nature investments*. London School of Economics, 2021. Accessed on May 3, 2025:https://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2021/11/Blended-Finance-for-Scaling-Up-Climate-and-Nature-Investments-1.pdf.
31. NGFS – NETWORK FOR GREENING THE FINANCIAL SYSTEM. *Scaling up Blended Finance for Climate and Development*. Paris, 2023. Accessed on May 10, 2025:: https://www.ngfs.net.
32. OECD/UNCDF (2020). *Blended Finance in the Least Developed Countries 2020: Supporting a Resilient COVID-19 Recovery*. OECD Publishing, Paris. Accessed on May 3, 2025:: https://www.oecd.org/en/publications/blended-finance-in-the-least-developed-countries_57620d04-en.html
33. OECD – ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT. *Making first-loss work for the Sustainable Development Goals*. Paris: OECD Publishing, 2018. Accessed on May 3, 2025: https://www.oecd.org/publications/making-blended-finance-work-for-the-sustainable-development-goals-9789264288768-en.htm.
34. ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT (OECD). *The OECD DAC first-loss guidance*. Paris: OECD Publishing, 2021. Accessed on May 3, 2025:
35. https://www.oecd.org/content/dam/oecd/en/publications/reports/2021/05/the-oecd-dac-blended-finance-guidance_42663a16/ded656b4-en.pdf.
36. PIERRI, N.; TIMMER, Y. *Capital Flows and the Institutional Foundations of Blended Finance*. *World Bank Policy Research Working Paper*, 2023.

37. PRASAD, M. A.; LOUKOIANOVA, M. E.; FENG, A. X.; OMAN, W. *Mobilizando financiamento climático privado em economias de mercados emergentes e em desenvolvimento*. Fundo Monetário Internacional, 2022.
38. RAGHUNANDAN, A.; RAJGOPAL, S. *Do ESG funds make stakeholder-friendly investments?*. Review of Accounting Studies, 2022.
39. RESET. *Petrobras e Régia já preparam aportes de novo fundo de R$ 100 mi para bioeconomia*. 2025. Accessed on May 3, 2025: https://capitalreset.uol.com.br/financas/petrobras-e-regia-ja-preparam-aportes-de-novo-fundo-de-r-100-mi-para-bioeconomia.
40. ROUEN, E.; SERAFEIM, G.; WANG, C. S. *Restructuring ESG disclosures for capital markets*. Journal of Accounting and Economics, 2021.
41. SERAFEIM, G.; YOON, A. *A quais notícias corporativas de ESG o mercado reage?*. *Financial Analysts Journal*, v. 78, n. 1, p. 59–78, 2022.
42. UNITED NATIONS ENVIRONMENT PROGRAMME FINANCE INITIATIVE (UNEP FI). *Scaling first-loss*. Genebra: UNEP FI, 2021. Accessed on May 3, 2025:: https://www.unepfi.org/wordpress/wp-content/uploads/2021/12/NZAOA_Scaling-Blended-Finance.pdf.
43. UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP). *State of Finance for Nature 2023: Time to Act*. Nairobi: UNEP, 2024. Accessed on May 15, 2025:https://www.unep.org.
44. WORLD RESOURCES INSTITUTE (WRI). *Unlocking Finance for Nature-Based Solutions in the Amazon Basin*. Washington, D.C.: WRI, 2023. Accessed on May 2, 2025: https://www.wri.org

Mirova Lessons learned from the Land Degradation Neutrality (LDN) fund's investments in Latin America

Mirova Research Center[1]

1. This document is produced by the Mirova Research Center (MRC) in the framework of the partnership between the MRC and Columbia. This document is not a promotional communication and is not intended to promote the fund(s) mentioned. Therefore this document does not constitute an offer or any other kind of invitation to buy any share of the funds mentioned in any jurisdiction.

Abstract

Mirova's Land Degradation Neutrality (LDN)[2] Fund serves as an insightful case study on the effectiveness of blended finance in mobilizing private capital for sustainable land management (SLM) in emerging markets. Launched in 2017 and managing $208 million in assets, the LDN Fund invests in commercially viable projects across planted forests, agroforestry, and agro-ecological transitions in Africa, Latin America, and Asia through long-term debt and equity. Its layered capital structure enables junior investors – such as governments, development agencies and foundations focused on impact – to provide concessional capital that plays a catalytic role in attracting senior investors seeking market-rate returns with lower risk. This approach allows the fund to unlock capital for projects with positive impacts that may otherwise struggle to secure funding under typical market conditions. Through its 13 projects, the LDN Fund addresses key Sustainable Development Goals (SDGs) related to poverty, hunger, climate action, gender equality, and life on land, among others.

Drawing on Mirova's experience with the LDN Fund, this case study highlights critical lessons learned and provides best-practice recommendations. These include the importance of effectively designing the fund structure and clearly communicating the risk mitigation benefits to senior investors. Mirova's teams also emphasize the significance of establishing relevant impact objectives and developing a rigorous narrative around the fund's financial and developmental additionality to ensure that positive impact goals are met. Furthermore, they underline the importance of utilizing a variety of long-term financing instruments including equity, debt, and self-liquidating instruments, as well as providing investees with access to a Technical Assistance Facility, both of which are crucial for achieving impact and building a successful investment pipeline across various market environments. As the fund transitions from its investment phase to its management phase, valuable insights can be gained regarding the complexities of investing in emerging markets, particularly in innovative business models where addressing market failures poses significant challenges. Finally, the case study includes a section that

2. Land Degradation Neutrality (LDN) Fund is a Luxemburg Special Limited Partnership (Société en Commandite Spéciale), closed to new subscription. Mirova is the management company. The supervisory authority approval is not required for this fund.

provides in-depth examples of three investments made in Latin America, highlighting different countries and unique business models. Ultimately, these best practices and project examples aim to inform and facilitate the scaling of blended finance initiatives, especially in the Global South.

Introduction – Biodiversity Finance in Latin America

Addressing land degradation and nature collapse

Land degradation is a critical global issue that adversely affects food security, water availability, and ecosystem health. The United Nations Convention to Combat Desertification (UNCCD) estimates that up to 40% of the planet's land is degraded, a figure that could rise to 95% by 2050 under a business-as-usual scenario. This collapse of natural systems has severe implications for Latin America, where 22% of land is already degraded, primarily due to human activities like agriculture[3]. These practices lead to soil erosion at rates significantly faster than natural replenishment, resulting in an average loss of 3 million hectares of natural land each year between 2001 and 2012[4].

The economic impact is substantial; for instance, the cost of land degradation accounted for 26% of Argentina's GDP in 2017. Additionally, degraded lands contribute significantly to climate change, with global emissions from such areas reaching up to 4.4 billion tons between 2000 and 2009[5]. In Latin America, the degradation of vital ecosystems, including 26% of the world's mangrove forests, threatens their capacity to store carbon. This degradation exacerbates poverty, conflict, and migration within the region, underscoring the urgent need for sustainable land management (SLM) practices to address these pressing environmental and social challenges.

Supporting sustainable land management practices can yield significant environmental and socio-economic benefits by enhancing land productivity while preserving ecological functions. Integrating strategies such as reforestation and landscape restoration can help achieve land degradation neutrality (LDN), ensuring

3. https://www.unccd.int/land-and-life/land-degradation-neutrality/overview
4. https://www.unccd.int/sites/default/files/2022-04/GLO%20LAC%20ENGLISH_WEB.pdf
5. https://www.un.org/en/climatechange/science/climate-issues/land

the stability and improvement of land resources essential for ecosystem services and food security.

Scaling financing toward land degradation neutrality – the role of blended finance

To meet recent international commitments like the Global Biodiversity Framework's goal of conserving 30% of land and sea by 2030, funding for nature-based solutions (NBS) must increase from $200 billion to $737 billion by 2050[6]. Unfortunately, current investment in SLM ranges from $1.3 billion to $51.8 billion[7], with only about 18% coming from private capital, falling short of this urgent need. Even the largest-scale projects, such as Initiative 20x20 which mobilized $2.4 billion in private investment over six years to restore 50 million hectares of degraded land in Latin America and the Caribbean[8] are far from reaching the necessary scale.

Like many contemporary societal challenges, public and philanthropic funding alone is insufficient to bridge the biodiversity and sustainable land use financing gap; significant private investment is essential. However, barriers such as unclear returns on investment, long investment horizons, limited liquidity, and difficulties in monitoring results hinder private sector participation. Additionally, a lack of knowledge about sustainable land management (SLM) and various perceived risks in emerging markets increase the overall risk profile of these investments. To address these challenges, new mechanisms are needed to effectively leverage private investments in sustainable land management initiatives.

Blended finance is emerging as a promising approach to achieve this by utilizing catalytic capital from public or philanthropic sources to attract private sector investment in sustainable development. This concessional capital, which provides more favorable financial terms such as lower interest rates, extended repayment periods, and financial guarantees among others, helps mitigate financial risks in sectors like renewable energy and sustainable agriculture in emerging markets. Figure 1 illustrates this mechanism. By improving the risk-reward profile of high-impact projects, blended finance can attract private investments that might otherwise be deemed too risky or unviable, thereby unlocking crucial

6. https://www.unep.org/resources/state-finance-nature-2023
7. https://www.convergence.finance/resource/financing-sustainable-land-use:-unlocking-business-opportunities-in-sustainable-land-use-with-blended-finance/view
8. https://www.unccd.int/sites/default/files/2022-04/GLO%20LAC%20ENGLISH_WEB.pdf

funding in overlooked areas. To date, blended finance has mobilized approximately $231 billion in capital towards sustainable development in emerging countries[9] with Latin American accounting for $19.7 billion of that total.

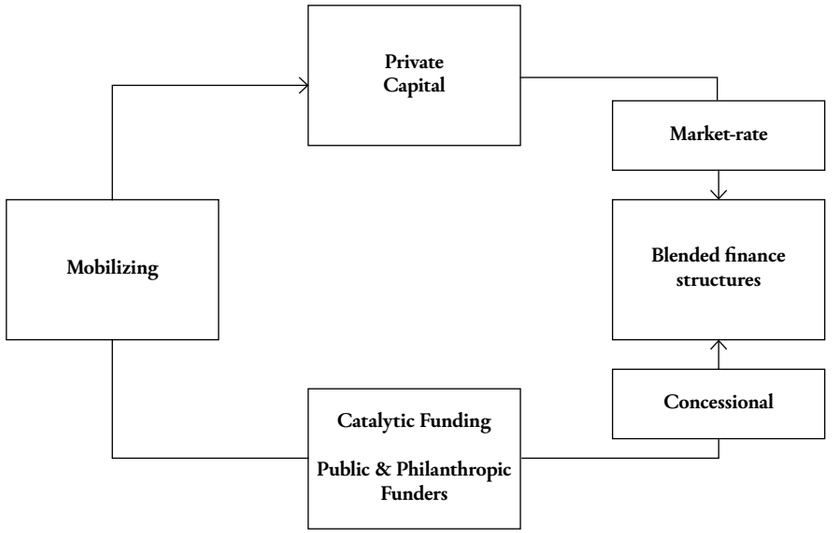


FIGURE 1: How blended finance mobilizes private capital
SOURCE: Convergence

How to scale up Nature Conservation and Restoration investments?

This case study highlights the lessons learned and best practices derived from Mirova's pioneering expertise in developing blended finance strategies. Building on Mirova's collaboration with its knowledge partner IDH[10], the case study focuses on the Land Degradation Neutrality (LDN) Fund, which invests in Sustainable Land Management (SLM) projects in emerging markets, including Latin America. Key topics addressed include: *i)* aligning stakeholder incentives through an optimal layered structure; *ii)* integrating impact, additionality, and flexible financing tools

9. https://www.convergence.finance/blended-finance

10. IDH is an international organization that brings together public and private stakeholders to make global markets more sustainable and inclusive. https://idh.org/

to create a successful investment pipeline; and *iii)* evaluating strategic considerations regarding fund positioning and diversification to maximize both financial returns and social impact. The report also includes project examples to illustrate concrete SLM investment opportunities in Latin America.

Lessons learned from Mirova's Land Degradation Neutrality (LDN) Fund

LDN Fund – Strategy and Impact thesis

Established in 2017, the Land Degradation Neutrality (LDN) Fund seeks to mobilize private capital for commercially viable projects in emerging markets that protect and restore nature through land restoration. Initiated by the United Nations Convention to Combat Desertification (UNCCD) and managed by Mirova, the fund targets projects that effectively reduce land degradation while ensuring appropriate risk-adjusted returns. To enhance its impact, the LDN Fund provides tailored financing solutions not usually available from traditional financial institutions, requiring eligible projects to significantly contribute to LDN and deliver environmental and social benefits to local communities.

The fund provides long-term financing to innovative projects across the following three key sectors of sustainable land management:

Planted Forests	Agroforestry	Agro-Ecological Transition
High-quality commercial reforestation and afforestation projects addressing the growing demand for timber.	Sustainable renovation and rehabilitation (R&R) programs focused on key commodities with favorable international market trends (e.g., cocoa, coffee).	Innovative solutions, including those driven by civil society, alongside projects focused on smaller markets and localized supply chains.

Planted Forests	Agroforestry	Agro-Ecological Transition
Active inclusion of local communities throughout grower schemes.	Strengthening existing agroforestry models with climate-resilient approaches.	—
Landscape-based approach and conservation areas that enhance biodiversity.	Strong smallholder inclusion through contractual schemes, ensuring multiple development benefits.	—
Use of exotic species only under strict environmental and social standards.	Diversified approach across sectors (fruits, vegetables, fibers), geographies, and ecosystems (including drylands and semi-arid regions).	—

TABLE 1 – SLM key sectors.
SOURCE: Mirova

The fund has successfully raised $208 million in Assets Under Management (AUM), with 79% coming from private capital, reflecting a high leverage ratio. Since its inception, the investment team has identified over 220 opportunities and invested in 13 projects with ticket size ranging from $6 million to $25 million, addressing various Sustainable Development Goals (SDGs) such as No Poverty, Zero Hunger, Gender Equality, Climate Action, and Life on Land. Table 2 below provides additional descriptives statistics of the LDN Fund.

Fund summary characteristics:

Investors Type	Junior (21%)	Senior (79%)	
Financial Instruments	Equity (26%)	Debt (39%)	Self-Liquidating (35%)
Geographical Distribution	Asia (23%)	Africa (42%)	Latin America (35%)
Sectoral Distribution	Agroforestry (45%)	Planted Forests (36%)	Agro-Ecological Transition (19%)
Impact (projection targets over fund lifetime as of 2023)	222,307 ha under Sustainable Land Management (SLM)	163,660 employees and smallholders benefiting from the projects	19.6M tons of CO2 sequestered
Impact (realized as of 2023)	138,445 ha under Sustainable Land Management (SLM)	106,299 employees and smallholders benefiting from the projects	1.7M tons CO2 sequestered

TABLE 2: LDN Fund summary characteristics.
SOURCE: Mirova

Aligning investors incentives – Designing the fund's optimal layered structure

How can blended finance be structured to effectively align the incentives and governance of the different fund's stakeholders?

The LDN Fund

The LDN Fund uses a layered capital structure (Figure 3) to offer appropriate risk-return profiles for different investors, with two categories.

- Junior investors, typically development agencies, governments, or foundations, they accept first-loss positions in the fund. Prioritizing environmental and social impact over pure financial return, they absorb higher risks to catalyze private senior investment in sustainable development.
- Senior investors, including pension funds, insurance companies, and development banks, seek market-rate returns aligned with the level of risk. While prioritizing financial performance, these investors also value the positive development impacts generated by the fund.

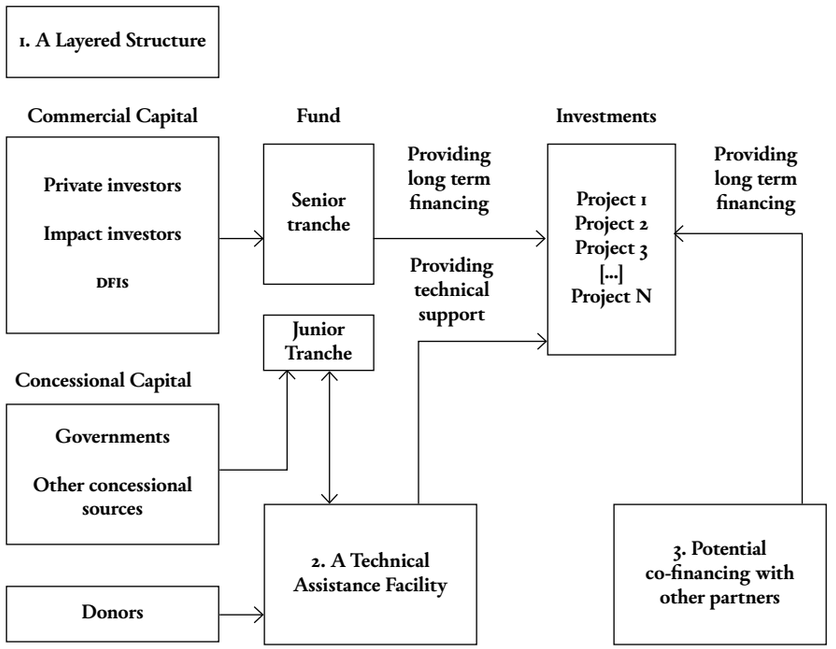


FIGURE 3: The layered structure of the fund
SOURCE: Mirova

Junior equity is crucial to the fund's investment strategy, as it mitigates risk for senior investors by absorbing first losses, thereby enhancing the overall resilience of the portfolio. This first-loss protection is particularly attractive to risk-averse institutional investors, especially given the high perceived risks associated with emerging markets and nature-based solutions. To maximize its catalytic impact, the fund adheres to minimum concessionality, strategically leveraging limited public support to facilitate a long-term transition towards the commercial financing of sustainable land management projects.

Zoom on the distribution waterfall mechanism

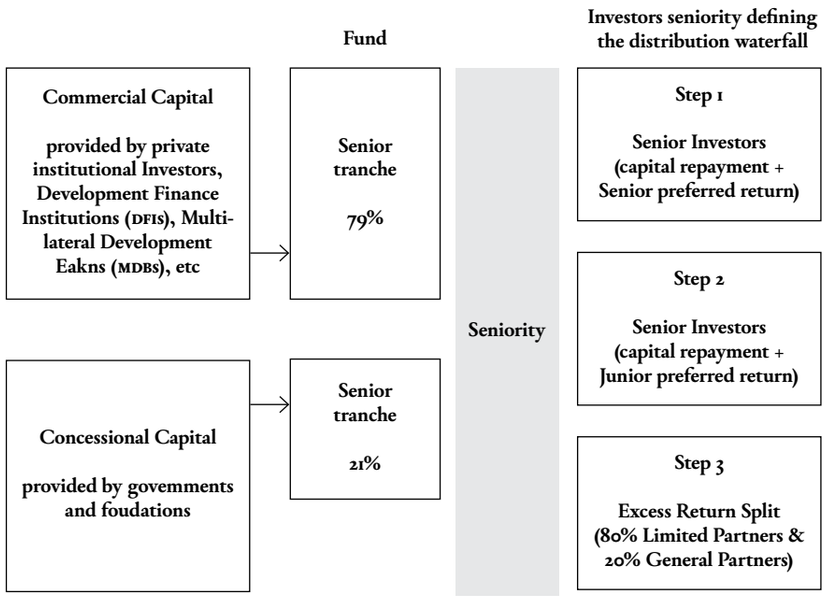


FIGURE 4: The distribution waterfall mechanism
SOURCE: Mirova

In practice, risk mitigation occurs through the Cashflow Waterfall (Figure 4), which is structured according to the seniority of each tranche, determining the conditions and order of capital repayment. Senior investors are repaid first, receiving their initial capital along with a preferred rate of return, followed by repayments to junior investors. In certain cases, junior investors may receive a partial reimbursement of their capital prior to the distribution of the preferred return to senior investors. Any remaining excess cash flow (carry) is then allocated between the Limited Partners (LPs)—the fund's investors—and the General Partner (GP). This structure offers robust first-loss protection to senior investors while allowing for flexible rates of return across the different tranches.

The investment team places particular emphasis on ensuring that senior investors & junior investors receive their preferred returns. To do this, the fund conducts scenario analysis and stress testing to evaluate how the portfolio would perform under various conditions. Mainstream scenario drivers are presented in the table below.

Scenario	Upside case	Base case	Downside case
Production [% of base]	120%	100%	80%
Price	High	Medium	Low
Cost overrun [% of base]	-10%	0%	+10%
Project delay [# years]	0	0	1 or more

TABLE 2: Scenario stress testing – Source: Mirova

These analyses offer valuable insights into the portfolio's resilience and enable the fund to take proactive measures to protect the interests of its investors. To demonstrate the robust protection provided by the junior tranche, forecasts at the LDN Fund level (Figure 5) indicate that senior investors' exit multiples would fall below 1x only if the portfolio performance drops below 60% of the base scenario by the fund's closure. Furthermore, even with a 20% underperformance relative to the base scenario, senior investors would still be able to achieve their expected preferred return. Consequently, a limited first-loss junior tranche in the portfolio (approximately 20%) provides significant protection for commercial investors, often stronger than financial guarantees. Indeed, most traditional financial guarantees do not cover 100% of potential losses and are typically specific to individual deals, sectors or geographies. Moreover, these guarantees may only address certain risks, such as currency fluctuations. However, if the junior tranche is insufficiently sized, financial guarantees can serve as an effective tool for enhancing risk mitigation for private investors.

Multiple sensitivity to portfolio performance

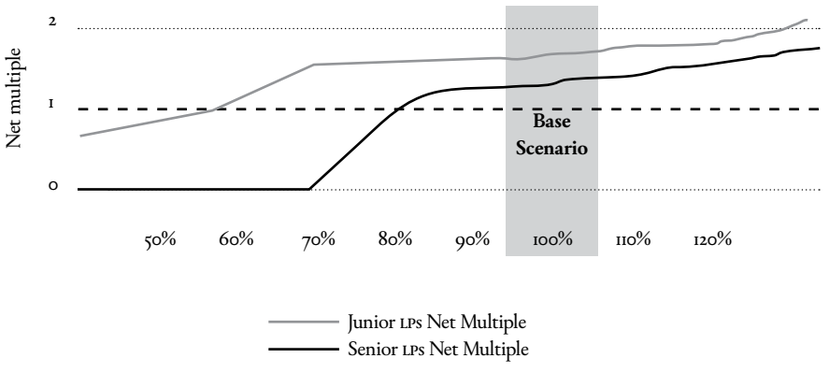


FIGURE 5: Multiple sensitivity to portfolio performance
SOURCE: Mirova

Lessons learned and best practices

Topic	Lessons learned	Best practices
Capital loss awareness	1. Layered fund structures, which incorporate junior tranches to provide first-loss protection, can offer more comprehensive coverage than traditional financial guarantees. This enhanced coverage assists private investors in understanding and realizing the benefits of the protection afforded by catalytic junior investors.	1.1. Clearly communicate the protection benefits of the layered fund structure, highlighting how junior tranches mitigate risk. 1.2. Foster the development of specific rating methodologies for the senior tranche to mitigate capital loss concerns for investors. 1.3. Increase targeted concessional fundings to help funds acquire credit ratings (e.g., through grants).

