



EXECUTIVE SUMMARY

A Balancing Act for Brazil's Amazonian States

An Economic Memorandum

Marek Hanusch, Editor



WORLD BANK GROUP

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INTERNATIONAL DEVELOPMENT IN FOCUS

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MAREK HANUSCH, EDITOR



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Executive Summary

IMPROVING LIVING STANDARDS AND CONSERVING EXCEPTIONAL NATURAL WEALTH IN BRAZIL'S LEGAL AMAZON

Brazil's Legal Amazon, here called *Amazônia*, comprises nine states, most of which rank among the poorest in Brazil. It is a vast territory of 502 million hectares, larger in area than the European Union (EU), and home to 28 million Brazilians.¹ Although *Amazônia* is mostly known for its vast natural forests, over three-quarters of Amazonians live in towns and cities. Thirty-six percent of *Amazônia*'s population lives in poverty.²

Amazônia is home to about 60 percent of the Amazon rainforest and also to parts of other important biomes like the Cerrado savanna and Pantanal wetlands. These natural landscapes comprise large contiguous, mainly forested, areas, many of which have remained relatively untouched by the past 12,000 years of human expansion into natural lands.

Amazônia is one of the world's last frontier regions. But economic expansion has moved into those ancient forests, destroying them at a rapid rate—especially in *Amazônia*'s southeast, within what is known as the “Arc of Deforestation”—and threatening the ways of life of many traditional communities. There is an urgent need for an alternative development path for *Amazônia* that promotes inclusion and sustainable natural-resource use.

This memorandum presents a multipronged approach, a balancing act that seeks to simultaneously provide a pathway to higher incomes for Amazonians while also protecting natural forests and traditional ways of life by focusing on four strategic actions:

- ***Increasing the welfare of Amazonian citizens*** by fostering productivity through structural transformation in both rural and urban areas
- ***Protecting the forest*** by strengthening land and forest governance, including the enforcement of existing laws (command and control)
- ***Fostering sustainable rural livelihoods*** by unlocking the natural capital associated with the standing forest and protecting the poor and traditional ways of life
- ***Marshaling conservation finance*** linked to measurable reduction in deforestation and drawing on public and private resources or market-based solutions.

The cost of inaction is high

Recognizing the exceptional value of Amazônia's natural forests is critical to halt their destruction. Brazil is responsible for about one-third of the world's tropical deforestation, largely linked to cattle ranching (Pendrill et al. 2019). Amazônia is Brazil's hot spot for deforestation, most of which is illegal.

Moreover, the Amazon rainforest is at risk of reaching a tipping point where climate change and deforestation would combine to cause the permanent die-back of large tracts of rainforest. Although tipping points remain surrounded by uncertainty, including the thresholds at which they would be triggered, the catastrophic implications make this a risk not worth taking. Three-quarters of the rainforest has already lost resilience since 2000 (Boulton, Lenton, and Boers 2022). Deforestation puts at risk the value of Brazil's standing Amazon rainforest, estimated to exceed US\$317 billion per year—up to seven times more than the estimated private exploitation value linked to extensive agriculture, timber, or mining (Strand 2022).

The Brazilian rainforest's public-good value includes its ecosystem services, which for the South America region alone are an estimated US\$20 billion annually, including precipitation needed for the region's agriculture and protection against soil erosion and fire (Strand 2022). Global public values associated with the standing forest are even higher, especially owing to the Amazon's role as a carbon sink: the annual value of carbon storage is estimated at US\$210 billion, with option and existence value linked to biodiversity and forest cover adding another US\$75 billion.³ Private use values associated with the standing Amazon, such as production of nontimber products or sustainable tourism, are estimated at US\$12 billion annually. Accordingly, the cost of inaction is high, both in the Amazon rainforest and in Amazônia's other biomes.

Stopping illegal deforestation is not only an economic and environmental prerogative but also consistent with Brazil's commitments under the Paris Climate Accords: land, land use change, and forestry is Brazil's leading source of gross greenhouse gas emissions, and accordingly, stopping illegal deforestation is an explicit priority in Brazil's original Nationally Determined Contribution. At the 2021 United Nations Climate Change Conference—also referred to as the 26th annual Conference of the Parties (COP26)—Brazil advanced its zero illegal deforestation target to 2028. Fulfilling this commitment is important for the Brazilian government to demonstrate its policy credibility to its citizens and the world while meeting its obligations toward arresting global warming as a member of the international community. Given its green energy matrix, decisively curbing deforestation would make Brazil a green country and unlock benefits in international trade as the world decarbonizes (World Bank 2023a).

Beyond the climatic and economic considerations associated with deforestation, the cost of inaction also includes slow social progress. In most Amazonian states, especially the more remote ones, poverty has stagnated or increased in recent years. Living conditions of the poor remain precarious in both rural and urban areas, particularly disadvantaging Indigenous people, Afro-Brazilians, *caboclos* (people of mixed heritage), and female-headed households.