Topic	Lessons learned	Best practices
Capital Stack – Simplicity vs Customization	1. While layered structures offer risk-sharing, complex tranche structures (e.g., including mezzanine) are difficult to explain to private investors, hindering fundraising.	1.1. Prioritize simple structures by limiting the number of tranches. 1.2. While sometimes appealing to DFIs, more complex structures embedding mezzanine financing should be carefully considered, especially when targeting private investors.
Waterfall structure	1. For senior investors, protective mechanisms are often complex and can be a source of apprehension, as they tend to focus on worst-case scenarios. 2. It is sometimes easier to induce junior investors (especially foundations) to accept higher risk than to accept lower expected returns; they are willing to accept risks in exchange for the potential of higher returns.	1. Develop a clear and compelling waterfall model that balances the risk/return expectations of both junior and senior investors, even if those expectations seem to be opposed. 2. Prioritize catalytic capital and protection over return differences between junior and senior LPs.
Calibrating the Junior Tranche	1. Calibrating the junior tranche involves balancing catalytic impact with minimum concessionality. Beyond taking into consideration market practices (around 20% of concessional capital), the "right" size is often determined through an iterative process among potential LPs. 2. The misperception of risks and opportunities in emerging countries is often significant. Therefore, providing robust estimates based on real track record would participate to reducing perceived risk, easing fund structuring and optimizing concessional capital use.	1. Balance catalytic goals with the need to attract mainstream investors, aiming for a junior tranche size that signals a robust business model while providing credible first-loss protection. 2.1. Develop robust and publicly available track record of realized returns, default probability and recovery rate for private equity investments in emerging markets and frontier markets. 2.2. Emphasize lower risk and returns diversification with respect to traditional asset classes (see Cole et al. 2024[11]) to reduce market mispricing resulting from inaccurate risk perception.

11. "Long-run Returns to Private Equity in Emerging Markets" World Bank Policy Research Working Paper (2024)

Topic	Lessons learned	Best practices
Fundraising – A sequential approach	1. The expectation that gaining the tender offer from UNCCD would simplify the process of raising junior capital was overstated; in reality, the process took longer than anticipated. 2. Senior investors seek a balance between protection and returns. 3. Catalytic capital is crucial for initiating early-stage investments during the fundraising phase.	1. Prioritize securing the junior tranche early in the fundraising process to unlock commercial investments. 2. Assemble a specialized team to engage with junior investors. It's important to allocate sufficient time for pre-investment presentations, which can easily take one to two years. 3. If junior capital is limited, seek catalytic investors who are willing to accept larger drawdowns to enable early-stage investments. This will make it easier to attract commercial capital after showcasing initial investments.
Optimal Fund Size	1. Commercial investors have minimum ticket size expectations and maximum holding ratios, both at the fund and tranche levels. Therefore, a fund size that is too small may deter private capital participation. 2. Conversely, in addition to inherent project risks, capital deployment faces challenges due to the fund's global reach and the nature of its investments – making private debt structuring is time-consuming and complex compared to other asset classes.	1.1. Leverage an existing track record to adjust ticket sizes in a way that aligns with the expectations of private investors. 1. 2. Ensure that fundraising efforts are well-calibrated to effectively secure the junior tranche, as this is crucial for the overall fund strategy. 2. Carefully calibrate the size of the fund to match deployment capabilities, ensuring that it aligns with market conditions and investor requirements.
Debt or Equity for LPs	1. Offering senior debt with fixed interest rates proved problematic due to difficulty in repricing during changing market conditions and regulatory complexity. These issues made raising private capital more challenging.	1.1. Prioritize equity offerings for LPs due to their inherent flexibility and alignment with asset performance. 1.2. When providing notes, evaluate the pros and cons of floating versus fixed interest rates.

Topic	Lessons learned	Best practices
Governance Between LPs	1. Differentiated veto power / governance rights across tranches can create complexity. 2. Junior tranches' specific geographic / sector preferences can conflict with portfolio diversification objective.	1. Maintain uniform governance rights for all LPs, regardless of their seniority. 2. Resist the temptation to create specialized "pockets" for junior tranches, as it hinders diversification and complicates fundraising.
Strengthening regulatory frameworks	1. Lack of clear government guidelines for blended finance hindered investor engagement.	1.1. Advocate for transparent and supportive regulatory frameworks for blended finance, positioning it as a development tool to encourage investor confidence. 1.2. Encourage third party research to provide independent insights at affordable cost and on a timely basis.

Integrating impact, additionality and innovative financing tools to build a successful strategy

How can a fund be strategically designed, with appropriate financing tools and technical assistance, to maximize impact, additionality and foster successful project development?

The LDN Fund

Measuring projects' positive impact

To maximize its environmental and social impact, the LDN Fund takes a holistic approach, considering both direct environmental effects and social impacts on employees and communities (Figure 6).

Key impact themes targeted by the LDN Fund

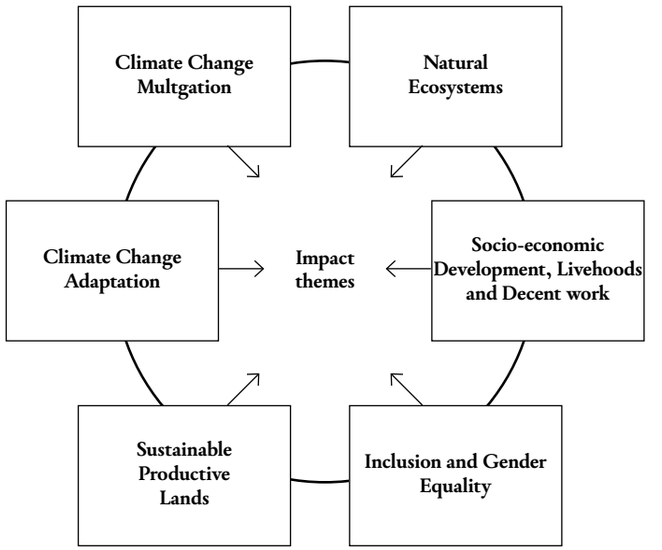


FIGURE 6: Key impact themes targeted by the LDN Fund
SOURCE: Mirova

Investees report annually to the LDN ESG team on key metrics such as surface under Sustainable Land Management (SLM), number of beneficiaries, and CO2 sequestered. For complex indicators like carbon accounting, the LDN team partners with specialized firms to ensure data quality and consistency[12]. Beyond mere impact, the LDN Fund aims to achieve additionality, a core principle of sustainable investing, by generating positive environmental, social, and economic outcomes that would not have materialized without the Fund's intervention.

Financial Additionality

The LDN Fund's financial additionality is reflected in its funding of entities that would otherwise struggle to secure similar terms from private capital markets

12. [MIROVA x I Care] « Notice agrégation méthodes de calcul des émissions »

for similar developmental purposes[13]. The blended nature of the fund allows it to support riskier projects with long-term investment horizons (8-10 years). It also offers tailored financial instruments including equity (most suitable for firms with stable cash flows and clear exit strategies in stable markets), debt (favored in underdeveloped markets or where a clear exit buyer is absent), and innovative self-liquidating structures (most ideal for complex legal environments and companies with unstable cash flows) ; these instruments are strategically chosen based on each investee's context (e.g., market stability) and growth trajectory.

Beyond financing, the LDN Fund provide critical support to investees through its Technical Assistance Facility (LDN TAF), a €5 million grant-making arm managed by IDH. The TAF contributes to project viability by enhancing capacity-building, de-risking investments, and helping invitees comply with reporting requirements. Ultimately, the TAF further enhances the LDN fund's financial additionality by bridging the gap between initial due diligence and successful investment.

Developmental Additionality

Beyond financial additionality, the LDN Fund drives developmental additionality by improving project impacts in ways not achievable without public-private partnerships.[14] The Fund bridges gaps (often neglected by market actors) in expertise and sustainability, allowing it to catalyze regenerative agriculture, enhance supply chains and promote SLM while establishing social safeguards. Such support, combined with heightened E&S standards and TAF integration of social and environmental objectives (such as gender equality and regenerative agriculture pilots), drives transformative change in agricultural value chains.

13. OECD DAC BLENDED FINANCE PRINCIPLE 2 GUIDANCE (2022)

14. https://www.oecd.org/content/dam/oecd/en/events/2022/5/cefim_blended-finance-guidance-for-clean-energy---2nd-workshop/Guidance-note-OECD-DAC-Principle-2.pdf/_jcr_content/renditions/original./Guidance-note-OECD-DAC-Principle-2.pdf

Lessons learned and best practices

Topic	Lessons learned	Best practices
Expected impact vs Realized	1. Predicting development impact, especially over a long horizon, is difficult. Junior investors are increasingly focused on the actual impact being achieved. 2. The real-world impact of commercial forestry projects, combined with discussions around carbon sequestration, has encouraged some investors to seek a deeper understanding of their potential benefits and challenges.	1. Just as financial scenarios are rigorously assessed; base case impact scenarios should be critically evaluated. Building a strong team of external experts with diverse skills is essential for accurately measuring and forecasting the complexities of environmental and social impacts. 2. Rely on established and widely accepted methodologies for assessing impact to ensure credibility and encourage companies to develop diverse revenue streams within their business models to enhance resilience, particularly regarding voluntary carbon and biodiversity credits.
Impact Attribution	1. Best practices for impact attribution at the fund level are evolving rapidly, with limitations arising from reporting total absolute impacts of investments.	1. Craft a compelling narrative around impact attribution, ensuring that attribution is weighted by the relative financing provided as a minimum safeguard for future assessments.
Aligning financial returns with development impact	1. Aligning financial returns with specific project outcomes ensures companies are incentivized to achieve developmental impact.	1. Implement performance-based incentives that reward investees based on the achievement of specific, measurable project outcomes, directly linking financial returns to developmental impact.
Technical Assistance	1. Securing sufficient funding for a Technical Assistance Facility (TAF) is challenging but essential for the strategy's success. 2. Transforming early-stage support from TAF into portfolio investment can be difficult, yet maximizing impact through capacity building has been effective. 3. TAF has also played a crucial role in shaping impact strategies and KPIs.	1. Aim for a TAF capacity of about 2-3% of total Assets Under Management (AUM) to deliver measurable outcomes. 2. Ensure alignment between TAF and investment teams to strengthen project selection continuity. Emphasize TAF role to enhance best practices and share expertise across the portfolio. 3. Recognize TAF as an important tool for asset managers with limited capacity.

Fund positioning and risk management

The LDN Fund has now transitioned into the portfolio management phase, concentrating on the successful and sustainable development of its portfolio companies and projects. This phase is crucial for enhancing value creation while generating positive social and environmental impacts on the ground. As the fund navigates the complexities of investing in emerging markets, it has drawn valuable lessons from its experiences, emphasizing the importance of strategic positioning and comprehensive risk management. By integrating these insights into its operational framework, the LDN Fund aims to foster sustainable growth and resilience among its investees.

As the fund engages in active portfolio management, it recognizes the necessity of a thorough approach to monitoring its investee companies. This proactive stance ensures that each investment is not only performing in alignment with expectations but is also positioned to adapt to the inherent challenges of emerging markets. By requiring regular updates on key performance indicators and detailed financial reporting, the LDN Fund cultivates a culture of accountability and transparency. This ongoing dialogue with investees allows for timely interventions when needed, ensuring that potential issues can be addressed before they escalate.

Moreover, the LDN Fund understands that effective risk management is paramount in navigating the complexities of diverse markets. It strategically balances its portfolio to mitigate exposure to high-risk investments while prioritizing partnerships that enhance resilience in uncertain environments. Building strong relationships with local partners is a cornerstone of this strategy, as it enables the fund to leverage local expertise and navigate regulatory landscapes more effectively. By diversifying its investments and establishing robust governance frameworks, the fund enhances its ability to respond to market fluctuations and operational challenges.

Lessons learned and best practices

Topic	Lessons learned	Best practices
Emerging markets – Country risk	1. Adverse conditions arising from possible changes in the business environment. 2. Investing in high-risk countries (DAC List) presented several challenges. This included difficulty attracting additional investment, regulatory and operational risks that were hard to manage in a downturn, and low liquidity for equity.	1. Ensure strong portfolio diversification with limited exposure to a given country. Use political risk insurance policies if deemed necessary and available. 2.1. Prioritize lower-risk emerging markets based on country risk ratings. 2.2. Limit high-risk investments proportional to the junior tranche to mitigate potential losses.
Emerging markets – Market risk	1. Risk of losses arising from a fluctuation in the market value of the positions attributable to a change in the market variables.	1.1. Prioritize projects with revenue streams tied to different markets. 1.2. Implement hedging strategies for specific price fluctuations.
Emerging markets – Currency risk	1. The currencies of production and sales differ, with currency pairs often experiencing fluctuations between the US Dollar and local currencies.	1.1. Prioritize financing in the same currency as project revenues to minimize currency risk. 1.2. Carefully evaluate and hedge local currency financing.
Investment pipeline – Local partners	1. Sourcing from a wide range of countries diluted focus and hindered the ability to build strong relationships with local partners.	1.1. Balance impact sourcing channels with business-oriented ones within a defined geographic scope. 1.2. Prioritize building strong relationships with local partners (local developers, banks, advisors) to leverage agile, cost-effective structures and local expertise.
Investment pipeline – Deal Flow	1. Insufficient deal flow hindered rapid capital deployment.	1. Build a multidisciplinary team with strong sourcing networks and proven transaction execution to ensure a consistent deal flow of investment-ready opportunities.

Topic	Lessons learned	Best practices
Investment pipeline – Liquidity	1. Lack of exit options created liquidity challenges.	1.1. Prioritize providing investees with long-term debt. 1.2. Limit portfolio exposure to equity investments and focus only on assets that are actively sought by strategic or secondary buyers.
Deals execution – Tracking financial performance	1. Lack of timely financial data hindered proactive problem-solving with portfolio companies.	1. Require monthly KPIs and quarterly reports (P&L, balance sheet, cash flow) and commentary on operations and financial health for proactive performance management.
Deals execution – Investment Disbursement	1. Milestone-based disbursements with strict KPI targets are essential for managing risk and ensuring investee accountability	1. Implement milestone-based disbursements tied to operational, financial, and ESG KPIs.
Deals execution –Governance	1. Actively participating in governance (board seat or observer) is critical to influencing strategic direction and safeguarding investments.	1. Secure board representation or observer status to enhance investee governance and align with fund objectives.
Frontier projects – Greenfield projects	1. Investing in greenfield agriculture/forestry in emerging markets had high cash burn, requiring faster follow-on funding.	1.1. Balance portfolio with mature assets generating EBITDA. 1.2. Prioritize experienced teams with proven track records to manage greenfield risks.
Frontier projects – Smallholder farmers scheme	1. Involving and securing consistent supply from smallholder farmers in the long term proved challenging.	1. Carefully evaluate smallholder schemes, avoiding them in greenfield projects. Reserve them for more mature companies with established supply chains.
Frontier projects – Long term off-taker	1. Sole reliance on long-term off-taker agreements limited market access and increased exposure to price volatility.	1.1. Diversify sales channels beyond long-term agreements. 1.2. Collaborate with corporations' sourcing and carbon in setting programs for improved revenues predictability.

Deep dive in projects

Project 1 — SLB (Aloe Agroflorestal)

- Country: Brazil
- Activity: Timber (Planted Forests)
- Instrument: Debt
- Duration: 10 years
- Investment Size: $12 million
- Other Levers: 50% women at board level, FSC-certified

Background & Context

Brazil's degraded land ranges between 60 to 135 million hectares, as reported in the latest report by MapBiomas. That is up to 25% of Brazil's native vegetation may be degraded, and even if deforestation rates have improved recently, it remains high. Rapid agricultural expansion has led to declining yields, biodiversity loss, and significant challenges for local populations trying to sustain livelihoods from the increasingly unproductive land.

SLB manages 5,000 hectares of Forest Stewardship Council (FSC)-certified plantations in Brazil, including 3,000 hectares of commercial plantations and 1,500 hectares of preserved forests with native non-commercial species. It aims to restore up to 20,000 hectares of degraded land by developing thriving planted forests to supply sustainably sourced wood to international markets, thus intensifying conservation and restoration efforts in Brazil.

Investment & Technical Assistance

To support SLB's ambition, the LDN Fund invested $12.6 million for the acquisition and the funding of three assets spanning a total of 1,400 hectares—850 hectares of commercial plantations and 550 hectares of preserved areas. These lands represent 35% of SLB's total controlled area. The debt included a grace period to align with the project's expected cash flows. The investment was made under a newly created special-purpose vehicle called Aloe Agroflorestal. SLB established a forestry asset on parcels of degraded land, creating a mosaic of forestry and conservation areas. The LDN Fund is participating in the project's governance with two seats on the board. The initiative is also expected to become part of the World Resources Institute's 20x20 initiative.

The post-investment TA for SLB strengthened its capacity to implement its growth plans while maximizing E&S impact. SLB, an ambitious organization, sought to use

impact assessments to demonstrate its contributions to soil health and biodiversity. The TA provided essential information and expert advice to go beyond its historical activities and elevated other outcomes. SLB's commitment to closing the living income gap for workers—well beyond the legal minimum wage—was also noteworthy.

Technical Assistance
Nature: Post-Investment
Key Activities:

1. Gender Mainstreaming
2. Biodiversity Measurement & Monitoring
3. Soil Impact Assessment
4. Pilots for Sustainable Livelihoods Opportunities
5. Strengthening ESMS

Progress & Impact

After receiving investment from the LDN Fund and support from the LDN Technical Assistance Facility (TAF), Aloe Agroflorestal (SLB) has made significant progress in several areas. The company has completed all planned forestry plantations, which are now entering the maintenance phase, and has mitigated off-taker risk by shortlisting potential buyers, including an outdoor furniture producer and a wood panel manufacturer, for its mature timber. SLB expects to issue its first carbon credits by 2025, having received expressions of interest for all of them following the VERRA audit process.

Moreover, the LDN Fund's active involvement in SLB has helped the company gain experience in designing projects to attract larger investors. The TAF support also had a substantial societal, enabling the analysis of soil samples in SLB's planted areas revealing positive biological, physical, and chemical outcomes, and helping develop a comprehensive gender strategy and action plan to enhance sustainability efforts.

Investment Impact Indicators	Impact Achieved (2023)	Impact Target (2033)
Hectares under SLM	1,340 (36% of native forests preserved)	1400
Tonnes of CO2 Sequestered	95,979	190,000
Workers Employed for Operations	39	310

Project 2 – Urapi Sustainable Land Use

- Country: Colombia, Peru and Honduras
- Activity: Coffee, Cacao and Honey
- Instrument: Self Liquidating Instrument
- Duration: 15 years
- Investment Size: $25 million
- Other Levers: >30% women at board, meets 2X Challenge, Organic and Fairtrade certified

Background & Context

Latam coffee cooperatives can find it difficult to transfer value to smallholder producers due to limited market access and insufficient investment in processing infrastructure. As a result, producers receive lower prices. Ageing, unproductive coffee plantations and poor climate resilience further reduce yields and income. Smallholders face barriers such as restricted access to affordable long-term credit, inadequate knowledge, and weak management practices, creating a cycle of migratory agriculture, deforestation, and preventable income loss.

The Urapi programme, developed and managed by Ecotierra, supports the growth of mid-sized cooperatives in Peru, Honduras, and Colombia. Its mission is to drive sustainable development for selected coffee cooperatives and their smallholder producers. Urapi achieves this by providing inputs and credit to smallholders while focusing on land restoration, agroforestry implementation, processing facility development, and carbon credit generation.

Investment & Technical Assistance

At the end of 2018, the LDN Fund made its first investment in Urapi to support innovative agroforestry initiatives across Latin America. It committed $25 million through a self-liquidating instrument to finance essential equipment, microcredit for smallholders, and operating expenses. The fund aims for market returns while actively participating in Urapi's governance through membership in its investment and advisory boards. The Urapi program completed its deployment phase in December 2023 and is now managing four projects in Latin America:

1. Cafe Selva Norte (CSN): The project engages with coffee cooperatives in Peru to scale agroforestry by providing technical and working capital support, impacting 8,000 Ha.
2. Sierra Nevada (SN): The project aims to foster the transition to more sustainable land use practices across 4,000 Ha in Columbia while supporting the

development of smallscale processing facilities for coffee, honey, cocoa, and potentially timber.

3. Valle Verde (VV): The project is built on an alliance between Urapi and the COCLA cooperative, aiming to restore COCLA's role as a regional leader in the coffee, cocoa, and honey value chains. It will finance the renovation and implementation of agroforestry systems on COCLA producers' farms, complemented by a technical support package, targeting 2,600 hectares in Peru.
4. Aroma Café y Miel (HN): The project builds on a partnership between Urapi and several cooperatives supported by a Canadian NGO, this project strengthens the sustainable development of the coffee and honey value chains by financing agroforestry, enhancing processing capacities, and improving direct market access.

While the final two projects were finalized at the end of 2023, the LDN TAF has provided extensive post-investment support, helping to de-risk the investment and enhancing the projects' impact. For CSN, the TA support focuses on leadership development, climate risk mitigation and capacity building for partner cooperatives. For SN, the TA support was geared toward developing sustainable value chains monitoring biodiversity and fostering partnerships.

Technical Assistance
Nature: Post-Investment
Key Activities:

Cafe Selva Norte

1. Leadership Development and Capacity Building for Partner Cooperatives
2. Plan for Minimizing Climate Risk and Introduction of New Coffee Varieties
3. Timber Market Study
4. LDN Baseline Development
5. Financial and Management Capacity Building with Partner Cooperatives

Sierra Nevada

1. Timber Value Chain Business Plan
2. Honey Value Chain Feasibility Study
3. Bean to Bar Cacao Study
4. Producer Baseline Mapping
5. Biodiversity Monitoring and Baseline
6. Sustainable Development Verified Impact Certification Document Development
7. National Level LDN Workshop

Progress & Impact

After receiving investment from the LDN Fund and post-investment support from the LDN Technical Assistance Facility (TAF), Urapi has made significant progress and achieved notable impact in several areas.

Urapi's operational performance soared this year, particularly due to the peak coffee season, with CSN achieving its highest operational levels. The company is consolidating its operations by leveraging local coffee sourcing for milling and export. Furthermore, HN has secured its first coffee sales contracts and is advancing in setting up its facilities, while VV has completed maintenance on its agribusiness plant and is now fully operational, with the mill running continuously and its credit division successfully obtaining initial loans.

The TAF support has facilitated capacity-building efforts, enabling Urapi to conduct training workshops on farm cost analysis, governance, business management, gender equality, and best practices, all aimed at strengthening cooperative-member relationships and mitigating investment risks. Additionally, Urapi has developed and integrated business plans for timber, cocoa, and honey into the project, aligning these value chains with farmers' agroforestry designs through dedicated workshops.

Investment Impact Indicators	Impact Achieved (2023)	Impact Target (2033)
Hectares under SLM	58,167	70,742
Tonnes of CO2 Sequestered	29,476	5.1 Million
Workers Employed for Operations	890	4,500

Project 3 – Terrasos (Colombia)

- Country: Colombia
- Activity: Agroforestry; Biodiversity credits
- Instrument: Debt
- Duration: 9 years
- Investment Size: $6.5 million
- Other Levers: women make up 40% of board members and 57% of senior managers, meets 2X criteria

Background & Context

Colombia is recognized as a megadiverse country, home to a range of ecosystems as well as significant biodiversity and resources. Preserving such ecosystems has proven difficult due to extractive industries (oil and gas, mineral and metal extraction), livestock ranching, agriculture, urbanization and wildlife trafficking among others.

To address these issues, Terrasos was founded in 2013 to restore Colombia's ecosystems through Habitat Banks, which aim to actively preserve biodiversity and mitigate human impacts. These designated areas implement sustainable land use practices to offset biodiversity loss. They cost efficiency through pre-approved registrations, long-term results over at least 20 years, and scalable impacts. It also includes a monitoring system for accountability and promotes local employment by prioritizing hiring for fieldwork.

Terrasos generates "payments for environmental results" based on performance, defining one biodiversity unit (BU) as 10 m^2 of protected habitat for 20 years. Credits generated by a Habitat Bank depend on the number of BUs and a quality score that considers factors like threat level, conservation intensity and duration, and community involvement. Companies needing to offset environmental impacts can purchase these credits instead of managing their own projects.

Early use case arises from compliance required biodiversity mechanisms such as biodiversity offsets. For instance, companies whose projects (e.g., mines, agrobusiness) must offset residual impacts under Colombia's environmental-licensing rules can buy compensation credits instead of running their own offset projects.

Investment & Technical Assistance

Terrasos is expanding its Habitat Banks in Colombia and throughout Latin America, aiming to increase its managed area from 7,000 hectares to 20,000 hectares by 2026. The organization is also working on a system to generate payments for biodiversity credits, taking advantage of the emerging voluntary biodiversity credits market . In 2023, the LDN Fund invested $6.5 million in Terrasos, structured as senior debt with a 9-year tenure, to support its expanding activities. This funding includes a grace period to align with the project's expected cash flows.

To enhance its environmental impact monitoring and establish a risk management system for both existing and new Habitat Banks, Terrasos is currently undergoing post-investment TA. This 9-month support focuses on three key activities: impact monitoring, additionality assessment, and risk management.

Technical Assistance
Nature: Post-Investment
Key Activities:

1. Strengthening biodiversity monitoring approach and testing innovative techniques.
2. Developing a method to quantitatively assess the impact additionality of Habitat Banks in relation to their surrounding environments.
3. Creating a comprehensive risk management system for the operations of new and existing Habitat Banks.

Progress & Impact

Since the investment was made in 2023, data for 2024 is still being consolidated, therefore no progress can yet be assessed.

Investment Impact Indicators	Impact Achieved (2023)	Impact Target (2033)
Hectares under SLM	6,000	20,000
Tonnes of CO2 Sequestered	N/A	N/A
Workers Employed for Operations	N/A	250

Conclusion

These lessons learned underscore the effectiveness of a simple yet powerful blended finance structure in protecting private investors by utilizing different layers of capital to manage risk among various stakeholders.

Foundations and governments serve as vital junior catalytic capital providers, working alongside Development Finance Institutions (DFIs). These entities play a crucial role by bearing higher risk, providing anchor capital, and supporting technical assistance (TA) initiatives. Together, this blended finance approach enables the mobilization of private capital for investment in emerging markets, facilitating significant investments in impactful yet riskier projects—thanks to the

protection afforded by junior capital. Additionally, this approach enhances project bankability and impact through TA. Collectively, these elements allow for capital deployments in frontier businesses that would otherwise struggle to secure funding, demonstrating strong additionality.

To further reduce investors' risk misperception and optimize the use of concessional capital, there is a pressing need for greater transparency and data regarding realized returns and default probabilities in sectors that are poorly analyzed, such as agroforestry. This transparency is essential for enhancing investor confidence and ultimately scaling blended finance initiatives. To address this need, Mirova, through the Mirova Research Center, has launched a partnership with Columbia SIRI to develop academic research focused on blended finance. This collaboration aims to provide rigorous insights to decision-makers and facilitate the mobilization of private capital toward impactful environmental and social projects in the Global South.

Building on the experience gained from managing the LDN Fund, Mirova expanded its natural capital platform in 2023 with the launch of the Mirova Sustainable Land Fund 2 (MSLF2), as announced in November at the 28th Conference of Parties (COP28). This new fund will continue the strategy of the LDN Fund, aiming to facilitate the transition and decarbonization of agricultural and forestry value chains. Its goals include generating financial returns while delivering positive impacts related to climate change adaptation and mitigation, biodiversity conservation, and social inclusion, particularly for women in emerging economies. The fund will focus on sectors such as agroforestry, regenerative agriculture, and sustainable forestry, leveraging the lessons learned and successes of the LDN Fund.

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Sabesp A historic opportunity to achieve universal access to water

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Abstract

Sabesp, Latin America's largest water and sanitation utility, is undergoing a historic transformation. Following the 2020 Water and Sanitation Legal Framework, which mandates universal access to clean water and sewage services by 2033 in Brazil, the company became the first state-owned utility of its size to be privatized under the new regulatory regime. The move was designed to accelerate infrastructure delivery, improve governance, and attract long-term private investment. The privatization came with conditions: Sabesp is required to meet universalization targets by 2029, four years ahead of the Federal timeline, while maintaining affordable tariffs and expanding access across its entire territory.

This case study analyzes how Sabesp responds to this challenge through a comprehensive institutional realignment. It explores the company's transition from formal compliance to strategic governance, adopting a materiality-based ESG strategy and implementing performance indicators that capture environmental and social outcomes. It also examines how Sabesp has leveraged innovative financing instruments such as blue bonds and initiated efforts to structure blended finance and impact-linked mechanisms. The study highlights the company's distinctive approach to community engagement through programs like *Se Liga na Rede* (Connect to the Network) and *Água Legal* (Legal Water), which serve as platforms for inclusion, health promotion, and climate justice.

Sabesp's transformation illustrates how public utilities in the Global South can modernize and attain their public mission. By aligning governance, finance, and sustainability around measurable outcomes, the company is building a model that is both investable and socially transformative.

A Race for Universal Access

In Brazil, over 30 million people still live without access to safe drinking water, and nearly half the population lacks adequate sewage treatment[1]. This infrastructural gap undermines not only public health but also economic mobility, gender equity, and climate resilience. It is a structural barrier to development that affects millions of Brazilians daily, particularly in the country's poorest and most vulnerable communities.

In response, the Federal government enacted the Water and Sanitation Legal Framework in 2020, establishing a legally binding goal: achieve universal access to clean water by 2033 and extend sewage collection and treatment to at least 90 percent of the population. The estimated investment required to meet this goal exceeds USD 140 billion (World Bank, 2021). Traditional public funding alone would not be sufficient. New models of financing, governance, and accountability are now indispensable.

At the center of this transformation is Sabesp, the water and sanitation company of the State of São Paulo, created in 1973. With a history of more than 50 years, Sabesp is responsible for more than a third of the total CAPEX in the sector in Brazil. As the third largest water utility in the world and the largest in Latin America, Sabesp serves more than 28 million people across 375 municipalities in its home State. In 2023, it became the first state-owned utility of its size in Brazil to undergo privatization under the framework established by Law No. 14,026/2020. The move was designed to accelerate infrastructure delivery, improve governance, and attract long-term private investment, and marked a new chapter in the company's institutional trajectory.

Expectations are high. The company's privatization came with three main conditions. The new regulatory contracts require Sabesp to reach 99 percent water access and 90 percent sewage coverage by 2029, four years ahead of the Federal deadline of 2033. The company is also required to maintain affordable tariffs for low-income users and cover the entire territory of the municipalities it serves. To meet this goal, Sabesp will need to meaningfully increase its average annual investment level and execute over USD 13 billion in infrastructure projects until 2029. Being on time with

1. Nearly 32 million Brazilians lack access to safe drinking water, while around 90 million do not have adequate sewage collection. These deficits directly impact public health, resulting in frequent hospitalizations from waterborne diseases (Instituto Trata Brasil, 2024).

universalization targets is also a precondition before the company can distribute dividends, and will directly impact its revenues and profitability.

Rather than a trade-off, Sabesp's public mandate is a driver of long-term financial performance. Expanding access to sanitation increases the user base and revenue streams while reducing public health costs, fostering social stability, and strengthening environmental stewardship.

> "The company is undergoing a deep transformation. The new model of concessions combines efficiency, bold targets, and a social focus. Privatization is the starting point for a new contract with society."
> Carlos Piani, CEO

This case study explores how Sabesp has stepped up to meet this historic challenge and how sustainability is ingrained into its strategy. It analyzes the use of innovative instruments such as blue bonds, impact metrics, and a revised sustainability governance, which is not meant to change what the company does but rather how sustainability is part of the strategy and how Sabesp communicates with its stakeholders. With the privatization, Sabesp embraces the opportunity to open up to the communities it serves and to the world. The analysis also shows how Sabesp is investing in social infrastructure through programs such as *Se Liga na Rede* (Connect to the Network) and *Água Legal* (Legal Water).

> "Our ambitious growth plans require reaching out to investors globally and sustainability is key to our strategy and our success. However, the financial architecture today does not fully reward impact."
> Karla Bertocco, Member of the Board of Directors

Sabesp's journey suggests that universal access to essential services is not just an engineering problem. It is part of an institutional strategy to strengthen the company's social license and to generate inclusive, measurable value for society.

Internally, Sabesp's leadership framed the universalization goal as a compliance mandate and a competitive advantage. Executives see infrastructure delivery as an opportunity to reposition the company's brand in Brazil and abroad. Universalization is the basis of a narrative of efficiency and inclusion that resonates with international partners and investors. This strategic positioning has influenced how the company approaches public communication, focusing less on technical milestones and more on the real-world impact and long-term social returns of infrastructure access.

The Regulatory Framework for Sanitation in Brazil

From Fragmentation to Performance-Based Governance

For decades, Brazil's sanitation sector operated under a fragmented institutional logic. Local governments contracted services through state-owned enterprises. Coverage was uneven, particularly in the less developed North and Northeast regions. The incentives for operational efficiency, innovation, or universal access were minimal. Investments were insufficient to close the infrastructure gap.

The passage of Law No. 14,026/2020, known as the Water and Sanitation Legal Framework, underscored a new social awareness around the importance of access to water and sewage treatment. The law aimed at reaching universal access to water and wastewater services by 2033 as a national mandate. It introduced performance-based contracts, which link revenue to service expansion, quality delivery, and operational benchmarks, and required all service providers to demonstrate technical, operational, and financial capacity to meet defined targets. It also established the legal basis for competitive bidding of service concessions, effectively ending the automatic renewal of contracts previously granted to state-owned utilities.

> "The new law forced companies to rethink not only how they operate, but how they relate to society. The social license to operate is one of the most relevant aspects of universalization."
> Samanta Souza, Executive Director of Institutional Relations and Sustainability

A critical feature of the new framework is the promotion of regionalized service models. By encouraging municipalities to come together as a block, the law enables streamlined contracts, economies of scale, reduced asymmetries in service delivery, and increased attractiveness of projects for private and mixed-capital investors. The underlying logic is simple: larger, integrated systems allow for more efficient planning, lower unit costs, and better alignment between public priorities and private investment.

The reform also redefined the role of the Federal government. The National Water and Basic Sanitation Agency (ANA) was empowered to issue reference standards for service quality, tariff regulation, and performance monitoring. Although ANA does not replace state-level regulators such as São Paulo State Public Services Regulatory Agency (ARSESP), its guidance sets the technical baseline for service

expansion across the country. Utilities must now operate under a multi-tiered regulatory framework, where Federal guidelines inform local enforcement.

Implications for Sabesp: The URAE Model

Historically, Sabesp operated through hundreds of individual contracts with municipalities, many of them inherited from previous legal regimes. These agreements varied in duration, tariff structure, and oversight mechanisms. In response to the 2020 law, the State government created the *Unidade Regional de Águas e Esgotos* (Regional Unit for Water and Sewage, URAE), a new governance architecture that grouped multiple municipalities under a single regional block. The creation of the URAE allowed Sabesp to renegotiate its service contracts under a unified framework, harmonizing tariff rules, aligning oversight mechanisms, and extending contract duration.

The URAE is governed by an intermunicipal consortium, which holds the authority to approve investment plans, set targets, and monitor execution. This structure balances local autonomy with regional efficiency. It also introduces a new accountability layer: Sabesp responds not only to ARSESP but also to a collegiate of municipalities that represent the interests of millions of end users. One example is the Alto Tietê sub-region, where more than a dozen municipalities previously under separate contracts now coordinate jointly under the URAE governance scheme.

The new contracts signed with the URAE establish binding targets for water and sewage coverage, with specific milestones for each year until 2029. Advancing the national target from 2033 to 2029 has direct implications for the company's capital planning, procurement strategy, and governance processes. This regulatory evolution has been reflected in Sabesp's financial outlook.

Regulation as a Driver of Capital Mobilization

The New Water and Sanitation Framework does more than establish service obligations. It reshapes the financial architecture of the sector. Historically, public funding

and multilateral organizations have been the main providers of capital for the sector. Private capital is now a structural pillar of the sector's future.

The legal framework creates conditions for investment by defining performance standards, clarifying regulatory risks, and encouraging regional structuring. In turn, these elements reduce perceived uncertainty for investors, facilitate access to credit, and enable the development of innovative financial instruments. These instruments tie financing conditions to the issuer's ability to meet specific environmental or social targets, enhancing accountability and signaling impact alignment (OECD, 2022).

Sabesp is one of the first utilities to respond fully to this logic, in particular with the issuance of sustainability linked-loans and BRL-denominated blue bonds. After the privatization process, the company signaled its readiness to align with a governance model grounded in investor discipline, operational flexibility, and measurable impact. For example, in early 2025, the company tripled its contracted capital expenditures compared to the same period in 2024, reflecting its new ability to execute infrastructure at scale and pace (BNDES, 2024). The new contracts signed under the URAE regime ensure predictable cash flows and performance monitoring, which strengthen the company's credit profile and expand its financing capacity.

Privatization and Investment Acceleration Unlocking Capital Through Institutional Reform

The decision to partially privatize Sabesp in 2023 was a response to structural pressures: the legal obligation to achieve universal access, the limits of public financing, and the need to modernize a utility that had outgrown its institutional model. By transforming its capital structure and governance framework, Sabesp sought to unlock investment, reduce execution bottlenecks, and reposition itself as a twenty-first-century infrastructure corporation.

The privatization process was initiated in 2023 and formally executed in July 2024 through a public offering of shares on Brazil's B3 and the New York Stock Exchange. The State of São Paulo reduced its equity stake from 50.3% to a minority position of 18.3%, while retaining special governance rights through a golden share mechanism. This mechanism grants the State veto power over strategic decisions, such as corporate purpose changes or asset sales. The offering raised approximately USD 3 billion for the selling shareholder.

> "With the privatization, Sabesp gained tools that it did not have as a public entity."
> Daniel Szlak, CFO

Privatization marked a turning point not only in ownership but also in institutional behavior. As a state-controlled enterprise, Sabesp had operated under public procurement rules, civil service hiring regimes, and fragmented governance. Project execution was often slow, and internal coordination across technical, financial, and community-facing teams was more difficult. The new model changed this dynamic. Following the privatization, Sabesp gained flexibility to contract based on quality and performance rather than based on the lowest price only. It restructured its procurement protocols, enabling faster procurement, disbursement, and more agile project management. As a result, the company saw a dramatic increase in execution speed. By the first quarter of 2025, Sabesp had tripled its contracted CAPEX plans compared to 2024.

The transition also brought a change in human capital strategy. Previously, all hiring followed public examination rules, which often prioritized technical credentials over soft skills or innovation potential. After the privatization, Sabesp began reassessing internal talent to propose better allocation. New hiring profiles emphasize adaptability, community engagement, and digital literacy, skills essential for delivering social infrastructure under tight timelines.

> "Sabesp was recognized for its technical expertise in the water and sewage sector. Now we want to underscore our real-world impact, such as the health conditions we contribute to improve in our communities or the rivers we clean. Sabesp is not just an infrastructure company; Sabesp promotes life and well-being."
> Samanta Souza, Executive Director of Institutional Relations and Sustainability

The partial privatization process was preceded by extensive internal restructuring. A transition team was created two years before the IPO to map procurement bottlenecks, identify legacy systems in need of reform, and benchmark corporate governance against global utilities. This included hiring legal, financial, and ESG advisors to translate regulatory obligations into actionable performance targets and investment plans.

A New Profile of Investors and Shareholders

A significant outcome of the privatization was the increase in Sabesp's investor base and the diversification of the investor profile. Today, about 80% of the free float is in the hands of international investors, while 20% is owned by Brazilian investors. Roughly 60% of the free float is owned by long-only investors, and less than 30% by hedge funds. This profile includes a larger share of long-only and international investors than most utilities in Brazil. Those investors include, in particular, ESG-oriented investors, who tend to engage with the company with more strategic, long-term discussions. Similar shifts were observed in peer companies in the water and sanitation sector, whose bond ratings have increasingly reflected governance structures and ESG transparency (Sustainable Fitch, 2024).

> "Governance matters. It gives us the ability to access more pools of capital, which translates into a more stable investor base."
> Daniel Szlak, CFO

The shift in ownership has brought new expectations around disclosure, stakeholder engagement, and impact delivery. The company's participation in sustainability indices and its commitment to publishing an impact report by 2025 were, in part, responses to these evolving expectations.

Contractual Innovation to Align Financial Performance with its Public Mission

Despite the transition to a corporation model, Sabesp's commitment to end-users and municipalities remains intact. Its new regulatory contracts under the URAE establish tariff affordability, social programs, and investment acceleration as contractual obligations.

The new contract brings several innovative differentials. First, it provides the correct incentives for a company that is expected to increase access. Rather than the typical concession model that defines a set tariff, Sabesp receives an initial tariff and increases its revenues depending on its asset base, giving it a direct incentive to invest in infrastructure. Second, recognizing that 70% of new investment is directed toward

vulnerable populations, the privatization included the creation of a new financial instrument known as the Universalization Support Fund, or FAUSP. Its main purpose is not to finance infrastructure directly but to cushion the tariff impact of universal service expansion, ensuring that affordability is preserved for low-income users. The fund is capitalized with at least 30% of the net proceeds from the privatization, along with 100% of the dividends received by the State from Sabesp over time. These resources are allocated to support measures such as the *Pró-Conexão* program, which subsidizes household sewage connections, and to uphold tariff moderation under the new contractual arrangements. This structure is defined by São Paulo State Law No. 17,853/2023, which establishes FAUSP as a mechanism to promote basic sanitation and maintain tariff affordability in the context of the company's privatization.

The social tariff paid by a household amounts to a monthly bill of USD 2, for 10 thousand liters of clean water and 10 thousand liters of treated sewage, representing a 70% discount compared to the non-subsidized tariff. Families registered on the public database *Cadastro Único* (CadÚnico)[2] are eligible for this special tariff, and the database is updated every 24 months.

Members of the communities are the main ambassadors of Sabesp to enroll new users, who are either not connected or rely on informal connections to the network.

> "In vulnerable communities, women play a key role in signing up for the service, and word-of-mouth with other women is very effective. Our goal in communities is to think holistically about how Sabesp is present before, during, and after the connection to the network."
> Samanta Souza, Executive Director of Institutional Relations and Sustainability

From Formal Compliance to Strategic Governance, including Sustainability

Before its privatization, Sabesp operated under a governance structure typical of state-owned enterprises, characterized by rigid procedures, limited cross-functional coor-

2. CadÚnico is Brazil's federal registry for low-income families. To qualify for Sabesp's Vulnerable Residential Tariff, users must have updated CadÚnico records showing a per capita family income of up to USD 39, with the account holder listed in both the utility and federal databases.

dination, and weak incentives for performance beyond compliance. Sustainability was seen primarily as a legal obligation rather than a strategic priority, and external communication was limited. The governance transformation that followed privatization enabled the company to adopt best practices in transparency, accountability, and stakeholder engagement. This included the elevation of sustainability from a programmatic function to a core element of institutional architecture.

> "Governance and sustainability are not a matter of procedures or simply being compliant. They are the engine behind everything we do."
> Karla Bertocco, Member of the Board of Directors

A significant institutional innovation was the creation of Sabesp's Sustainability Committee, established as a statutory body in the company's bylaws. Unlike ad hoc advisory groups, statutory committees derive their mandate from the shareholders' assembly, granting them legal permanence and decision-making authority. This structural difference enhances their legitimacy and ensures that their recommendations are integrated into corporate governance practices, rather than being merely consultative.

The Sustainability Committee is tasked with overseeing the integration of ESG criteria into Sabesp's strategy, operations, and reporting. It evaluates risks and opportunities related to climate change, biodiversity, water security, and social inclusion. It also monitors the development and implementation of impact metrics, the progress of materiality reviews, and the alignment of business plans with the company's long-term sustainability goals. Crucially, sustainability is now integrated into core areas such as operations and finance, and not managed in isolation.

Beyond formal structures such as the Sustainability Committee, executives emphasized the role of informal coordination networks within the company. Sustainability managers now participate in investment committee meetings and CAPEX planning sessions, an innovation that broke silos between ESG teams and operational departments. This integration has allowed Sabesp to align infrastructure delivery with broader impact goals in a more systematic way.

Until recently, Sabesp's sustainability agenda was expansive but lacked strategic focus. Across more than 600 operational units, the company managed over 100 active initiatives, many of them well-intentioned but fragmented. These ranged from environmental education programs to localized reforestation efforts and pilot projects in water reuse. Despite their individual value, these initiatives often lacked standardized impact metrics or alignment with company-wide goals. ESG was present in the company's discourse, but not embedded in planning or investment logic.

This began to change in 2024 with the creation of a dedicated Sustainability Division. Reporting directly to top management, the division was tasked with redefining how Sabesp articulates, monitors, and delivers its environmental and social commitments. The move signaled a broader shift: sustainability would no longer be managed through isolated programs or reactive compliance. It would become a structural pillar of corporate strategy.

One of the first actions led by the new division was a comprehensive review of the company's materiality matrix. After internal workshops, stakeholder mapping, and benchmarking against frameworks such as the GRI, SASB, and TCFD[3], Sabesp reduced the list of material themes from 11 to four core pillars: universal access to water and sanitation, efficient use and protection of natural resources, engagement with strategic stakeholders, and water security and resilience. These four priorities now inform the company's ESG strategy, reporting structure, and investment decision-making processes.

> "Less is more when it comes to materiality. We want more focus on our sustainability agenda, to reach more impact."
> Carlos Piani, CEO

Sabesp's shift towards a governance model centered on materiality, integration, and long-term accountability mirrors trends seen in sustainable finance. The Climate Finance Partnership, for example, emphasizes internal ESG ownership and structural governance as success factors for attracting institutional capital and delivering measurable results (OECD & UNDP, 2020). Similarly, the integration of ESG criteria throughout the investment cycle, including binding standards and board-level oversight, is recognized as a best practice among climate-aligned funds (Convergence, 2024). Sabesp's approach aligns with these international benchmarks and positions the company not only as a utility provider, but as a model of sustainability governance in emerging markets.

3. GRI (Global Reporting Initiative), SASB (Sustainability Accounting Standards Board), and TCFD (Task Force on Climate-related Financial Disclosures) are international frameworks that guide ESG reporting, with a focus on transparency, financial materiality, and climate-related risks.

Managing for Impact

Following this process, Sabesp initiated the reformulation of its performance indicators to better reflect not only technical outputs but broader environmental and social outcomes. Traditional metrics such as coverage rates, loss ratios, and CAPEX execution remain central to operational management. However, new KPIs have been introduced to capture dimensions such as greenhouse gas emissions by plant, energy efficiency in water treatment, reuse of treated effluents, and biodiversity conservation in forested areas under Sabesp's management.

According to the 2023 Sustainability Report, the company provided over 3.1 billion liters of reused water, invested more than USD 900 million in climate-related initiatives, and maintained 49,000 hectares of protected forest. Five of Sabesp's sewage treatment plants were identified as responsible for nearly 40 percent of its greenhouse gas emissions, prompting new investments in biogas generation and sludge management technologies. These initiatives are directly linked to potential credit generation under Brazil's emerging carbon market framework (Sabesp, 2024).

On the social side, programs like *Se Liga na Rede* and *Água Legal* have expanded household access to sanitation in underserved communities. In 2023 alone, over 110,000 families were connected through these initiatives. Approximately 13% of Sabesp's clients now benefit from the lowest social tariff among major Brazilian sanitation providers. These figures reflect tangible outcomes in health, gender equity, and income stability. The company has started estimating co-benefits such as reduced hospitalizations, fewer disease outbreaks, and improved household finances.

Another ongoing challenge is the company's ability to measure outcomes rather than just outputs. Installing sewage networks or expanding water coverage is essential, but does not automatically translate into improved public health, economic opportunity, or environmental resilience. To bridge this gap, Sabesp is partnering with universities and research institutes to develop methodologies that link infrastructure delivery to multidimensional impacts. These partnerships aim to inform the company's impact report.

The integration of sustainability into internal planning and performance evaluations is also evolving. Until 2023, ESG indicators were not formally incorporated into individual or departmental performance reviews. The company is now developing a model to link part of executive compensation and incentive systems to progress on ESG goals, tied to the four materiality pillars.

Ultimately, Sabesp's shift from fragmented sustainability programs to a performance-oriented impact framework is not only about transparency. It is about governance, accountability, and credibility. In an investment environment where greenwashing is under scrutiny, the company's ability to define, track, and communicate meaningful indicators will strengthen its legitimacy and deepen its access to capital.

Social Impact Programs

Universalizing sanitation is not only a technical and financial challenge. It is fundamentally about social acceptance. Infrastructure alone does not guarantee access. Trust must be built, behaviors must change, and historical inequalities must be addressed. For Sabesp, achieving universalization meant going beyond pipes and treatment plants to engage directly with the communities most affected by the lack of services. This led to the consolidation of a distinctive model of social infrastructure, centered on inclusive programs such as *Se Liga na Rede*, *Água Legal*, and, more recently, *Escola de Cria*.

Launched in 2012, *Se Liga na Rede* was Sabesp's response to a systemic obstacle in informal settlements: even when sanitation infrastructure reached the street, many families were unable to connect due to the cost of internal household renovations or lack of knowledge about the service. Before the program, average adhesion rates in newly served areas were as low as 32 percent. *Se Liga na Rede* changed this by providing full subsidies for internal plumbing adjustments, offering up to 24 months of tariff exemption, and deploying health agents to explain the benefits of joining the formal network. Importantly, these programs rely on members of the community, providing employment to them and leveraging their local networks and influence.

What began as a technical solution quickly became a platform for community transformation. The program found its most effective entry point not through engineers, but through women. Mothers, grandmothers, and daughters became the first to open their doors to field staff and to advocate for connection. In many cases, participation catalyzed broader shifts in family dynamics and income generation.

> "Some of these women used the opportunity to stabilize their households, pay off debts, and reestablish control over their family's future. It gave them visibility and sometimes even financial independence."
> Samanta Souza, Executive Director of Institutional Relations and Sustainability

The success of *Se Liga na Rede* led to the launch of *Água Legal*, a sister program focused on expanding access to safe drinking water in irregular settlements. The program operates in areas without formal land tenure and addresses both the technical and legal barriers to water provision. It integrates community mapping, stakeholder dialogue, and on-site technical adjustments to facilitate connections while respecting local realities. In 2022, *Água Legal* was recognized by the United Nations for its contribution to urban inclusion and the right to water[4].

Both programs reflect Sabesp's broader commitment to climate justice. They operate in areas where vulnerability to environmental hazards, social exclusion, and health risks converge. They also provide tangible co-benefits in terms of health, income security, and women's empowerment, dimensions increasingly recognized in inclusive infrastructure frameworks (Bosmans & de Mariz, 2023).

A new institutional structure for community engagement emerged after privatization. In 2023, Sabesp created the Directorate of Institutional Relations and Sustainability, which consolidated previously dispersed functions such as government affairs, stakeholder mapping, social impact, and communication. Unlike past models, this directorate operates with an integrated mandate, aligning community outreach with operational execution and strategic planning.

Sabesp also revived the figure of the *técnico comunitário*, local professionals who act as bridges between the company and the community. Originally developed in the 1990s and later discontinued, this role was reintroduced to enhance on-the-ground communication, conflict mediation, and adherence support. Their consistent presence strengthens the company's legitimacy in vulnerable territories and reinforces its social license to operate.

Another recent innovation is *Escola de Cria*, a training program developed in partnership with community organizations. Focused on digital communication, storytelling, and advocacy, the initiative prepares young residents of low-income neighborhoods to become local influencers and knowledge multipliers. Ten ambassadors from the program are expected to represent Sabesp at COP 30 in Belém in November 2025, reinforcing the notion that global climate conversations must include voices from the frontlines.

4. The United Nations General Assembly formally recognized the human right to water in Resolution 64/292 (2010), affirming that access to safe, clean, and affordable drinking water is essential for the full enjoyment of life and all human rights.

> "We do not build for communities. We build with them."
> Samanta Souza, Executive Director of Institutional Relations and Sustainability

This new phase of social impact strategy reflects a broader institutional learning: that community trust is not a by-product of infrastructure. It is a precondition for its success. By investing in programs that promote inclusion, equity, and local agency, Sabesp is not only accelerating universalization. It is reimagining what a water and sanitation company represents for society.

Sabesp has expanded its access to capital markets while maintaining top-tier credit ratings to sustain these programs at scale. In 2024, the company issued USD 649 million in debentures across three tranches, with maturities ranging from 7 to 15 years. These instruments are structured to match the long-term nature of water and sanitation infrastructure. Diversifying funding sources has enhanced financial resilience and positioned Sabesp as a credible issuer among investors focused on sustainable infrastructure in emerging economies.

From Development Finance to Capital Markets

Before entering ESG-labeled bond markets or structuring blended finance strategies, Sabesp was already a longstanding recipient of development finance. Over the past two decades, the company maintained close partnerships with institutions such as the International Finance Corporation (IFC), the World Bank, the Inter-American Development Bank (IDB), the Japan International Cooperation Agency (JICA), and the Brazilian Development Bank (BNDES). These relationships played a formative role in shaping Sabesp's technical standards, environmental safeguards, and governance structures, particularly during earlier cycles of infrastructure expansion.

Through these partnerships, Sabesp accessed long-term concessional credit at conditions unavailable in domestic markets. Importantly, it gained exposure to global best practices in project evaluation, environmental risk management, and stakeholder transparency. IFC-financed projects, in particular, required adherence to rigorous due diligence frameworks, including baseline social impact assessments, community engagement protocols, and third-party auditing mechanisms. This institutional discipline helped professionalize Sabesp's planning and contributed to the maturity of its internal compliance architecture (IFC, 2018).

The World Bank and IDB supported some of Sabesp's flagship initiatives, including early phases of the Tietê River depollution and major wastewater treatment plant upgrades. These projects were often accompanied by technical assistance components aimed at strengthening internal capacity in areas such as procurement, monitoring and evaluation, and climate adaptation. BNDES, in turn, became a recurring lender for smaller-scale infrastructure projects, helping Sabesp address regional needs while expanding its investment base (BNDES, 2023).

> "These partnerships taught us to look at infrastructure not only as a technical delivery, but as a social contract. That perspective is still with us today."
> Karla Bertocco, Member of the Board of Directors

The same frameworks that guided its partnerships with multilaterals (impact metrics, stakeholder engagement, and long-term planning) now inform its strategy for ESG disclosure and sustainable finance.

The company's trajectory illustrates a broader shift observed in emerging markets: development banks serve as capital providers and institutional incubators that prepare public companies for private market discipline (Attridge & Engen, 2019). This foundation helps explain why Sabesp attracted global ESG investors during its privatization and why its next challenge, blended finance, demands a similarly rigorous, structured approach.

Financing the Transition

Financing this transition demands more than market access. It requires a strategy capable of translating environmental and social value into financial access, while attracting capital that is willing to share risk and reward over the long term.

In recent years, Sabesp has explored several ways to expand and diversify its funding base. Among the most prominent was its entry into the sustainable finance market through the issuance of blue bonds. These debt instruments, certified by third-party verifiers, earmark proceeds for water-related infrastructure such as sewage networks, treatment plants, and environmental protection areas. The company's bond issuances aligned with international guidelines such as the International Capital Markets Association's (ICMA) Green Bond Principles and the IFC's blue finance framework. They were well received by investors and helped improve Sabesp's visibility in ESG-sensitive capital markets.

The practical effects of these instruments inside the company were modest, considering the long-standing relationship with sustainability-oriented multilateral organizations. The bonds provided reputation and access benefits, but did not significantly change the way the company operated, nor did they reduce the cost of capital. As a result, labelling a fixed income transaction or classifying activities was not a challenge for the company.

> "The label on our bond transaction helped us adopt the language of markets and open new doors, but it was not transformational. As a public company providing essential services, Sabesp was always very focused on sustainability."
> Karla Bertocco, Member of the Board of Directors

> "We do not see a given price benefit on labelled bonds today, we think requesting robust sustainability practices is a default option for investors. We want to focus on impact to drive additional demand and ultimately better pricing."
> Daniel Szlak, CFO

This experience mirrors broader trends in emerging markets. As noted in evaluations by the World Bank's Independent Evaluation Group, labeled bonds often lack performance incentives, credit enhancements, or structural innovation. They function more as classification tools than as transformational financing mechanisms (World Bank, 2021). Without guarantees or concessional terms, their impact on financing conditions remains limited, particularly for infrastructure sectors with long payback periods and high social externalities.

Recognizing these limitations, Sabesp began evaluating the potential of blended finance to accelerate investments in underserved areas. While no specific pilot has yet been structured, the company has expressed interest in exploring partnerships with development banks and impact investors to test co-financing strategies that combine public and private capital. However, the broader ecosystem for blended finance in Brazil remains underdeveloped. Institutional roles, return expectations, and legal frameworks are still being defined. For example, a pilot initiative led by BNDES to explore blended mechanisms in the sanitation sector has not yet materialized, highlighting the need for clearer guidance, streamlined processes, and catalytic capital to make these transactions viable. Climate Policy Initiative & Convergence (2024) noted that scaling blended finance in emerging markets requires technical innovation, regulatory clarity, and strong institutional coordination, elements still maturing in the Brazilian context.

The Brazilian Securities Commission (CVM) has not yet issued specific guidance on blended or impact finance structures, and could play a role in disseminating best practices, clarifying responsibilities, and facilitating small ticket transactions.

> "Markets would benefit from identifying existing sources of catalytic capital, including climate funds, impact investors, or blended finance."
> Rachel Sampaio, Head of Sustainability

In addition to climate-linked mechanisms, Sabesp is assessing the potential of biodiversity finance. The company manages vast areas of forest surrounding key water sources in São Paulo, with proven ecological value. Protecting and restoring these areas contributes to water security, flood prevention, and climate mitigation. With appropriate structuring, these assets could support biodiversity credits or serve as the environmental component of a future sustainability-linked instrument (OECD, 2022).

Despite these constraints, Sabesp has made progress. Its enhanced governance, more transparent and focused reporting, and use of certifications recognized by investors have enhanced its credibility in capital markets.

The path ahead will not rely on a single instrument. It will require a portfolio approach that combines traditional debt with innovative tools tied to outcomes. It will also demand internal capacity to structure projects with measurable impact, external engagement to build partnerships, and regulatory evolution to provide legal clarity and reduce transaction costs.

Sabesp's transition into sustainable finance has also required a shift in internal capabilities. While the company has extensive experience with development finance and public procurement, structuring blended or biodiversity-linked instruments demands specialized knowledge. To address this, the company launched internal training programs and created cross-functional task forces dedicated to sustainable finance innovation. These teams are now leading efforts to structure pilot transactions and engage proactively with regulators, laying the groundwork for future scaling.

Sabesp's financing strategy can benefit from financial architectures that recognize, quantify, and reward the value the company creates. From cleaner rivers to healthier communities, from reduced emissions to empowered households, these impacts are very much tangible. Treating impact as an asset and unlocking its value is the company's goal.

The Carbon Market as a mechanism to price impact

Sabesp explores emerging opportunities, particularly in connection with the Carbon Market Law, which was defined in 2024 as a high-level rule for a cap-and-trade market. The new law establishes the foundation for a regulated emissions trading system. It creates mechanisms for companies to generate, verify, and trade carbon credits based on emissions reductions. For utilities operating in high-emission sectors, this opens a new financial frontier.

Sabesp's operations are well-positioned to benefit from this framework. Internal assessments show that five wastewater treatment plants account for almost 40 percent of the company's total emissions. Upgrading these facilities with sludge-to-biogas systems and energy efficiency measures could yield significant emissions reductions, enabling the generation of carbon credits and potentially unlocking new financing channels. These facilities are now under evaluation for technological upgrades that could generate certified carbon reductions. Options include biogas recovery, sludge-to-energy conversion, and electrification of treatment systems.

Beyond carbon pricing, Sabesp's forest areas offer potential for biodiversity credits. New research highlights how natural capital, such as forested watersheds, can be monetized through mechanisms like biodiversity or combined carbon-biodiversity credits, which are increasingly sought after by impact investors (Flammer, Giroux, & Heal, 2025). These markets remain nascent but could provide alternative pathways to finance nature-based infrastructure in emerging economies.

Integrating wastewater emissions reductions into carbon markets exemplifies how utilities in the Global South are testing climate finance instruments at scale. Still, as global experience shows, the credibility of carbon offsets depends heavily on robust MRV systems (monitoring, reporting, and verification), additionality criteria, and safeguards against greenwashing (West et al., 2023). Sabesp's ability to meet these requirements will be critical for converting emissions mitigation into investable impact.

The Road Ahead

Sabesp's transformation is still in motion. Over the past two years, the company has redefined its role in Brazil's infrastructure landscape, transitioning from a publicly

managed utility to a mission-driven corporation anchored in impact and institutional discipline. Supported by the Water and Sanitation Legal Framework and its privatization, this evolution has reshaped how Sabesp finances its projects and measures success, and its internal culture, governance structure, and public positioning.

Several strategic lessons emerge from this experience. First, clarity of mission matters. By narrowing its materiality framework to four core pillars and aligning internal processes accordingly, Sabesp established a foundation for coherent communication, investor trust, and strategic alignment. Second, governance is a cornerstone of success, underpinned by integrating transversal directorates and clear mandates for statutory committees. Third, impact must be made tangible.

Sabesp is moving beyond ESG compliance into a realm where outcomes such as reduced emissions, improved health, and community empowerment are not only tracked but embedded into planning and financing. The forthcoming 2025 impact report will be a critical test in this transition. If successful, it could set a new benchmark for infrastructure companies globally.

Operational risks remain. Sabesp must continue delivering large-scale infrastructure under tight deadlines and heightened scrutiny. Delays, reputational setbacks, or failures in community engagement could jeopardize its social license and financial performance. Execution, in this sense, is as critical as ambition.

Another frontier lies in scale. Although Sabesp is one of the world's largest sanitation companies by population served, its market capitalization remains small compared to global corporations, impacted in part by a "Brazil discount". Recognizing that "São Paulo" risk differs from "Brazil" risk, considering the quality of State institutions, could strengthen the investment case. At the same time, expanding into other regions or internationally could diversify revenues, mitigate concentration risks, and increase visibility.

Sabesp's financial strategy combines operational scale with funding diversification. The company currently maintains a robust debt portfolio composed of development bank loans, government credit lines, and domestic capital market issuances (see Exhibit). Outstanding agreements with institutions such as the World Bank, IDB, and JICA exceed USD 1.5 billion and are linked to flagship projects including the Tietê River cleanup and urban water resilience. National financing partners such as BNDES and Caixa Econômica Federal (CEF) have supported over USD 1.8 billion in targeted investments, ranging from sewage expansion to energy efficiency and water reuse. This foundation has allowed Sabesp to sustain a long-term capital structure aligned with the lifespan of its infrastructure assets.

On the innovation front, new opportunities are emerging. Instruments such as biodiversity credits, climate-linked blended finance, and nature-based infrastructure could enable Sabesp to finance forest protection, watershed restoration, and emissions

mitigation at scale. Technology also holds untapped potential, from AI for leak detection to digital tools for tariff management and community engagement.

Ultimately, Sabesp's reinvention is a blueprint for how a public service company can become more agile and, at the same time, fulfill its social mission. By aligning purpose with performance, values with valuation, and community with capital, Sabesp is building something rare in the infrastructure world: a company that is both investable and transformational.

Exhibit

The table below consolidates Sabesp's main financing instruments, including concessional loans and debenture issuances. Floating rates vary across lenders and are indexed to domestic or international benchmarks. CDI refers to Brazil's interbank deposit rate, widely used as a market reference for local currency debt. TJLP was the long-term interest rate used by the BNDES before 2018. TR denotes the Referential Rate, applied to FGTS-funded loans, often combined with administrative and risk fees. International contracts are indexed to LIBOR, IDB-specific rates, or are FX-linked, reflecting foreign currency fluctuations over time.

Creditor	Description	Contract Year	Fixed Rate (%)	Floating Rate	Grace Period	Amortization Period	Amount (USD)
IFC - International Finance Corporation	Programa Novo Rio Pinheiros	2023	1.7	CDI	Up to 24 months	Up to 10 years	$175,438,596.49
IFC - International Finance Corporation	Novo Rio Pinheiros + Coastal SES/SAA + RMSP	2022	2.0	CDI	Up to 12 months	Up to 10.5 years	$133,333,333.33
IDB Invest	Tietê Project Phase IV	2023	2.5	CDI	Up to 12 months	Up to 14 years	$82,456,140.35
IDB Invest	Tietê Project Phase IV	2022	2.5	CDI	Up to 12 months	Up to 14.5 years	$82,456,140.35
IDB Invest	Water Quality Units and Solar	2020	2.7	CDI	9 months	14 years	$89,122,807.02
IDB Invest	Debt Refinancing	2020	1.9	CDI	9 months	9 years	$77,543,859.65
BNDES	PAC - Water System	2015	2.18	TJLP	36 months	204 months	$131,131,578.95
BNDES	PAC - Adduction/ Reservoir	2014	1.76	TJLP	3 years	9 years	$10,725,287.54
BNDES	Sabesp Counterpart Tietê III	2013	1.66	TJLP	3 years	12 years	$236,842,105.26
BNDES	PAC2 - Sanitation Systems	2012	1.72	TJLP	Up to 3 years	13 years	$31,718,948.53
BNDES	Onda Limpa Coastal Cities	2010	1.92	TJLP	2 years	13 years	$51,640,175.44

Creditor	Description	Contract Year	Fixed Rate (%)	Floating Rate	Grace Period	Amortization Period	Amount (USD)
Caixa FGTS	Avançar Cidades - Various	2018	6.0	TR + fees	Up to 4 years	20 years	$114,423,319.77
Caixa FGTS	Itapanhaú River Project	2017	6.0	TR + fees	22 months	20 years	$25,952,368.42
Caixa FGTS	PAC - Water & Sanitation SP/ Campinas	2014	6.0	TR + fees	Up to 4 years	20 years	$56,281,440.88
Caixa FGTS	PAC - Water & Sanitation SP Metro	2013	6.0	TR + fees	Up to 4 years	20 years	$215,635,535.44
Caixa FGTS	PAC - Small Municipalities SP	2012	6.0	TR + fees	Up to 4 years	20 years	$28,150,836.32
Caixa FGTS	PAC - Caieiras etc.	2012	6.0	TR + fees	Up to 4 years	20 years	$10,170,766.14
Caixa FGTS	PAC2 - Multiple Projects	2012	6.0	TR	4 years	20 years	$23,506,345.18
Caixa FGTS	Water & Sanitation	2008	6.0	TR	4 years	20 years	$139,002,631.58
Caixa FGTS	Water & Sanitation	2007	6.0	TR	4 years	20 years	$84,932,105.26
Caixa FGTS	Water & Sanitation	2006	6.5	TR	4 years	20 years	$9,752,189.89
Debentures	32nd Issuance	2024	3.0	CDI	Semiannual	2 years	$438,596,491.23
Debentures	31st Issuance - All Series	2024	-	CDI	Semiannual	5-10 years	$515,873,333.33

Creditor	Description	Contract Year	Fixed Rate (%)	Floating Rate	Grace Period	Amortization Period	Amount (USD)
Debentures	30th Issuance - All Series	2022	-	CDI	Semiannual	5-7 years	$175,438,596.49
IDB	Tietê River Cleanup Phase IV	2019	-	LIBOR-based	6 years	19 years	$300,000,000.00
IDB	Tietê River Cleanup Phase III	2010	-	LIBOR + spread	6 years	19 years	$600,000,000.00
IDB	Tietê River Cleanup Phase II	2000	-	IDB rate + FX	6 years	20 years	$200,000,000.00
World Bank	Sustainability & Water Services RMSP	2019	-	LIBOR + spread	10 years	19.5 years	$250,000,000.00
World Bank	Environmental Recovery - Alto Tietê	2009	-	LIBOR + FX	10 years	15 years	$100,000,000.00
JICA	Water Loss Reduction & Energy Efficiency	2012	1.7	FX-linked	7 years	18 years	$214,937,600.00
JICA	Baixada Santista Environmental Recovery II	2011	2.5	FX-linked	7 years	18 years	$122,681,600.00
JICA	Billings Watershed Environmental Program	2010	1.2	FX-linked	7 years	18 years	$39,731,200.00
JICA	Baixada Santista Recovery - Onda Limpa	2004	2.5	FX-linked	7 years	18 years	$136,448,000.00

References

1. Attridge, S., & Engen, L. (2019). Blended finance in the poorest countries: The need for a better approach. Overseas Development Institute.
2. Banco Nacional de Desenvolvimento Econômico e Social – BNDES. (2023). *Relatório Anual 2023* [Annual Report 2023]. Rio de Janeiro: BNDES.
3. Banco Nacional de Desenvolvimento Econômico e Social – BNDES. (2024). *Perspectivas do saneamento no Brasil* [Sanitation Outlook in Brazil]. Rio de Janeiro: BNDES.
4. Bosmans, P., & de Mariz, F. (2023). The blue bond market: A catalyst for ocean and water financing. Journal of Risk and Financial Management, 16(3), 184.
5. Climate Policy Initiative & Convergence. (2024). *Blended Finance for Climate: Pathways to Scale*. Climate Week Booklet.
6. Convergence. (2024). *How to Mobilize Private Capital at Scale for Climate: Lessons from Blended Finance Transactions*.
7. Flammer, C. (2021). Corporate green bonds. *Journal of Financial Economics*, 142(2), 499–516.
8. Flammer, C., Giroux, J., & Heal, G. (2025). The Social Returns to Impact-Oriented Investment. *Journal of Applied Corporate Finance*, 37(1), 54–68.
9. Independent Evaluation Group – World Bank. (2022). *World Bank Support for Public Financial and Debt Management in IDA-Eligible Countries*.
10. Instituto Trata Brasil & GO Associados. (2024). *Resumo Executivo – Ranking do Saneamento 2024* [Executive Summary – Sanitation Ranking 2024]. São Paulo: Instituto Trata Brasil.
11. International Finance Corporation – IFC. (2018). *Creating Markets for Sustainable Water and Sanitation Services*. Washington, D.C.: World Bank Group.
12. Organization for Economic Co-operation and Development – OECD. (2022). *Scaling up the use of blended finance for sustainable development in developing countries*. Paris: OECD Publishing.
13. Organization for Economic Co-operation and Development – OECD & United Nations Development Programme – UNDP. (2020). *Framework for SDG-Aligned Finance*.
14. Sustainable Fitch. (2024). *ESG Ratings of Brazilian Infrastructure: The Case of Aegea Saneamento*.
15. West, T. A., Jones, K. W., Bond, T. C., & Johnson, N. (2023). Credibility in carbon markets: Challenges for offset integrity and policy solutions. *Nature Climate Change*, 13(3), 254–261.
16. World Bank. (2021). *Water Supply and Sanitation in Brazil: Bridging the Investment Gap to Reach Universal Access*. Washington, D.C.: World Bank Group.

Vale
When a mining giant talks sustainability

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Abstract

This case study explores how Vale S.A., one of the world's largest mining companies, integrates sustainability into its corporate strategy while navigating the tensions between resource extraction and environmental stewardship in Brazil. In recent years, the company has sought to rebuild trust and redefine its role following the environmental disasters of Mariana and Brumadinho dam failures. Vale has pledged to commit to bold initiatives aligned with the UN Sustainable Development Goals (SDGs), particularly those related to responsible production, climate action, and life on land. It has also fully embraced its key role in the global energy transition by supplying minerals that are essential to it, such as high-quality iron ore, copper, and nickel. Relevant to Vale's sustainability strategy is Fundo Vale—its impact investment platform—which provides insights to understand the evolution of blended finance mechanisms in the country. Against the backdrop of Brazil's vast ecological assets and structural inequalities, the study explores how catalytic capital can be deployed to scale socio-environmental enterprises, particularly in regenerative agriculture and the forest-based bioeconomy. It analyzes two pioneering financial instruments—the Fundo Vale Belterra FIAGRO and a CRA (Agribusiness Receivables Certificate)—to illustrate the legal structures, capital layering strategies, and impact measurement frameworks that enable blended finance to function. Drawing from regulatory developments, the experiences of blended finance industry players and on-the-ground realities in land use, our analysis highlights both the potential and the friction points in mobilizing private capital for blended finance projects in Brazil.

1. How Vale makes Brazil bigger

With 64,000 direct employees, more than $38 billion in annual revenues (Brazil's GDP is $2.17 trillion), and holding the position of second biggest iron ore producer globally, Vale is a Brazilian giant.

Vale was established in 1942 to explore iron ore as a result of war alliances. That year, Brazil had agreed to join the Allies in WWII, and as a consequential favor, through the Washington Agreement, the USA provided Brazil with financial assistance to establish the National Steel Company or Companhia Siderúrgica Nacional - CSN. CSN was meant to be Brazil's big bet on steel production, an initiative aligned with then President Getúlio Vargas' efforts to industrialize the country. Vale was then created specifically to supply high-quality iron ore for CSN's steel production.

Together, Vale and CSN put Brazil firmly on the global map of iron production. Fifty years later, the South American country had already become the second-largest producer of iron ore in the world. In the new historical context, the government concluded that it was the time for private initiative to conduct its future. In 1993, CSN was privatized and, in 1997, it was Vale's turn. The government sold 41.73% of the company's shares for $3.1 billion at the time[1]. The winning bid came from a consortium led by CSN, which acquired a 16.3% stake, along with other investors such as Litel Participações (10.43%), Eletron S/A (10%), and Sweet River (5%). For reference on prices, Vale had reported a $339 million net income in 1995[2].

Vale benefits from Brazil's rich mineral reserves. Under the Brazilian Constitution, the state owns all subsoil "resources; therefore, in order to" obtain the right to exploit mineral deposits, Vale must go through a non-competitive concession process and pay mining royalties established by Brazil's National Mining Agency. These royalties are charged through a fee known as "Financial Compensation for the Exploitation of Mineral Resources" (CFEM), which is calculated as a percentage of the company's gross revenue from the sale of the extracted minerals.

1. Folha de S.Paulo. (1997, May 7). *Vale is sold for R$ 3.3 billion with a 20% premium.* https://www1.folha.uol.com.br/fsp/brasil/fc070513.htm

2. Folha de S.Paulo. (1996, February 17). *Privatization of Vale would yield R$ 5.4 billion today*. Retrieved from https://www1.folha.uol.com.br/fsp/1996/2/17/brasil/29.html. BRL converted to USD considering BRL 0.9706 = 1 USD, as per https://fred.stlouisfed.org/series/DEXBZUS#.

Today, Vale is the second-largest iron ore producer globally with 327.7 million metric tons[3] produced in 2024 (~20% of transoceanic market)[4], closely following Australian Rio Tinto's 328.0 million metric tons[5]. Vale is also the largest global producer of iron ore pellets (37 million metric tons). The company also accumulates the title of the 6th biggest producer of nickel globally, with nearly 160,000 metric tons produced. It is a significant copper producer, with an annual output of 348,000 metric tons, and has leading positions in the manganese and cobalt markets. Vale plays a crucial role in Brazil's economy thanks to its contributions to exports, employment, and government revenues. In 2024, the mining titan achieved $38.1 billion in net operating revenue and paid $5.4 billion in taxes in the jurisdictions where it operates[6].

Vale operates across 18 countries, with 90% of its workforce based in Brazil. In its homeland, the company is structured in three main systems: the Northern System (including Carajás and the Ponta da Madeira port), the Southeastern System and Southern System (centered around the Iron Quadrangle region in Minas Gerais and ports like Tubarão, Itaguaí and Guaíba). Internationally, Vale has a significant presence in Canada, with six underground mines, as well as exploration activities in Chile, Peru, and Indonesia, besides further operations in the UK, Oman, Malaysia and Japan. It has established offices in strategic countries like China, India, the U.S., and Australia[7].

Some of this international expansion was powered by acquisitions. In 2006, Vale acquired Canadian mining company Inco Limited for $20 billion for its nickel and copper mines as well as its processing power[8]. Vale owns an Indonesian

3. Vale S.A. (2025, March). *Institutional Presentation*. Available at: https://vale.com/en/announcements-results-presentations-and-reports#comunicados-relevantes

4. Vale is responsible for about 20% of all iron ore that is transported by sea globally. Vale S.A. (2025, March). *Institutional Presentation*. Available at: https://vale.com/en/announcements-results-presentations-and-reports#comunicados-relevantes. Vale S.A. (2025). *Integrated Report 2024*. Available at: https://vale.com/en/announcements-results-presentations-and-reports#comunicados-relevantes

5. Rio Tinto. (2025, January 16). *Rio Tinto releases fourth quarter production results*. https://www.riotinto.com/en/news/releases/2025/rio-tinto-releases-fourth-quarter-production-results

6. Vale S.A. (2025, March). *Institutional Presentation*. Available at: https://vale.com/en/announcements-results-presentations-and-reports#comunicados-relevantes. Vale S.A. (2025). *Integrated Report 2024*. Available at: https://vale.com/en/announcements-results-presentations-and-reports#comunicados-relevantes

7. Vale S.A. (2025). *Integrated Report 2024*. Page 8. Accessed on: May 18, 2025.

8. Bloomberg News. (2006, October 24). *Vale Buys Control of Canadian Nickel Miner Inco*. Retrieved from https://www.bloomberg.com/news/articles/2006-10-24/vale-buys-control-of-canadian-nickel-miner-inco

subsidiary focused on nickel production and hydro-powered High-Pressure Acid Leaching, the process for producing hydroxide precipitate, which, along with rare earth minerals, is a key component of batteries[9].

Vale is a publicly traded corporation since 1970 and has shares listed on the Novo Mercado segment of the São Paulo Stock Exchange (B3), as well as on the New York Stock Exchange (NYSE) and the Madrid Stock Exchange (Latibex).

2. Vale's Sustainability strategy is core to its operations

With such large operations, capitalization, and geographic distribution, Vale can have a large positive impact for Brazil and globally, through wealth generation and fiscal contributions, supporting energy transition by supplying critical minerals, and caring for territories where it is located and its communities. As a large mining company, Vale's activities can also have a negative impact. Aware of that, Vale is leading a series of initiatives to minimize negative impact and strengthen its social license to operate, by firming up commitments related to the Sustainable Development Goals (SDGs).

> "*Sustainability is a central theme in Vale's strategy; it is Vale's competitive advantage, because Vale is able to produce the highest quality iron ore in the world, which means it is the best option for a lower carbon steel, as higher ore concentrations demand less energy for steel production*". Marcelo Bacci, Vale's Executive VP of Finance and Investor Relations.

Because steel and cement are high volume hard to abate industries, the world's migration to iron ore products with high quality is central to the world's decarbonization goals. Achieving a low-carbon economy requires rebuilding the world's existing infrastructure—a transformation that depends on minerals and metals. Vale has taken up the mission to provide the world with them.

The company's iron ore products and subproducts service the steel industry, which in turn fuels the construction industry. Vale expects that the metals

9. Reuters. (2024, March 18). *Indonesia says nickel miner Vale to build another $2 bln HPAL plant*. Retrieved from https://www.reuters.com/markets/commodities/indonesia-says-nickel-miner-vale-build-another-2-bln-hpal-plant-2024-03-18/

it produces, especially nickel and copper, will foster the energy transition economy, in burgeoning industries such as electric mobility, grid electrification, and renewable infrastructure, mainly because they are central to conduce and transmit energy. In order to accelerate strategic next steps for these energy transition products, Vale has established a new special division named Vale Base Metals, which is now central to Vale's organic growth strategy.

> "*It is Vale's social mission to support the production of high-quality iron ore and other minerals to facilitate the energy transition*". *(...) Brazil has a huge endowment of minerals. Looking ahead, we are focused on the organic growth of mining in the country, leveraging this natural endowment. Carajás, the mine in southeastern Pará, is extremely rich in minerals — especially copper, a key metal for energy transition. We are developing the 'New Carajás' initiative to further unlock this potential*". Marcelo Bacci.[10]

2.1. Carbon emissions and the role of innovation

One of Vale's core sustainability strategies is the reduction of carbon emissions.

The company aims to reduce its Scope 1 and 2 emissions by 33% by 2030 and reach net zero by 2050 for scope 1 and 2. The baseline was 10.5 MtCO2e in 2017 and, by the end of 2024, emissions were already down by 26.9%. For Scope 3 emissions, the most difficult one that includes value chain emissions, Vale targets a 15% reduction goal by 2035. The 2018 baseline was 528.4 MtCO2e, and in 2024 Vale had already reduced those in 13.2%[11].

Technology and innovation are critical to meet those goals. As a way to address emissions, Vale has just developed a cold-agglomeration briquetting technology that allows for the processing of richer iron ore briquettes[12] without the need for

10. *"The Novo Carajás program foresees investments of USD 13 billion by 2030 to expand iron ore and copper operations in the Carajás complex, in Pará. In addition to boosting mineral production, Novo Carajás focuses on circular economy practices in mining, using innovative technologies and dry processing methods. This initiative aims to help position Vale and Brazil as leaders in the supply of critical minerals."* Vale S.A. (2025). *Integrated Report 2024*. Page 4. Available at: https://vale.com/pt/comunicados-resultados-apresentacoes-e-relatorios#apresentacoes

11. Vale S.A. (2025). *Integrated Report 2024*. Page 13. Available at: https://vale.com/en/announcements-results-presentations-and-reports#comunicados-relevantes

12. Vale S.A. (2025, March). *Institutional Presentation*. Page 14. Available at: https://vale.com/en/announcements-results-presentations-and-reports#comunicados-relevantes. Vale S.A. (2025). *Integrated Report 2024*. Page 64. Available at: https://vale.com/en/announcements-results-presentations-and-reports#comunicados-relevantes

energy-intensive sintering. The briquettes have the same application that Vale's pellets have (blast furnaces and direct reduction furnaces), but they're higher in quality (with more concentration of ore), allowing for steel producers to use less energy resources in the steel production. These briquettes thus mean a significant reduction of fuel consumption, direct carbon dioxide emissions, sulfur oxides (SOx) emissions, nitrogen oxides (NOx) emissions, and particulate matter (PM) emissions when compared to pellet production, contributing to improved air quality and the mitigation of environmental impacts.

The technology is generating so much excitement that it was selected by the U.S. Department of Energy to receive funding under the Bipartisan Infrastructure Law and the Inflation Reduction Act, as part of the Industrial Demonstrations Program.

Vale's first batch of new briquettes was produced in 2024, and they are already at the center of several promising partnerships[13]. In early 2024, Vale signed a Memorandum of Understanding (MoU) with Hydnum Steel for the construction of an iron ore briquette plant within Hydnum Steel's flagship green steel project in Puertollano, Spain. The plant will use new technology designed to replace fossil fuels with green hydrogen, contributing to the decarbonization of the steel sector. The initial production capacity is expected to reach 1.5 million tons of rolled steel by 2026, with a projected increase to 2.6 million tons per year by 2030.

Another partnership was established with Green Energy Park (GEP) to conduct feasibility studies for the installation of a green hydrogen production facility in Brazil. The aim is for this facility to supply a future Mega Hub—an industrial complex dedicated to the production of low-carbon steel products in the country. The partnership could create an open platform for international agreements, enabling global steel companies to acquire and produce hot-briquetted iron (HBI) in Brazil and accelerate the decarbonization of the steel industry.

Vale's briquettes demonstrate that many of the technologies needed to tackle the energy transition are already available, being developed by companies committed to investing in R&D to produce these greener solutions. Those greener products currently have a higher price. Therefore, financial incentives will be critical to boost demand, whether through carbon taxes or cap-and-trade systems, to make these products viable for producers to invest in.

13. Vale S.A. (2025). *Integrated Report 2024*. Page 71. Available at: https://vale.com/en/announcements-results-presentations-and-reports#comunicados-relevantes

> *"If you don't create financial mechanisms to reward lower emissions and only depend on the end customer's willingness to pay for a more expensive but greener product, it will be very hard to fuel the transition at the pace that is needed."* Marcelo Bacci.

2.2. Use of natural resources

Vale committed globally to 100% renewable electricity consumption by 2030, and it has already achieved the mark of 84.3%. In its own country, that goal was reached even earlier: having tackled the challenge in 2025, as of today, Vale operates on 100% renewable energy in Brazil[14]. In fact, Vale has 3.26 GW of installed capacity in hydroelectric, wind, and solar generation assets in Brazil and Canada. It's worth mentioning that Brazil has a cleaner grid than most countries, with 87% of the electricity coming from renewable sources and 48% of the total energy matrix coming from renewables[15].

Vale set a 2017 baseline and committed to reducing freshwater use by 27% by 2030, with an emphasis on operations in regions facing high water stress. As of 2024, the company reports a 31% reduction compared to that baseline[16].

2.3. Territories, forests and communities

Vale operates in some of Brazil's most remote and biodiverse regions, including areas of dense forest and traditional communities such as Indigenous peoples, quilombolas and others. This positioning gives the company the meaningful opportunity and the decisive responsibility to help protect both natural ecosystems and their dwellers.

One striking example of development acting in harmony with nature is Carajás, where Vale began operations in 1985. Satellite imagery today shows that the forest within Vale's fenced areas remains intact, while the surrounding, unprotected regions have experienced significant deforestation. Protecting the forests

14. Vale S.A. (2025). *Integrated Report 2024*. Page 13. Available at: https://vale.com/en/announcements-results-presentations-and-reports#comunicados-relevantes

15. EPE (Empresa de Pesquisa Energética) and MME (Ministério de Minas e Energia). 2024. *Plano Decenal de Expansão de Energia 2034*, page 507. Brasília: EPE/MME. Accessed May 18, 2025. https://www.epe.gov.br/pt/publicacoes-dados-abertos/publicacoes/Plano-Decenal-de-Expansao-de-Energia-PDE

16. Vale S.A. (2025). *Integrated Report 2024*. Page 13 and 14. Available at: https://vale.com/en/announcements-results-presentations-and-reports#comunicados-relevantes

is an opportunity that Vale—with its power and scale—has to mitigate its negative impacts on the environment and amplify its positive ones, reinforcing its social license to operate.

Traditional communities play a leading role in protecting these forests, acting as frontline guardians of these critical ecosystems. Many of today's forest preservation initiatives focus on empowering these communities, recognizing that supporting their traditional ways of life is key to ensuring the continued protection of these regions.

Today, Vale protects 975 thousand hectares of preserved area in total, including 787 thousand hectares in the Amazon and 188 thousand hectares protected in partnership with Conservation Units (UCs) and REDD+ projects[17]. Starting in 2019, Vale pledged to recover and protect 500,000 hectares of forests beyond their operational footprint by 2030[18].

Looking ahead, the company plans to scale up reforestation efforts in partnership with other companies that are close to the forestry sector. In 2022, together with pulp and paper Suzano, Itaú Unibanco, Marfrig, Rabobank and Santander, Vale created Biomas, a Brazilian ecological restoration company. The company was incorporated with the mission to restore, conserve, and preserve 4 million hectares of native forest across critical Brazilian biomes such as the Amazon, Atlantic Forest, and Cerrado over the next 20 years.[19]

Biomas operates through a nature-based carbon credit business model. By implementing large-scale restoration projects, Biomas generates high-integrity carbon credits aligned with international standards.

These credits are then sold to companies seeking to offset their emissions and meet sustainability goals.

Its first large-scale initiative, the Muçununga Project in southern Bahia, involves the reforestation of 1,200 hectares of the Atlantic Forest, with an investment of roughly $10 million and an estimated yield of 500,000 carbon credits over 40 years.[20] Vale has a 17% stake in Biomas, and Vale's intention is for any profits to be reinvested into the company. The goal is not to generate economic profit

17. Vale S.A. (2025). *Integrated Report 2024*. Page 8 and 9. Available at: https://vale.com/en/announcements-results-presentations-and-reports#comunicados-relevantes

18. Vale S.A. (2025). *Integrated Report 2024*. Page 13. Available at: https://vale.com/en/announcements-results-presentations-and-reports#comunicados-relevantes

19. Biomas. n.d. *Home*. Accessed May 18, 2025. https://www.biomas.com/en

20. Biomas. n.d. *Home*. Accessed May 18, 2025. https://www.biomas.com/en

from this stake, but rather to contribute capital, human resources, and expertise to ensure the project's success[21].

Also, Vale, through its Vale Cultural Institute, is one of the largest investor in cultural initiatives in Brazil[22]. Much of this support is made possible through a legal tax incentive that allows corporations to allocate a portion of their income tax payments to fund cultural projects.

2.4. Disaster response and dams safety

Vale has stepped up its efforts to make health and safety one of its key priorities, especially the improvement of operational safety through technological innovation in mining and metallurgy. This strategic shift not only enhances operational safety but also aligns with the company's broader vision of the future of the steel industry, which is seen as increasingly shaped by regional hubs in Europe, the U.S., China, and Japan.

Vale has committed to ensuring that no tailings dam remains in a critical safety condition (emergency level 3) by the end of 2025. In parallel, the company is working to implement the Global Industry Standard on Tailings Management (GISTM) across all of its tailings storage facilities. Focusing on upstream structures in Brazil, the company reports that 57% (17 out of 30 dams) have been decommissioned as of 2025, with a full target set for 2035[23].

This commitment is part of Vale's preventive response to the severe industrial disasters of Brumadinho and Mariana, both involving tailings dam failures at mines operated or co-owned by Vale. In Mariana in 2015, the Fundão dam managed by Samarco (a Vale and BHP joint venture) collapsed releasing over 40 million cubic meters of tailings. The disaster killed 19 people, destroyed entire communities, and caused long-term environmental damage across hundreds of kilometers of rivers and land. In Brumadinho in 2019, a tailings dam at Vale's Córrego do Feijão mine failed, resulting in 270 deaths and massive destruction.

21. Suzano. (2022, November 16). *Itaú Unibanco, Marfrig, Rabobank, Santander, Suzano and Vale unite to restore, conserve and preserve 4 million hectares of native forest in Brazil*. Retrieved from https://www.suzano.com.br/news/itau-unibanco-marfrig-rabobank-santander-suzano-and-vale-unite-to-restore-conserve-and-preserve-4-million-hectares-of-native-forest-in-brazil

22. Vale S.A. (2025). *Integrated Report 2024*. Page 75. Available at: https://vale.com/en/announcements-results-presentations-and-reports#comunicados-relevantes

23. Vale S.A. (2025). *Integrated Report 2024*. Page 15 and 47. Available at: https://vale.com/en/announcements-results-presentations-and-reports#comunicados-relevantes

On the mitigation part of Vale's response to those disasters, the company is closing agreements with the relevant authorities. For Mariana, the agreement reached in 2024 includes BRL 38 billion already disbursed across 42 compensation programs, BRL 100 billion in financial obligations to be paid over 20 years, and BRL 32 billion in obligations to be executed by Samarco, Vale's subsidiary in charge of the dam[24].

2.5. ITV - Instituto Tecnológico Vale, Belém

Vale Institute of Technology (ITV), located in Belém, Pará is an institute at the cutting edge of applying science and technology to support biodiversity research and forest conservation in the Amazon. One of its key projects involves decoding the genomes of native plant species, highlighting the immense value of standing forests—not only for environmental reasons, but also for their potential as sources of raw materials for pharmaceuticals.

In addition to biodiversity research, ITV is helping to finance reforestation efforts linked to sustainable cocoa production, offering both ecological and economic benefits to local communities. The institute is also developing advanced safety and monitoring tools, including an early-warning system capable of predicting forest fires in the Amazon. These innovations reinforce Vale's resolution to protect the Amazon and affirm the forest's value beyond resource extraction[25].

3. Fundo Vale

Fundo Vale is a Brazilian impact investment and business promotion fund established by Vale in 2009. Although one could mistake it for an investment fund, Fundo Vale was actually structured under the legal framework of a non-profit civil association. Yet it's true that, just like an investment fund, Fundo Vale operates as a pool of capital to promote impactful businesses.

24. Vale S.A. (2025). *Integrated Report 2024*. Page 105. Available at: https://vale.com/en/announcements-results-presentations-and-reports#comunicados-relevantes

25. Vale Institute of Technology. (2023). *Activity Report – Sustainable Development*. Retrieved from https://www.itv.org/wp-content/uploads/2024/06/Ebook.RelatorioAtividadesITV.2023.ing_.pdf

> *"Fundo Vale is a nonprofit organization within a mining company. It functions as a financial mechanism in partnership with other development institutions, such as BNDES, to address issues that philanthropy alone would not be able to solve."* Gustavo Luz, Director of Fundo Vale.

Fundo Vale's mission is to foster a fairer, more sustainable and inclusive economy by supporting socio-environmental impact businesses and initiatives with catalytic capital. The fund operates primarily in Brazil, with a special focus on the Amazon region, aligning its activities with Vale's sustainability and voluntary social investment strategy.

> *"Fundo Vale works with additionality, focusing on thematic rather than territorial approaches. From the beginning, Fundo Vale has focused on reforestation and the bioeconomy."* Gustavo Luz.

Fundo Vale not only supports impact businesses with financial capital, but also contributes proprietary resources and extensive expertise in collaboration with Vale. This non-financial support includes sharing native seedling nursery infrastructure—used for collecting seeds and seedlings—with civil society organizations and impact-driven enterprises; organizing the Vale Impact Network[26], a recently built initiative through which, in 2024, over 70 employees provided free mentorship to businesses supported by Fundo Vale in programs like Jornada Amazônia; producing and distributing informational materials on sustainability, such as the "*Technical Report: Overview of the International Carbon Market*"[27], as well as publications focused on impact businesses, like "*Agroforestry Carbon Businesses*"[28]; and supporting the Carbon Research Center (CCARBON) at ESALQ/USP.

Over 15 years, Fundo Vale's investments sum up to more than $75 million. The contribution of resources to Fundo Vale is done by Vale in an early basis, with these contributions scaling in recent years – from 2020 to 2024 alone the fund received roughly $65 million. The fund has supported 146 initiatives and accel-

26. FUNDO VALE. Engagement that transforms: Fundo Vale boosts sustainable businesses through a collaborative network. Published on Feb. 10, 2025. Available at: https://www.fundovale.org/espaco-do-conhecimento/ultimas-noticias/engajamento-que-transforma-fundo-vale-potencializa-negocios-sustentaveis-com-rede-colaborativa/. Accessed on: May 20, 2025.

27. Available at fundovale.org/wp-content/uploads/2022/10/Relatorio_MercadoCarbono-FV-Ecosecurities_set22.pdf

28. Available at https://www.fundovale.org/download/estudo-negocios-de-carbono-agroflorestal/

erated 660 impact-driven ventures. Their efforts have benefited 60,000 people directly and indirectly, including rural producers, extractivists, and their families, in collaboration with 91 partners. In alignment with Vale's 2030 Forest Goal, the fund has contributed to restoring more than 18,000 hectares and protecting over 200,000 hectares of habitat, which has benefited more than 4,000 people through sustainable systems[29].

Fundo Vale envisions evolving from a philanthropic venture builder into a scale-up platform. In this transformation, new ventures that rely on its sponsorship will mature into established companies that go beyond requiring philanthropic support, as they will eventually become viable targets for profit-driven investment.

Under this vision, each invested venture would follow a three-phase plan. In the initial investment phase in a new business, Fundo Vale engages in traditional philanthropy by providing seed funding and grants to incubate startups that are in the prototyping phase, and hopefully lead them until they can secure their first contracts and attract co-investors. The second phase involves adopting a venture philanthropy approach using blended finance. Here, Fundo Vale would assume investment roles that include participation in subordinated structures, first-loss positions in blended finance mechanisms, offtaking and financial de-risking, accepting concessionary returns but recovering the principal capital invested. Finally, in the scale-up phase, the sponsored companies should be in a position to generate meaningful profits. Vale will continue to partner with them, this time not through Fundo Vale, but through other sustainable investment vehicles targeting non concessionary returns.

Fundo Vale employs a patient, catalytic, and flexible capital approach, operating across a spectrum that can range from philanthropic resources up to impact finance and blended finance mechanisms with private capital returns.

29. Fundo Vale. (2024). *2023 Performance Report*. Retrieved from https://www.fundovale.org/relatoriodeperformance/en/

3.1. Fundo Vale's Portfolio of Financial Support Strategies

3.1.1. Philanthropic grantmaking

Fundo Vale's "Fomento" strategy focuses on providing non-reimbursable funding to support the development of socio-environmental impact businesses. This includes capacity building, business creation and acceleration, prototyping financial solutions, strengthening social organizations, and producing knowledge—all aimed at fostering a more inclusive and sustainable economy.

One example of venture under this initiative is be Caaporá, an early-stage reforestation initiative focused on agroforestry and sustainable land use in Brazil.[30]

Under the grantmaking program, Fundo Vale launched in 2020 the Bioeconomy Strategy, which emphasizes long-term support for sustainable production initiatives, particularly in the Amazon. This strategy seeks to enhance socio-biodiversity value chains and promote a regenerative, forest-based economy through partnerships and innovation.

Notable initiatives under this strategy include:

- AMAZ Impact Accelerator: Established by Idesam, AMAZ is dedicated to entrepreneurs operating in the Amazon. It has invested approximately R$ 6.8 million in 11 ventures, offering support in financial management, logistics, and market access, utilizing a blended finance model that combines philanthropic and repayable investments. [31]

- Jornada Amazônia Platform: Created by Fundação Certi, this initiative aims to develop the Amazon's bioeconomy by fostering innovation ecosystems. It supports the growth of startups focused on sustainable forest economies, with backing from institutions like Bradesco, Itaú Unibanco, Santander, CLUA, and Fundo Vale. [32]

Another initiative is Sustenta.Bio ("Sustain.Bio"), structured in collaboration between Fundo Vale and the Chico Mendes Institute for Biodiversity

30. Fundo Vale. (2024, June 6). *Caaporá and Belterra start new partnership cycles with Fundo Vale*. Retrieved from https://www.fundovale.org/en/espaco-do-conhecimento/ultimas-noticias/caapora-and-belterra-start-new-partnership-cycles-with-fundo-vale/

31. AMAZ. (2024). *About AMAZ – Impact Accelerator*. Retrieved from http://amaz.org.br/

32. Fundação CERTI. (2024). *Amazon Journey*. Retrieved from https://jornadaamazonia.org.br/

Conservation (ICMBio), aimed at strengthening socio-biodiversity economies within Brazil's Amazon region. Launched in 2023, the program focuses on enhancing sustainable value chains in 14 Conservation Units and one Indigenous Territory across the states of Amazonas and Pará.

With an initial investment of $4.5 million, Sustenta.Bio supports extractivist organizations, cooperatives, and traditional communities by providing technical assistance, infrastructure improvements, and market access for regional products such as açaí, Brazil nuts, pirarucu fish, babaçu, and vegetable oils. The program also emphasizes community governance, aiming to improve decision-making processes and attract further investment.

To date, Sustenta.Bio has covered 14 Conservation Units in the states of Amazonas and Pará, helping protect 10 million hectares of forests. The program collaborates with six co-executing organizations and 32 partner entities for the sustainable use of forest natural resources, such as Brazil nuts, açaí, pirarucu, timber, babaçu, and vegetable oils. The project aims to add value to products through improved hygiene standards, training, increased sales, and market awareness of the socio-environmental value of community production. Meanwhile, the Vale Technological Institute (ITV) is contributing to this production chain by conducting genetic mapping of the pirarucu.

An example is the community-based management of the pirarucu production chain and the collection of seeds and forest products in the Médio Juruá and Uacari extractive reserves in Amazonas, led by the Association of Rural Producers of Carauari (Asproc). The project promotes the protection and sustainable use of natural resources, aligning deforestation reduction, biodiversity conservation, and the well-being of traditional populations with an efficient community-based management model. In the Médio Juruá region, about 2,000 people live off managed pirarucu fishing, family farming, and the collection of oilseeds, açaí, and other extractive activities. [33]

3.1.2. Catalytic capital

Fundo Vale's Catalytic Capital strategy is designed to support socio-environmental impact businesses through patient, flexible, and catalytic funding. This approach spans from giving philanthropic grants to bearing the first loss in impact investment mechanisms. This strategy also includes customized financing, non-financial support, impact measurement and management, and knowledge sharing with supported businesses.

> *"Our goal is to have the flexibility to deploy capital according to the needs of the project — not the other way around."* Gustavo Luz.

A central component of this strategy is the implementation of blended finance models, which combine philanthropic and impact investment capital from various sources, including corporations, multilateral agencies, traditional investors, and governments. Blended finance can be defined as *"the strategic use of public as well as philanthropic capital for the mobilization of additional external private commercial finance for SDG-related investments"* (Blended Finance Booklet, 2024). This hybrid financing approach allows for a better balance between risk, return, and impact, particularly suited for socio-environmental impact businesses. Since 2017, Fundo Vale has been exploring these hybrid financial mechanisms and made its first repayable investments in 2020.

The long-term goal of this strategy is to scale innovative financial solutions that can unlock additional resources and overcome current financing barriers faced by socio-environmental impact businesses. Resource allocation within this strategy is guided by impact ecosystem parameters and emphasizes robust impact management and measurement processes. Sections 4 and 5 will analyze two examples of this investment approach. [34]

3.2. Measuring Impact is core to Fundo Vale's strategy

To measure the impact of its initiatives, Fundo Vale and Vale co-developed GIMPACT, a proprietary impact measurement and management framework inspired by the SDGs and comparable to IRIS+. It is designed to assess, monitor, and communicate the social and environmental impact of the initiatives supported by Fundo Vale. Created in alignment with the organization's Theory of Change 2030 and Vale's sustainability commitments, GIMPACT offers a robust and adaptable system tailored to Brazil's socio-environmental context and the specificities of impact-driven enterprises.

The primary goals of GIMPACT are to: (i) Evaluate the socio-environmental contributions of projects and businesses; (ii) Support strategic decision-making through reliable, data-backed insights; (iii) Track progress toward long-term goals,

33. Fundo Vale. (2024). *Sustain.Bio*. Retrieved from https://www.fundovale.org/sustenta-bio/

34. Fundo Vale. (2025). *Catalytic Capital*. Retrieved from https://www.fundovale.org/portfolio/capitalcatalitico/

such as habitat restoration, carbon neutrality, and inclusive economic development; (iv) Contribute to ecosystem strengthening by offering a replicable and transparent impact assessment model.

GIMPACT directly supports the implementation of Fundo Vale's strategic agenda and Vale's climate and social investment strategies, reinforcing a culture of accountability and learning within the impact portfolio. GIMPACT is structured around an impact pathway model, based on the Theory of Change. It connects inputs and activities to short-, medium-, and long-term outcomes and impacts. The framework integrates the following elements:

- Quantitative indicators (e.g., hectares of land restored, individuals impacted, jobs created)
- Qualitative assessment dimensions (e.g., empowerment, community engagement, resilience)
- Alignment with Sustainable Development Goals (SDGs)
- Customizable logic models tailored to each project or initiative

These components allow for a comprehensive and strategic evaluation that not only measures outputs but also analyzes the broader transformation generated by the interventions.

While GIMPACT draws inspiration from international impact measurement standards, its core value lies in its contextualization to the Brazilian and Amazonian reality. It addresses a critical gap by offering a framework that is both rigorous and sensitive to the specific socio-environmental dynamics of the region—particularly in areas that are vulnerable, remote, and challenging to monitor with conventional tools. [35]

4. Supporting regenerative agriculture

One example of Blended Finance use by Fundo Vale is the structuring and investment in "*Fundo Vale Belterra Fiagro de Direitos Creditórios*", constituted with the goal of restoring up to 4,000 hectares of degraded land.

35. Fundo Vale. (2022). *Impact Measurement and Management: GIMPACT*. Retrieved from https://www.fundovale.org/wp-content/uploads/2022/06/01_MaterialGuiaGimpact_ING-1.pdf

4.1. The legal structuring

A FIAGRO ("*Fundo de Investimento nas Cadeias Produtivas Agroindustriais*", Agribusiness chains Investment Fund) is a type of investment fund in Brazil instituted in 2021. It allows investors to pool resources and invest in various assets related to the agricultural value chain, such as rural properties, agricultural receivables, equity in agribusiness companies, and other financial instruments tied to agribusiness operations.

In Fundo Vale's particular case, the fund falls into a subdivision called "Fiagro FIDC", with FIDC standing for receivables investment fund. This regime allows the fund to invest in agricultural receivables, for example, *CPRs* (Rural Product Notes). Therefore, it has a fixed income-like amortization profile. FIDCs also allow for a layered capital structure with different subordination levels (tranches) with different amortization, return and guarantees profiles, making it a very good solution for pulling in different kinds of capital for blended finance instruments[36].

Fundo Vale committed to the Fiagro the whole subordinated tranche in the amount of $5.5 mm, and other $18 mm are expected to come from the senior tranche[37]. The Fiagro is then to buy Rural Product Notes issued by Belterra Agroflorestas, a company working with producers and focused on regenerative agriculture.

4.2. How can land *actually* be restored in Brazil

As complicated as financial instruments might seem with their alphabet of acronyms, they are actually the easier part of the sustainable investment equation. Beyond the earmarking of financial resources, to understand the real impact Fundo Vale wants to have in the currently degraded lands of Brazil, it is necessary to get to know the Brazilian context and the invested company, Belterra and its Theory of Change.[38]

Brazilian forests have historically been damaged for extraction of timber, lang grabbing and for the expansion of monocultures. This is akin to colonial times, as the first ever product to be exported from Brazil at scale was Pau-Brasil, a red-col-

36. Fundo Vale Belterra FIAGRO – Direitos Creditórios – Responsabilidade Limitada. *Regulamento do Fundo Vale Belterra FIAGRO – Direitos Creditórios – Responsabilidade Limitada* [Bylaws of the Vale Belterra FIAGRO Fund – Credit Rights – Limited Liability] (translated from Portuguese). Dated February 6, 2024. Accessed May 18, 2025. https://data.anbima.com.br/fundos/S0000748986/sobre-o-fundo.

37. Current BRL amounts are converted to USD considering 1 USD = 5.5 BRL.

38. See: https://www.belterra.com.br/_files/ugd/9a3408_ea729b12addd437d93c6d6c48b1d61be.pdf for Belterra's Theory of Change.

ored timber that was mainly used to tint clothes and ultimately gave its name to the country. When European settlements in Brazil started in 1530, Brazil became the nest for sugarcane production, in huge monocultural plantation systems that depended on deforestation and degraded the land quickly. The third commodity cycle took place in the 18th century with the production of coffee, leading to the degradation of a huge part of the biome known as Atlantic Forest.

Today, the Brazilian Forest Code stands as one of the most restrictive globally, and 66% of the national territory is covered with forests. Illegal deforestation and other illegal activities remain a key problem, with law enforcement lacking adequate means. Traditional communities who inhabit those regions can be their best protection, as their well-being depend on a healthy ecosystem and their traditional knowledge allows for a sustainable use of resources. Large companies, which depend on strict environmental licenses and a social license to operate, also represent an ally to protect forests.

Because small farmers play such a huge role in keeping the forest safe, Belterra believes that the best way to protect the forest and rebuild degraded areas is to empower farmers with the tools to seed and build agroforestry agricultural systems, and to profit from the crops. Unlike conventional agriculture systems, which often involve monocultures and deforestation, agroforestry mimics natural forest structures that integrate trees and shrubs with a diverse set of crops. The crops are carefully placed in a way that allows them to benefit from each other, for example banana trees, with their faster growth cycle, would shade the terrain and give back to the soil organic material, while manioc gives a quick return to farmers and cocoa grows to give its first crop after three years. The specific set of crops is defined by analyzing the soil's need for regeneration as well as providing a complementary stream of revenues or food to farmers.

Belterra partners with farmers and landowners to analyze their properties soil and, considering regional characteristics, interaction between species and commercial interest of the farmers, they help implementing a mix of crops out of 34 types. The most common crops with commercial value used are cocoa, manioc, cupuaçu, açaí, peach palm, cassava, and banana.

Belterra can either work with farmers solely as an advisor, helping identify the ideal crop mix for a given piece of land and supplying seedlings; or lease the farmers' properties and directly conduct agroforestry operations. Belterra prefers to focus primarily on the first model, not only because the second requires higher capital expenditures, but more importantly because the company does not want to contribute to further land consolidation. They believe Brazil already faces a serious issue with excessive land ownership concentration. For reference, agricultural

establishments larger than 200 hectares represent just 0.8% of all farms in Brazil, yet occupy 41% of the land[39].

Yet, because Brazil has many properties dedicated to low-productivity livestock farming – summing up to an area as big as a medium sized European country -, Belterra does implement the second model as a way to add value to nature by converting these properties into agroforestry systems. Typically, they would take 3 to 6 months negotiate land-use agreements, they then begin by restoring the soil with lime and fertilizer, and finally start planting short-cycle species that help recompose the exposed soil in December (in the Amazon biome). Within one year, they are able to harvest faster-growing crops, and by year four, cocoa reaches peak productivity, which is a crucial milestone for the operation's breakeven, as cocoa is currently the highest-value product in this system.

For each leased property, Belterra pays the landowners monthly and also invests in seedlings and the implementation of the agroforestry system. Beyond farms, Belterra also needs to invest in operational hubs and logistics. Most of the funding received through financing structures goes toward these types of costs.

This agroforestry system can generate carbon credits. In fact, in 2024, Belterra submitted a reforestation carbon project (ARR)[40] to Verra, covering an initial area of 2,134 hectares—60% of which are in the Amazon biome (in the states of Pará, Rondônia, and Mato Grosso), with the remaining portion located in the Atlantic Forest biome (Bahia). The project is seeking recognition for a sequestration rate of roughly 8.1 tCO_2e/ha/year. Belterra's agroforestry model is designed to break even without relying on carbon credits, but these credits can serve as guarantees for loans and boost financial returns. This is because, while securing long-term offtake agreements for crops is difficult, it is comparatively easier for carbon credits. Such contracts are often better suited to meet the long-term guarantee requirements demanded by investors - a historic challenge in financing small-scale farms.

Belterra currently operates in the states of Pará (Polo Transamazônica, Polo Carajás, and Polo Xingu), Mato Grosso (Polo Alta Floresta), Rondônia (Polo Ponta do Abunã), Bahia, and Minas Gerais (Polo Presidente Olegário). To date, they have secured 78 agreements with farmers, helping to establish 5,000 hectares of agroforestry[41].

39. EMBRAPA – BRAZILIAN AGRICULTURAL RESEARCH CORPORATION. *Land Tenure Situation – Sisal Territory*. [n.d.]. Available at: https://www.embrapa.br/agencia-de-informacao-tecnologica/territorios/territorio-sisal/caracteristicas-do-territorio/situacao-fundiaria. Accessed on: May 18, 2025.

40. Verra. *Project VCS 5006*. Retrieved from https://registry.verra.org/app/projectDetail/VCS/5006

41. Belterra Agroflorestas. (n.d.). *Who we are*. Retrieved from https://www.belterra.com.br/

Before getting to work, Belterra conduces documental analysis—including land deed, CAR (Rural Environmental Registry), CCIR (Certificate of Rural Property Registration), ITR (Rural Land Tax)—and geographic analysis, considering topography, altitude, slope, and susceptibility to flooding or landslides. This analysis is key to ensure that they are fueling farmers that are legally established on their land. In Brazil, especially in the countryside, this is particularly important because historically the real estate registrars were established in an unorganized way, that allowed some part of the land to formally belong to more than one landowner.

4.3. Investing under a clear regulatory regime

The structured Fiagro has its resources clearly earmarked - they are to be allocated in "*Belterra projects focused on land restoration through agroforestry systems, promoting environmental preservation and the sustainable production of agricultural commodities*". The fund's bylaws also specifically mentioned that one of the fund's objectives is to generate positive social and environmental impact. Such bylaws also include provisions for the hiring of second-opinion assessments to verify socio-environmental performance and alignment with impact goals, including those aligned with the capital markets association - ANBIMA guidelines.

In terms of monitoring, fund managers will oversee not only financial performance but also the impact of the projects. The investment committee establishes KPIs to assess the project's progress, including the number of seedlings planted, socio-environmental due diligence, and purchases of sustainable machinery. Disclosure of ESG-related information and risks is also planned for quarterly reports and other public-facing materials.

Overall, according to its bylaws, the three overarching objectives and requirements of the fund are: environmental, through the restoration of degraded land and the promotion of sustainable agriculture; social, by generating positive impact in local communities; and governance, by adopting transparency policies, investment committees, and independent evaluations. These commitments will enable the fund to be classified as a sustainable or impact fund, as certified by independent assessments.

These provisions are written in the bylaws and therefore drive the fund's manager investment activities. Both funds and fund managers are regulated in Brazil by the Securities and Exchange Comission (CVM) and subject to auto-regulations by Anbima. Both CVM and Anbima have some suggestive guidelines about rules and processes that funds with sustainable claims should incorporate.

According to Article 49 of CVM Resolution No. 175, any investment fund or share class whose name includes references to ESG factors must meet specific disclosure and governance requirements. The fund's bylaws must clearly define: (i) the expected environmental, social, or governance benefits and how the investment policy aims to generate them; (ii) the methodologies, principles, or guidelines used to qualify the fund or share class as sustainable; (iii) any entity responsible for certification or providing a second-party opinion, including details about its independence from the fund; and (iv) the format, content, and frequency of ESG performance reports, as well as the identification of the party responsible for preparing those reports.[42]

Under Anbima's ruling, Sustainable Investment Funds (referred to as "IS" funds) are held to the highest standard, as their core purpose is to promote sustainability. Their bylaws must explicitly state this purpose, and all strategies must not have material negative impact. These funds must implement ESG methodologies, acknowledge data and methodological limitations, carry out due diligence, and engage with corporate governance in line with sustainability goals. Transparency is paramount: all objectives, methodologies, and monitoring tools must be disclosed, and even the fund name must reflect its sustainable nature[43].

In contrast, funds that integrate ESG issues without declaring sustainability as a formal objective are still obligated to explain how ESG factors influence their decision-making. These funds must document their integration methodology, address data limitations, and may maintain engagement policies. They can communicate ESG integration in their materials only if all integration standards are properly met.

Managers also have some obligations regardless of fund type. These include having a formal ESG or sustainability policy, a dedicated governance structure with qualified professionals, and ensuring that all disclosures are accurate, updated, and detailed to prevent greenwashing.

4.4. The Fund's Journey – or Odyssey

Although the fund's bylaws were officially released at the end of 2023, Fundo Vale Belterra FIAGRO remains only partially capitalized, as the senior tranche is still seeking a buyer with appetite for market risk.

One of the main challenges in this search is that investors typically require tangible real asset collateral to secure their capital. However, given the nature of agroforestry businesses, suitable guarantees are limited. The land cannot be easily used as collateral because it does not belong to Belterra and, even if it did, the cost of regenerating the

42. CVM. *Resolution No. 175, Article 49*, issued December 23, 2022.

43. ANBIMA. (2021). *ESG Guide II – ESG Aspects for Managers and Investment Funds*. Retrieved from https://www.anbima.com.br/data/files/08/E7/AC/BC/8B5418105 6C3B2186B2BA2A8/ESG_Guide_II.pdf

land exceeds its market value. Offtake agreements for crops are also difficult to arrange — particularly for cocoa, the fund's most valuable product — as it takes three years to mature, which would require a buyer willing to contract.

To address this issue, Belterra is operationalizing a different form of concessional capital: a foreigner development finance institution (DFI) that would guarantee 80% of the senior tranche principal in the event of default. Belterra has tested this structure with market investors, who have responded much more positively to the significantly de-risked profile provided by this guarantee.

> "*There is a lack of maturity in the domestic financial market, not only in terms of financial structuring but also in the business models for regenerative agriculture. International investors tend to have more climate-focused funds and show deeper engagement.*" Valmir Gabriel Ortega, Partner at Belterra Agroflorestas.

The fund received three key forms of external validation. First, ERM-SITAWI issued a Second Party Opinion on the fund's sustainability impact. Second, the rating agency Liberum prepared a rating report for the senior quotas. Third, a Legal Opinion was provided by a highly reputable Brazilian law firm, confirming the legal soundness of the structure.

This Legal Opinion was, in fact, a requirement from the DFI, which had concerns about the robustness of the Brazilian legal framework for this type of structure. While these forms of validation are important for the growth of such an innovative market, they come at a cost. The challenge is that the additional requirements — including rigorous due diligence and multiple third-party assessments — significantly increase the operational expenses of the financial structure. And many of these costs are fixed fees, which end up consuming a large portion of the total capital raised, especially for smaller funds.

The senior quotas may be sourced as soon as 3Q2025, when the DFI that will issue the guarantee is expected to finalize analyzing these three new opinions and do their in-person due diligence.

4.5. The potential

Once the structure is fully implemented, the project is expected to help restore 4,000 hectares of degraded land in the Atlantic Forest and the Amazon, supported by an initial investment of approximately $23.5 million. On this basis, Fundo Vale's catalytic capital of $5.5 million would achieve a leverage multiplier of 3.3x.

Based on the project's restoration capacity, an estimated 545,000 tons of carbon are expected to be sequestered over ten years. In addition, the labor-intensive nature of the initiative is projected to generate hundreds of direct jobs.

The same structure can also be used to source and deploy additional capital in future follow-on funding rounds. Given the vast areas of degraded land resulting from low-productivity livestock farming, Brazil certainly has no shortage of land suitable for allocating this type of investment.

> "*Brazil has 80 to 90 million hectares of degraded land — the equivalent of one and a half times the size of Germany. While there are land ownership issues in Brazil, land availability is not a barrier. There is potential to scale any production chain without deforestation. Compared to other countries, land-use trade-offs between food production, energy generation, and forest conservation are less of a problem in Brazil.*" Valmir Gabriel Ortega, Partner at Belterra Agroflorestas.

5. Financing the Bioeconomy

Another example of Fundo Vale using blended finance to support bioeconomy is the investment in the "*Certificado de Recebíveis do Agronegócio*" (CRA) issued in December of 2022 to support Belterra's agroforestry investment again, but also to support small extractivist producers through a network of cooperatives that partner with Conexsus.

5.1. The legal structuring

The "*Certificado de Recebíveis do Agronegócio*" (Agribusiness receivables note) is a widely used financial instrument in Brazil. CRAs are very popular even among individual investors, since, as a measure to boost the agribusiness sector, the government instituted in 2004 income tax exemption on earnings (interest and capital gains) for individuals investing in CRAs[44].

Under Brazilian law, a CRA has its resource allocation very specifically earmarked at its issuance, and the management of the assets and liabilities related to it is done by a securitization company that acts in fiduciary duty to investors. In this case, the chosen partner for the operation was Gaia Securitizadora—a securitization company

44. B3 – Brasil, Bolsa, Balcão. (n.d.). *Certificado de Recebíveis do Agronegócio*. Retrieved May 16, 2025, from https://www.b3.com.br/pt_br/produtos-e-servicos/negociacao/renda-fixa/certificado-de-recebiveis-do-agronegocio.htm

that abandoned its "business as usual" client portfolio three years ago to become a sustainable-only business securitization company.

Even though the CRA is unlike the Fiagro FIDC in that it is not an investment fund, it still shares some of the interesting tools that enable blended finance, for it allows different investors to receive different returns, maturity dates, and amortization profiles for their investments through different *tranches*. Another benefit of this type of instrument is that the subordinated tranches can serve as a type of guarantee for the senior tranches due to the amortization payment waterfall structure. The most senior tranche is paid first, which means that in the event of a partial default, there's a good chance that the senior tranche can still be entirely repaid, even if the subordinated tranches are not.

In this case, the issuance was organized into four tranches. The most junior one, with the most concessional capital, was the Junior Subordinated tranche. It offered just 0.5% annual interest—far below Brazil's basic interest rates (that was 11.75% p.y. at the time of the Issuance and is now 14.75% p.y. as of May 2025[45]) and even below inflation, which was 4.83% then and is now 5.53%.[46] This tranche amounted to roughly $400,000 and was invested by Belterra using concessionary capital granted to Belterra by another NGO, the Good Energies Foundation.

The second tranche of concessional capital was contributed by Fundo Vale, amounting to $800,000 and targeting a return of 8.5% per annum. Although this is still considered concessional—since it is below Brazil's basic interest rates—it exceeds the inflation rate.

After the private capital was also sourced, the resources were invested in the supported small companies and cooperatives through the acquisition of *CPRs* (Rural Product Notes) issued by them. From the total $3.4 million initial invested amount, $2 million were allocated to Belterra's agroforestry system (the implementation of 350 hectares of agroforests and the construction of seedling nurseries in Parauapebas, Pará), and $1.4 million were allocated to the cooperatives linked to Conexsus.

CRAs can also allow for revolvability, that is, the CPRs can have shorter terms than the maturity of the CRA, and, upon the Securitization company's approval,

45. Banco Central do Brasil. (2025, May 7). *Copom increases the Selic rate to 14.75% p.a.* Retrieved from https://www.bcb.gov.br/en

46. Instituto Brasileiro de Geografia e Estatística (IBGE). (2025, January 10). *IPCA hits 0.52% in December and has cumulative increase of 4.83% in 2024*. Retrieved from https://agenciadenoticias.ibge.gov.br/en/agencia-news/2184-news-agency/news/42428-ipca-hits-0-52-in-december-and-has-cumulative-increase-of-4-83-in-2024

the repayment funds can be reused for granting credit to new CPRs issued by either new or old producers. So, as of now, the initial $3.4 million has already fueled $4.2 million in loans[47].

Summary of the CRA Investment Characteristics
Characteristics of the Emission

- Issuance: 34th issuance by *Gaia Impacto Securitizadora S.A.*
- Issuance date: December 29, 2022
- Type of securities: CRA – Certificados de Recebíveis do Agronegócio.
- Underlying assets: Diversified agribusiness credits (CRAs backed by CPR-F and CCB)
- Governing law: Law No. 11.076/2004, Law No. 14.430/2022, and CVM Resolution No. 60/2021.
- Series: Four tranches, as summary below[48]:

Summary of CRA tranches	Maturity Date	Amount (USD)	Amount (BRL)	Remuneration
CRA Senior I	05/29/2025	1,946,737	10,000,000	100% DI + 2.1% p.a.
CRA Senior II	06/29/2025	194,674	1,000,000	13.65% p.a.
CRA Subordinated Mezzanine	10/29/2025	778,695	4,000,000	8.5% p.a.
CRA Subordinated Junior	12/29/2025	389,347	2,000,000	0.5% p.a.

Main Players and Their Roles

- **Gaia Impacto Securitizadora S.A.**
- Role: **Issuer (Emissora)**
- Responsible for issuing the CRA and acquiring eligible agribusiness receivables.
- **FRAM Capital DTVM S.A.**
- Role: **Trustee Agent (Agente Fiduciário)**
- Represents the interests of CRA holders.

47. GRUPO GAIA. CRA Amazônia and Biomas | Issuances and Operations. [n.d.]. Available at: https://emissoes.grupogaia.com.br/conexus/. Accessed on: May 17, 2025. See next page for our summary of conditions.

48. BRL converted to USD considering BRL 5.1368 = 1 USD in December 23, 2022, as per https://fred.stlouisfed.org/series/DEXBZUS#.

- **Conexsus**
- Role: **Original creditor and arranger**
- Initially held the agribusiness receivables, later transferred to the Issuer.
- **Banco Santander (Brasil) S.A.**
- Role: **Lead Coordinator (Coordenador Líder)**
- Intermediated the public offering of the CRA.
- Vórtx DTVM Ltda.
- Role: **Custodian and Settlement Agent**
- Handled custody and settlement operations.

SOURCE: Organized by the author based on the 9th amendment to the CRA's Securitization Term. [49]

5.2. How to support small extractivists

The CRA benefited 36 cooperatives and 3 small firms, resulting in roughly 4,500 small extractivists having access to cheaper financial resources. The loans ranged from $6,000 to $93,000, with interest rates of 12.7% per year for most producers. These cooperatives were sourced by the Institute for Sustainable Connections ("Conexsus") [50].

Conexsus is an NGO that fosters an ecosystem of cooperatives and small businesses with socio-environmental impact that are willing to work for the conservation of forests and biomes. It supports over 220 cooperatives through Impact Finance, Business Development, and Market Access. Historically, Conexsus has helped these producers by providing financial resources at very low (or even zero) costs through its impact finance platform and has seen very low delinquency rates from these loans, given that it also provides technical support for the good use of the money. Through the CRA, they were able to professionalize the way these resources were lent and also expand their impact.

Conexsus firmly believes that these kinds of cooperatives, associations, and small businesses focused on family farming and extractivism are essential for the conservation of natural resources, cultural heritage, and threatened biomes such as the Amazon, the Cerrado, and the Caatinga, because they improve land use and help prevent deforestation and pressure on natural resources exactly by being present on-site, since their livelihoods depend on keeping the forest intact. Cooperatives supported by Conexsus play an important role in smoothing the dynamics of crop prices and assisting individual extractivists and producers by ensuring they receive fair prices for their production. Despite the significance of their role, these cooperatives often lack professional financial practices, with many lacking access to working capital.

The cooperatives supported by the CRA are involved in the production, processing, or trade of a diverse range of crops, including pequi, Brazil nut, beans, horticultural products, cereals, legumes, seeds, flowers, açaí, coffee, corn, fruits, oilseeds, and rice, with the majority of them in the cocoa chain. The cooperatives are distributed across several regions in Brazil, including Cerrado, Pará, Bahia, Mato Grosso, Rio de Janeiro, Minas Gerais, Paraná, Rio Grande do Sul, and Amapá.

The resources provided to them made a major difference: they allowed cooperatives to pay producers upfront—at times even above market rates—and empowered them in better negotiations with off-takers. Additionally, these funds enabled one-off but impactful investments, such as investing in certifications and labels for organic products and purchasing machinery. This financial support was paired with Conexsus' guidance on how to manage funds effectively, creating a positive feedback loop that led to impressively low delinquency rates. In fact, the current delinquency rate for their working capital operations is very close to zero, which also results from the past financial relationships that Conexsus already had with all the selected extractivists.

Entities Issuing CPRs under the CRA Structure	Nominal Value (USD)	Issuance Date	Maturity Date	Interest	Purpose
Cooperativa Central do Cerrado Ltda.	39,129.42	10/2/2022	12/23/2023	12.68% a.a.	Agroindustry with dryer and press for production of Baru nut, Pequi pulp, Babassu oil, and Pequi oil
Belterra Agroflorestas Ltda.	195,647.10	9/26/2022	11/23/2025	Greater of (i) 100% DI + 1.0% a.a. or (ii) 11.50% a.a.	Fertilizers and pesticides for production of cocoa, banana, and cassava
Belterra Agroflorestas Ltda.	1,822,872.99	12/22/2022	12/25/2025	Greater of (i) 100% DI - 0.967% a.a. or (ii) 11.50% a.a.	Fertilizers and pesticides for production of cocoa, banana, and cassava

49. GRUPO GAIA. *CRA Amazônia and Biomas | Issuances and Operations*. [n.d.]. Available at: https://emissoes.grupogaia.com.br/conexus/. Accessed on: May 17, 2025

50. GRUPO GAIA. CRA Amazônia and Biomas | Issuances and Operations. [n.d.]. Available at: https://emissoes.grupogaia.com.br/conexus/. See next two pages for our summary of the invested assets.

Entities Issuing CPRs under the CRA Structure	Nominal Value (USD)	Issuance Date	Maturity Date	Interest	Purpose
Federação UNICAFES MG	147,925.88	8/1/2022	8/25/2024	12.68% a.a.	Agroindustry with dryer, selector, and coffee packaging
Cooperativa Agricola Resistência de Cametá Ltda. - CART	16,840.25	9/29/2022	11/23/2023	12.68% a.a.	Agroindustry with dryer and press for açaí production
Cooperativa Agropecuária Mista Regional de Irecê - COPIRECÊ	39,129.42	12/22/2022	1/23/2024	12.68% a.a.	Agroindustry with sugarcane milling and corn production
Cooperativa dos Agricultores do Vale do Amanhecer - COOPAVAM	78,258.84	12/22/2022	9/23/2023	12.68% a.a.	Agroindustry for organic Brazil nut and oil production
Cooperativa dos Agricultores do Vale do Amanhecer - COOPAVAM	78,258.84	12/23/2022	8/23/2023	12.68% a.a.	Agroindustry for organic Brazil nut and oil production
Cooperativa Ecológica de Agricultores e Artesões da Região Serrana - ECO SERRA	19,564.71	9/27/2022	12/23/2023	12.68% a.a.	Agroindustry for beans with dryer and packager
Cooperativa Ecológica de Agricultores e Artesões da Região Serrana - ECO SERRA	15,651.77	12/22/2022	1/23/2024	12.68% a.a.	Agroindustry for beans with dryer and packager

Entities Issuing CPRs under the CRA Structure	Nominal Value (USD)	Issuance Date	Maturity Date	Interest	Purpose
Cooperativa Camponesa Central de Minas Gerais - CONCENTRA MG	34,406.88	9/29/2022	12/23/2023	12.68% a.a.	Agroindustry for coffee with dryer and press
Cooperativa da Agricultura Familiar e Economia Solidária da Bacia do Rio Salgado e Adjacências - COOPFESBA	15,126.93	9/27/2022	6/23/2024	12.68% a.a.	Agroindustry for fine chocolate production
Cooperativa de Produção Agropecuária Vitória - COPAVI	19,564.71	10/3/2022	12/23/2024	12.68% a.a.	Agroindustry with sugarcane milling and packaging
Cooperativa União Familiar - COPRAUF	29,160.86	9/27/2022	12/23/2024	12.68% a.a.	Agroindustry for minimally processed foods and transport
Cooperativa dos Produtores Orgânicos de Reforma Agrária de Viamão - COPERAV	136,952.97	12/22/2022	1/23/2025	12.68% a.a.	Agroindustry for organic rice using dryer and rice mill
Cooperativa Regional de Industrialização e Comercialização Dolcimar Luiz Brunetto	19,564.71	12/22/2022	8/23/2023	12.68% a.a.	Agroindustry with bean dryer and packaging

Entities Issuing CPRs under the CRA Structure	Nominal Value (USD)	Issuance Date	Maturity Date	Interest	Purpose
Cooperação Agropecuária Vida Natural - COOPERNATURAL	48,911.77	12/22/2022	7/23/2024	12.68% a.a.	Agroindustry for sorting and packaging of beans
Cooperativa Alternativa Mista dos Pequenos Produtores do Alto Xingu - CAMPPAX	40,486.97	5/26/2023	10/25/2023	14.5% a.a.	Wholesale of cocoa, fruits, cereals, legumes, and flowers
Fernandes Oleos Essenciais Ltda.	29,347.06	9/27/2022	12/23/2023	12.68% a.a.	Agroindustry with press for Poejo oil production
Cooperativa dos Agricultores Familiares e Agroextrativistas Grande Sertão Ltda.	43,042.36	12/22/2022	1/23/2024	12.68% a.a.	Agroindustry with press for Pequi oil production
Cooperativa dos Agricultores Familiares e Agroextrativistas Grande Sertão Ltda.	15,651.77	12/22/2022	12/23/2023	12.68% a.a.	Agroindustry with press for Pequi oil production
Cooperativa Agroindustrial de Produção e Comercialização Conquista - COPACON	58,694.13	9/27/2022	7/23/2023	12.68% a.a.	Agroindustry with grain sorter, mill, and packaging of non-GMO corn

Entities Issuing CPRs under the CRA Structure	Nominal Value (USD)	Issuance Date	Maturity Date	Interest	Purpose
COOPEMAPI - Cooperativa dos Apicultores e Agricultores Familiares do Norte de Minas Gerais	58,154.49	9/27/2022	12/23/2024	12.68% a.a.	Honey production with honey house, centrifuge, and packaging
COPERAV - Cooperativa dos Produtores Orgânicos de Reforma Agrária de Viamão	58,694.13	9/27/2022	12/23/2023	12.68% a.a.	Agroindustry with rice mill, dryer, and packaging for organic rice
Cooperativa Regional de Base na Agricultura Familiar e Extrativismo Ltda. – COPABASE	19,564.71	9/27/2022	12/23/2023	12.68% a.a.	Agroindustry for minimally processed Brazil nut supported by trucks
Cooperativa dos Agricultores de Porto Vera Cruz Ltda. – COOPOVEC	5,869.41	10/3/2022	12/23/2024	12.68% a.a.	Agroindustry for minimally processed horticultural products
Cooperativa de Seringueiros de Ouro Branco – COOPSOB	29,347.06	12/23/2022	8/23/2023	12.68% a.a.	Natural rubber processing with truck and coagulation equipment
Associação do Centro de Tecnologia Alternativa – CTA	20,542.95	12/22/2022	1/23/2024	12.68% a.a.	Fruit pulp production with cleaning equipment and truck

Entities Issuing CPRs under the CRA Structure	Nominal Value (USD)	Issuance Date	Maturity Date	Interest	Purpose
UNICAFES MG (Federação de Cooperativas de Agricultura Familiar - MG)	97,823.55	12/22/2022	1/23/2024	12.68% a.a.	Agroindustry with dryer, selector, and coffee packaging
FECAFES Paraná	33,260.01	12/23/2022	1/23/2025	12.68% a.a.	Banana production with truck and food-cleaning equipment
COOPEMAPI (Cooperativa dos Apicultores e Agricultores Familiares do Norte de Minas Gerais)	21,384.27	10/18/2021	9/23/2023	6.17% a.a.	Apiculture with centrifuge-equipped honey house
CAMPPAX (Coop. Alternativa Mista dos Pequenos Produtores do Alto Xingu)	91,095.69	5/5/2023	10/23/2023	14.5% a.a.	Wholesale trade in cocoa, fruits, cereals, legumes, seeds, and flowers
Cooperativa Alternativa Mista dos Pequenos Produtores do Alto Xingu – CAMPPAX	65,594.10	4/6/2023	10/25/2023	14.5% a.a.	Cocoa, horticultural products, cereals, legumes, seeds, and flowers trade
Cooperativa Alternativa Mista dos Pequenos Produtores do Alto Xingu – CAMPPAX	30,696.52	4/20/2023	10/25/2023	14.5% a.a.	Cocoa, horticultural products, cereals, legumes, seeds, and flowers trade

Entities Issuing CPRs under the CRA Structure	Nominal Value (USD)	Issuance Date	Maturity Date	Interest	Purpose
100% Amazônia Exportação e Representação Ltda.	52,292.67	2/24/2022	12/23/2023	6.17% a.a.	Plants, seeds, and flowers trade
Cooperativa Mista dos Produtores e Extrativistas do Rio Iratapuru - COMARU	41,431.32	4/6/2023	9/25/2023	14.5% a.a.	Collection of oilseeds and the manufacturing of agricultural products.
Mercado Orgânico Brasil Companhia Digital Ltda.	64,767.25	9/12/2023	8/23/2024	15.41% a.a.	Agricultural trade and food products (fresh and processed), seeds, and beverages, including online and retail sales
Cooperativa de Ribeirinhos Extrativistas Agroindustrial do Marajó	59,833.10	9/12/2023	12/22/2023	12.68% a.a.	Açaí cultivation, honey production, seedling nurseries, non-timber forest product extraction
Cooperativa Ecológica de Agricultores e Artesões da Região Serrana – ECO SERRA	43,097.32	9/25/2023	12/23/2024	12.68% a.a.	Agroindustry with bean dryer and packaging
Cooperativa dos Produtores Orgânicos de Reforma Agrária de Viamão – COPERAV	100,191.79	9/25/2023	12/22/2023	12.68% a.a.	Agroindustry with rice mill, dryer, and packaging equipment for organic rice

Entities Issuing CPRs under the CRA Structure	Nominal Value (USD)	Issuance Date	Maturity Date	Interest	Purpose
Cooperativa de Seringueiros de Ouro Branco – COOPSOB	31,021.77	12/5/2023	8/23/2024	12.68% a.a.	Natural rubber activities with truck and coagulation equipment
Cooperativa dos Agricultores Familiares e Agroextrativistas Grande Sertão Ltda.	63,770.33	12/5/2023	12/23/2024	12.68% a.a.	Agroindustry with press for Pequi oil production
Cooperativa Ecológica de Agricultores e Artesões da Região Serrana – ECO SERRA	28,978.30	12/15/2023	12/23/2024	12.68% a.a.	Agroindustry with dryer and packaging for bean production
Cooperativa dos Agricultores do Vale do Amanhecer – COOPAVAM	125,351.46	12/15/2023	9/23/2024	12.68% a.a.	Agroindustry with sorting equipment for organic Brazil nut and Brazil nut oil production

5.3. Sourcing private capital

Once the concessional capital for the operation was secured, the structuring companies began a roadshow that ended up taking much longer than expected—but it turned into a valuable learning experience.

They discovered that, while institutional investors are interested in sustainable investment instruments, there remains a steep learning curve before they feel confident enough to commit capital to such structures. One of the most common concerns was reputational risk: investors feared potential backlash if their sustainable investments later faced transparency or performance issues related to sustainability claims. At the same time, because the funds were being directed to cooperatives that are often informally managed, lack robust accounting practices, and are not

fully professionalized, there was a structural mismatch. These organizations struggled to meet the rigorous due diligence standards typically required by capital markets.

In addition to that, institutional investors often don't have credit risk teams prepared to analyze smaller operations in crops that are less common in markets. Investment professionals understand the cycles of major Brazilian plantation products, such as sugarcane, coffee, and soy. But they don't have analysts dedicated to understanding the production cycles and risks of these smaller, first-extract crops, such as seasonality, harvest cycles, price fluctuations, logistics, flooding, rain, occurrence of wildfires and biological conditions that span across different biomes. Due to their lack of knowledge, they tend to be more conservative when analyzing these operations, therefore making it harder to approve them. Their teams also lack the multidisciplinary knowledge required to evaluate both blended finance structures and the expected outputs of this type of crops and they generally were not given realistic parameters for discount rates to strike the right trade-off between impact and targeted return on capital. It was therefore painfully hard to get the CRAs analyzed by the different institutional investors' committees.

Another concern was that, since the extractivist activities take place in forested areas, there must be strict compliance regarding their exact location, especially to ensure there is no overlap with Indigenous reserves or other protected territories. As discussed before, in Brazil's countryside land regularization is a major issue due to historically unprofessional practices in real estate registry systems. As a result, investors required that detailed geoprocessing data for all farms involved were to be presented to verify that there was no encroachment on Indigenous lands and to prove the integrity and boundaries of the properties.

Another major challenge is that investors are accustomed to requesting guarantees, such as receivables from off-take contracts or mortgages on high-value land as collateral. However, this isn't applicable to the type of land involved in extractivism, which generally lacks the liquidity or formal valuation investors expect. And, while the subordinated structure of the CRA does function somewhat like a guarantee due to its waterfall amortization preferences, it doesn't fully cover the principal risk.

After six months and dozens of roadshow meetings, the structuring team finally secured a single investor genuinely interested in allocating capital to this kind of structure: the Spanish bank Santander, which has extensive operations in Brazil and a pledged commitment to sustainability targets. In that case, support from the top management was key.

The agreed-upon return for Santander investment in the most senior tranche was 100% of the CDI (Brazil's basic interest rate) plus 2.1% per year. This yield is below what would be expected for a standard market transaction, especially considering the

absence of guarantees. In this sense, Santander's roughly $2 million capital was effectively a hybrid between concessionary and purely market-based capital. To complement the missing part of the transaction, Gaia, the securitization company, invested roughly $200,000 in the second most senior tranche, for an expected return very close to Brazil's basic interest rate. Catalytic capital attracted 1.4x worth of market-based capital.

> *"Banks have a credit process with a well-established and standard format. But when it comes to agroforestry, such a model doesn't exist. This creates divided responsibility: the ESG team wants to support the project for its impact, while the credit team is also interested but lacks the tools to properly evaluate it. Due diligence for a sustainable investment sets a higher bar than for a standard one. When a project is labeled as sustainable, investors expect the structurers to demonstrate that it is absolutely pristine, as they perceive that the reputational risk could be significant."* Marcelo Ângelo Pereti, Chief Financial Officer of Belterra Agroflorestas.

6. Tailwinds from above: Regulation and momentum in Brazil's Blended Finance industry

The Brazilian Securities and Exchange Commission (CVM) is closely monitoring the development of the blended finance industry and is committed to seeing the agenda succeed.

> *"The sustainability agenda, when introduced in a non-intrusive way and aligned with the capital markets, can create opportunities in the green economy and sustainable finance segments. It can help attract more issuers in this space and more investors, including foreign ones, and expand the size of the capital markets."* João Pedro Barroso do Nascimento, President of CVM[51]

51. João Pedro Barroso do Nascimento is the author of several articles on the topic such as: https://www.revistari.com.br/278/2160 and https://www.conjur.com.br/2024-out-01/a-resolucao-cvm-193-e-a-adocao-das-normas-de-divulgacao-de-informacoes-de-sustentabilidade/

CVM is also prepared to promote integrity in the market, which is reflected in CVM Resolution 175 on Investment Funds[52], with measures for closer supervision of funds that claim to be ESG or green and to ensure the integrity of the assets that are brought into the fund. CVM participates in international forums and national labs to discuss blended finance and praises international collaboration.

> *"There is a global integration underway with three major building blocks: taxonomy, reporting, and assurance[53]. Brazil is leading by being the first country in the Global South to formally include sustainability reporting in its regulation aligned with IOSCO."* João Pedro Barroso do Nascimento, President of CVM

To address the challenge of foreign investors having difficulty understanding Brazilian regulations, something highlighted in Fundo Vale's Fiagro, CVM also intends to release educational materials using accessible language to explain the parameters of blended finance and the applicable regulatory framework.

The Brazilian Congress, particularly in the area of fiscal policy, has historically worked with CVM to promote certain industries through the capital markets. Brazil currently offers tax exemptions for investments in certain sectors, depending on the type of investor. For example, individual investors are eligible for tax exemptions in Infrastructure Funds, Real Estate Funds, and CRAs. One possible approach would be to extend similar tax incentives to high-impact investments. It's also worth noting that blended finance structures are currently largely inaccessible to individual investors.

However, Brazil does have a key player in the blended finance space. The Brazilian Development Bank (BNDES) is a federal public company linked to the Ministry of Development, Industry, Trade and Services. It is Brazil's main development finance institution, created to foster long-term investments that promote sustainable economic and social development. Historically, BNDES has been a leader in infrastructure finance and has recently stepped up its activities in blended finance through public calls for proposals[54] that invite players and proj-

52. CVM. *Resolution No. 175*. Annex I recognizes carbon credits as financial assets and outlines integrity responsibilities. Annex VI allows investments in agricultural carbon credits. Available at: https://conteudo.cvm.gov.br/legislacao/resolucoes/resol175.html

53. João Pedro Nascimento. "*Building a sustainable ecosystem: the Building Blocks of green finance*," *Revista RI – Relações com Investidores*, no. 279 (2024). Accessed May 15, 2025. https://www.revistari.com.br/279/2174

54. BNDES. *Blended Finance Partnerships*. Available at: https://www.bndes.gov.br/wps/portal/site/home/desenvolvimento-sustentavel/parcerias/blended-finance

ects to apply for the bank's catalytic capital, which is offered at very low interest rates — below Brazil's CDI and sometimes even below inflation.

BNDES' involvement in blended finance began with non-reimbursable funding for the third sector, and the bank then started to partner with the private sector to leverage funding and implementation capacity for large projects. The bank has an operational team dedicated to measuring project impact in-house. Today's challenges in unlocking BNDES's blended finance resources include the difficulty of securing acceptable guarantees for the bank and, in the case of carbon-related projects, the challenge of finding truly binding offtake agreements, as well as the uncertainty around how voluntary and regulated carbon markets will integrate. BIS capital rules can also complicate the ability of BNDES to invest in high-impact projects. What BNDES is doing now is working with other catalytic capital players to study new guarantee structures and offtake agreements that could meet the bank's requirements.

7. Conclusion

It is a long road for a $20 mm investor check to reach an individual extractivist in an isolated rural area who needs a $50,000 loan. It takes a cooperative to reach this producer and help him with technical assistance. It takes an NGO to support the cooperative in sourcing working capital. It takes multiple capital markets regulated players to structure the operation. It takes multiple third parties to issue independent opinions; and it takes investors with different risk return profiles to invest in the operation. And all of these participants have different requirements and constraints. Structuring these operations takes therefore longer than standard agribusiness operations and requires resilience.

The characters are many, but when an operation succeeds, it's generally due to a few impact-driven motivated protagonists that walked the extra mile to make these moving parts connect. Both the operations displayed here were structured by the invested company itself (Belterra) or an NGO, together with the support of the catalytic capital (Fundo Vale), with private capital coming later on. Counterintuitively, most interviewed parties agreed that sourcing private capital is harder than finding the catalytic one.

Structuring and fundraising blended finance operations is lengthy and complex—especially because most market players do not have professional blended finance teams

capable of analyzing and evaluating these operations through the appropriate lenses. Subordination is often not enough for credit risk teams, who request additional guarantees – a request that can be impractical in agroforestry. Some technical issues are noteworthy, such as the unreliability and lack of integration of notaries and registries, which can delay operations and add a layer of complexity.

The case also shed light on the lack of flexibility of commercial banks when facing non-traditional structures in non-traditional sectors. This includes their limited capacity to analyze diverse types of crops or to be flexible regarding how interest rates are determined (fixed or variable). Many of these rigidities and requirements ultimately result in higher costs for blended finance structures, particularly through one-off fees for external intermediaries such as consultants and experts.

Markets players have innovated and adjusted traditional financial instruments to allow blended finance, such as the CRA, but with some tweaks. For example, historically, different tranches of fixed income instruments are generally structured so that the subordinated tranche is expected to earn a higher return than the senior tranche, to compensate for the extra risk brought by the amortization waterfall structure. For blended finance situations, what has been seen with the CRA and, in a way, with the Fiagro FIDC, is that the subordinated tranche actually receives a lower return due to its catalytic nature.

In Brazil, the mining industry plays a crucial role in the economic development of the cities it touches, generating jobs and opportunities. In fact, of the five Brazilian cities with the highest GDP per capita, four have mining as their main economic activity[55]. In Vale's case, mining also means providing the fundamental materials needed to address one of the world's most pressing challenges, namely energy transition. At the same time, mining is a high-impact industry, with impact on territories and communities. In Brazil, past accidents have led to environmental devastation and human tragedies.

Aware that mining has significant direct and indirect impacts, Vale is committed to reducing its negative impact, while increasing its positive impact for nature and society. Through the creation of Fundo Vale, Vale has financed high-impact sustainability initiatives, which align with Vale's core strategy. With this initiative, Vale sets a global example of how blended finance can be highly effective in fostering long lasting socio-environmental impact.

55. Itatiaia. *Mining, oil, and gas boost the economy in cities with the highest GDP per capita in Brazil*. December 17, 2023. Accessed May 16, 2025. https://www.itatiaia.com.br/politica/2023/12/17/mineracao-petroleo-e-gas-impulsionam-economia-em-cidades-com-maior-pib-per-capita-do-brasil

References

1. AMAZ. *About AMAZ – Impact Accelerator*. 2024. Available at: http://amaz.org.br/. Accessed on: May 18, 2025.
2. ANBIMA – ASSOCIAÇÃO BRASILEIRA DAS ENTIDADES DOS MERCADOS FINANCEIRO E DE CAPITAIS. *ESG Guide II – ESG Aspects for Managers and Investment Funds*. 2021. Available at: https://www.anbima.com.br/data/files/08/E7/AC/BC/8B54181056C3B2186B2BA2A8/ESG_Guide_II.pdf. Accessed on: May 18, 2025.
3. B3 – BRASIL, BOLSA, BALCÃO. *Agribusiness Receivables Certificate*. [n.d.]. Available at: https://www.b3.com.br/pt_br/produtos-e-servicos/negociacao/renda-fixa/certificado-de-recebiveis-do-agronegocio.htm. Accessed on: May 16, 2025.
4. BANCO CENTRAL DO BRASIL. *Copom increases the Selic rate to 14.75% p.a.* May 7, 2025. Available at: https://www.bcb.gov.br/en. Accessed on: May 18, 2025.
5. BELTERRA AGROFLORESTAS. *Who we are*. [n.d.]. Available at: https://www.belterra.com.br/. Accessed on: May 18, 2025.
6. BIOMAS. *Home*. [n.d.]. Available at: https://www.biomas.com/en. Accessed on: May 18, 2025.
7. BLOOMBERG NEWS. *Vale Buys Control of Canadian Nickel Miner Inco*. Oct. 24, 2006. Available at: https://www.bloomberg.com/news/articles/2006-10-24/vale-buys-control-of-canadian-nickel-miner-inco. Accessed on: May 18, 2025.
8. CONEXSUS. *Institutional website*. Available at: https://www.conexsus.org. Accessed on: May 17, 2025.
9. CVM – SECURITIES AND EXCHANGE COMMISSION OF BRAZIL. *Resolution No. 175, of December 23, 2022*. Available at: https://conteudo.cvm.gov.br/legislacao/resolucoes/resol175.html. Accessed on: May 18, 2025.
10. EMBRAPA – BRAZILIAN AGRICULTURAL RESEARCH CORPORATION. *Land Tenure Situation – Sisal Territory*. [n.d.]. Available at: https://www.embrapa.br/agencia-de-informacao-tecnologica/territorios/territorio-sisal/carcateristicas-do-territorio/situacao-fundiaria. Accessed on: May 18, 2025.
11. EMPRESA DE PESQUISA ENERGÉTICA; MINISTÉRIO DE MINAS E ENERGIA. *Ten-Year Energy Expansion Plan 2034*. Brasília: EPE/MME, 2024. p. 507. Available at: https://www.epe.gov.br/pt/publicacoes-dados-abertos/publicacoes/Plano-Decenal-de-Expansao-de-Energia-PDE. Accessed on: May 18, 2025.
12. FOLHA DE S.PAULO. *Vale is sold for R$ 3.3 billion with a 20% premium*. May 7, 1997. Available at: https://www1.folha.uol.com.br/fsp/brasil/fc070513.htm. Accessed on: May 18, 2025.
13. FOLHA DE S.PAULO. *Privatization of Vale would yield R$ 5.4 billion today*. Feb. 17, 1996. Available at: https://www1.folha.uol.com.br/fsp/1996/2/17/brasil/29.html. Accessed on: May 18, 2025.
14. FUNDAÇÃO CERTI. *Amazon Journey*. 2024. Available at: https://jornadaamazonia.org.br/. Accessed on: May 18, 2025.
15. FUNDO VALE. *2023 Performance Report*. 2024. Available at: https://www.fundovale.org/relatoriode-performance/en/. Accessed on: May 18, 2025.
16. FUNDO VALE. *Catalytic Capital*. 2025. Available at: https://www.fundovale.org/portfolio/capitalcatalitico/. Accessed on: May 18, 2025.
17. FUNDO VALE. *Caaporã and Belterra start new partnership cycles with Fundo Vale*. June 6, 2024. Available at: https://www.fundovale.org/en/espaco-do-conhecimento/ultimas-noticias/caapora-and-belterra-start-new-partnership-cycles-with-fundo-vale/. Accessed on: May 18, 2025.
18. FUNDO VALE. *Engagement that transforms: Fundo Vale boosts sustainable businesses through a collaborative network*. Published on Feb. 10, 2025. Available at: https://www.fundovale.org/espaco-do-conhecimento/ultimas-noticias/engajamento-que-transforma-fundo-vale-potencializa-negocios-sustentaveis-com-rede-colaborativa/. Accessed on: May 20, 2025.
19. FUNDO VALE. *Impact Measurement and Management: GIMPACT*. 2022. Available at: https://www.fundovale.org/wp-content/uploads/2022/06/01_MaterialGuiaGimpact_ING-1.pdf. Accessed on: May 18, 2025.

20. FUNDO VALE. *Sustenta.Bio*. 2024. Available at: https://www.fundovale.org/sustenta-bio/. Accessed on: May 18, 2025.
21. FUNDO VALE BELTERRA FIAGRO – CREDIT RIGHTS – LIMITED LIABILITY. *Fund's bylaws*. Feb. 6, 2024. Available at: https://data.anbima.com.br/fundos/S0000748986/sobre-o-fundo. Accessed on: May 18, 2025.
22. GRUPO GAIA. *CRA Amazônia and Biomas | Issuances and Operations*. [n.d.]. Available at: https://emissoes.grupogaia.com.br/conexus/. Accessed on: May 17, 2025.
23. IBGE – BRAZILIAN INSTITUTE OF GEOGRAPHY AND STATISTICS. *IPCA hits 0.52% in December and has cumulative increase of 4.83% in 2024*. Jan. 10, 2025. Available at: https://agenciadenoticias.ibge.gov.br/en/agencia-news/2184-news-agency/news/42428-ipca-hits-0-52-in-december-and-has-cumulative-increase-of-4-83-in-2024. Accessed on: May 18, 2025.
24. ITATIAIA. *Mining, oil, and gas boost the economy in cities with the highest GDP per capita in Brazil*. Dec. 17, 2023. Available at: https://www.itatiaia.com.br/politica/2023/12/17/mineracao-petroleo-e-gas-impulsionam-economia-em-cidades-com-maior-pib-per-capita-do-brasil. Accessed on: May 16, 2025.
25. ITV – VALE TECHNOLOGICAL INSTITUTE. *Activity Report – Sustainable Development*. 2023. Available at: https://www.itv.org/wp-content/uploads/2024/06/Ebook.RelatorioAtividadesITV.2023.ing_.pdf. Accessed on: May 18, 2025.
26. FLAMMER, Caroline; GIROUX, Thomas; HEAL, Geoffrey M. *Biodiversity Finance*. *Journal of Financial Economics*, v. 164, 2025. Article no. 103987. Elsevier. Available at: https://doi.org/10.1016/j.jfineco.2024.103987. Accessed on: May 17, 2025.
27. JOÃO PEDRO N. *Building a sustainable ecosystem: the Building Blocks of green finance*. *Revista RI – Relações com Investidores*, n. 279, 2024. Available at: https://www.revistari.com.br/279/2174. Accessed on: May 15, 2025.
28. JOÃO PEDRO N. *CVM Resolution 193 and the adoption of sustainability disclosure standards*. *Consultor Jurídico (ConJur)*, Oct. 1, 2024. Available at: https://www.conjur.com.br/2024-out-01/a-resolucao-cvm-193-e-a-adocao-das-normas-de-divulgacao-de-informacoes-de-sustentabilidade/. Accessed on: May 18, 2025.
29. NASCIMENTO, João Pedro Barroso do. *Sustainable Finance*. FGV Direito Rio. Available at: https://direitorio.fgv.br/curso/extra/financas-sustentaveis. Accessed on: May 18, 2025.
30. REUTERS. *Indonesia says nickel miner Vale to build another $2 bln HPAL plant*. Mar. 18, 2024. Available at: https://www.reuters.com/markets/commodities/indonesia-says-nickel-miner-vale-build-another-2-bln-hpal-plant-2024-03-18/. Accessed on: May 18, 2025.
31. RESET. *From faria limer to MST investor: João Pacífico's turning point*. Available at: https://capitalreset.uol.com.br/. Accessed on: May 17, 2025.
32. RESET. *Blended finance: an alternative to unlock climate finance*. Available at: https://capitalreset.uol.com.br/. Accessed on: May 17, 2025.
33. RIO TINTO. *Rio Tinto releases fourth quarter production results*. Jan. 16, 2025. Available at: https://www.riotinto.com/en/news/releases/2025/rio-tinto-releases-fourth-quarter-production-results. Accessed on: May 18, 2025.
34. SUZANO. *Itaú Unibanco, Marfrig, Rabobank, Santander, Suzano and Vale unite to restore, conserve and preserve 4 million hectares of native forest in Brazil*. Nov. 16, 2022. Available at: https://www.suzano.com.br/news/itau-unibanco-marfrig-rabobank-santander-suzano-and-vale-unite-to-restore-conserve-and-preserve-4-million-hectares-of-native-forest-in-brazil. Accessed on: May 18, 2025.
35. UN-CONVENED NET-ZERO ASSET OWNER ALLIANCE. *Blended Finance Best Practice: Case Studies and Lessons Learned*. [n.d.]. Available at: https://www.unepfi.org. Accessed on: May 18, 2025.
36. VALE S.A. *Management Report 2024*. 2025. Available at: https://vale.com/en/announcements-results-presentations-and-reports#comunicados-relevantes. Accessed on: May 18, 2025.
37. VALE S.A. *Integrated Report 2024*. 2025. Available at:http://ri-vale.mz-sites.com/en/information-to-the-market/annual-reports/sustainability-report//. Accessed on: May 18, 2025.

38. VALE S.A. *Institutional Presentation*. Mar. 2025. Available at: https://vale.com/en/announcements-results-presentations-and-reports#comunicados-relevantes. Accessed on: May 18, 2025.
39. VALE S.A. *Human Rights*. [n.d.]. Available at: https://vale.com/in/esg/human-rights. Accessed on: May 18, 2025.
40. VERRA. *Project VCS 5006*. Available at: https://registry.verra.org/app/projectDetail/VCS/5006. Accessed on: May 18, 2025.
41. YOUTUBE. *CRA verde tem se consolidado no mercado*. Available at: https://www.youtube.com/watch?v=MwbDJjtUVOU. Accessed on: May 17, 2025.

Interviews

1. BACCI, Marcelo. Vale. Interview. May 11, 2025.
2. GUIOMAR, Julio Salarini. BNDES. Interview. May 15, 2025.
3. LUZ, Gustavo. Fundo Vale. Interview. April 30, 2025.
4. NASCIMENTO, João Pedro Barroso do. CVM. Interview. May 14, 2025.
5. ORTEGA, Valmir Gabriel; PERETI, Marcelo Ângelo; SANTIAGO, Júlio. Belterra. Interview. May 12, 2025.
6. PERETI, Marcelo Ângelo; SANTIAGO, Júlio. Belterra. Interview. May 8, 2025.
7. PENIDO, José Luciano. Interview. April 23, 2025.

Climate change and biodiversity loss pose existential threats to our way of life—indeed to all life on Earth — and are tightly intertwined with other systemic challenges such as poverty and social inequality. The mitigation of those challenges has historically been financed through public funding and philanthropy. Yet, a large financing gap remains, especially in the Global South. The practice of blended finance has emerged in recent years. Private capital is "blended" with public or philanthropic capital, whose aim is to de-risk a transaction and mobilize more capital. This can include investable projects in climate technology, nature-based solutions, regenerative agriculture, reforestation, social inclusion, and others. Through discussions with dozens of practitioners, we share lessons learned on sustainable investing. We see a need to better map existing sources of catalytic capital, reduce structuring costs and increase awareness. The case studies described in this book map the necessary conditions to make blended finance structures successful. On the road to COP30, taking place in the heart of the Amazon in Belém, there is an urgent need for innovative financial solutions to tackle social and environmental challenges. With its economic relevance, global connectivity with all trading blocks, vibrant culture and unique natural assets, Brazil is in a key position to become a center of innovation and excellence in sustainable finance.

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