Amazônia has a strong foundation to control deforestation

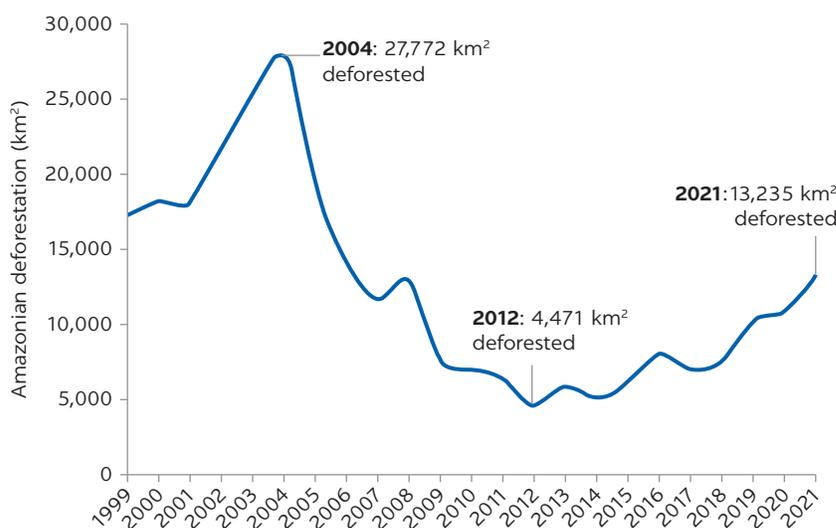
In the 2000s, Brazil implemented a series of measures to shore up the protection of Amazonian forests, especially the Amazon rainforest. The Amazon

Region Protected Areas Program, launched in 2002, created 60 million hectares of protected area (currently totaling about 209 million hectares of protected areas or Indigenous territories, equivalent to 42 percent of Amazônia's territory). In 2004, the government adopted the Action Plan for the Prevention and Control of Deforestation in the Legal Amazon, which initially focused on land tenure and territorial planning, sustainable production, and environmental monitoring and control. In addition, law enforcement was stepped up through remote sensing monitoring, including the Real-Time Deforestation Detection System (DETER). Since 2008, there has been an increase in targeted enforcement actions in priority (blacklisted) municipalities. In 2012, Brazil updated its 1965 Forest Code and introduced the Rural Environmental Cadastre (CAR), an innovative database and environmental management tool. These public actions were complemented by private sector commitments, such as the 2006 Amazon Soy Moratorium and the 2009 Zero Deforestation Cattle Agreement.

Some of these measures were more effective than others, but jointly they have contributed to a significant decrease in the rate of deforestation. From a high of 27,772 square kilometers in 2004, deforestation in Amazônia fell to 4,471 square kilometers in 2012, a reduction of 84 percent.⁴ However, Brazil has not been able to sustain this encouraging trend: Amazonian deforestation has accelerated markedly again since 2015, reaching 13,235 square kilometers (the equivalent of 1.8 million soccer fields) in 2021 (figure ES.1).

Enforcing Brazilian laws to protect natural forests has thus become more urgent, and additional measures should be considered that can promote both forest protection and inclusive growth, as discussed in this memorandum. In the short term, political will is critical for Brazil's forest protection institutions to work effectively.

FIGURE ES.1
Deforestation is on the rise in Amazônia



Sources: World Bank, using data from the Project for Satellite Monitoring of Deforestation in the Legal Amazon (PRODES) of the National Institute for Space Research (INPE).

Note: The figure shows annual deforestation in Amazônia. km² = square kilometers.

There is a strong need to reinvigorate social progress

There are important links between environmental sustainability and social progress, and any approach to development for Amazônia must recognize the legitimate desires of its nine states to improve their citizens' standards of living.

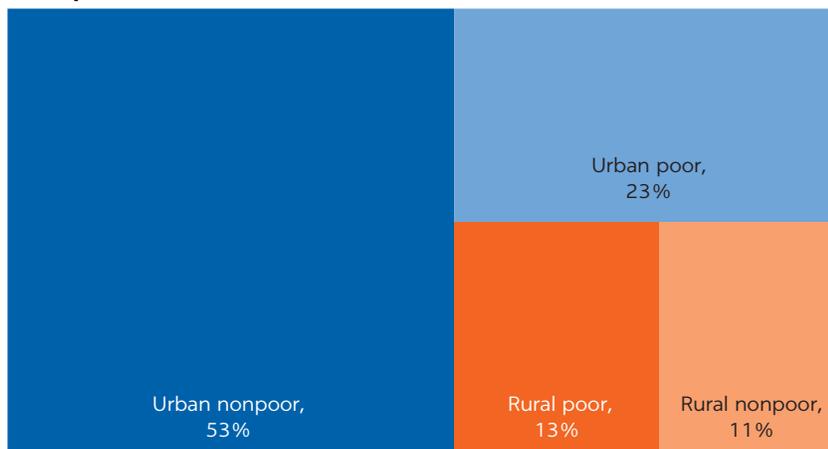
Amazonian economies are not particularly good in delivering jobs: unemployment among Amazônia's urban poor stood at 29 percent in 2019 and has worsened during the COVID-19 crisis.⁵ Cities struggle to generate good jobs, and informality is high. Rural unemployment is much lower, but this masks relatively higher levels of low-productivity informal work. Given that Amazônia is already quite urbanized, most poor Amazonians, 6.5 million, live in urban areas, with 3.8 million in rural areas (figure ES.2).⁶ In rural areas, poverty, however, is more precarious.

Significant gaps in public services also persist across Amazônia, especially in rural areas. Considerable progress was made in rolling out electricity, but many other services are lagging: in 2019, 34 percent of the rural poor had no access to improved sanitation, 46 percent relied on open defecation, and 86 percent had no access to solid waste collection.⁷ Public services are better in urban areas, including for the poor, but housing deficits are significant and much higher than in Brazil overall. Many urban inhabitants live in favela-like settlements, ranging from about 2 percent of the urban population in Mato Grosso to 35 percent in Amazonas.⁸

COVID-19 exposed some of the weaknesses of health systems in Amazônia, many of which were overwhelmed by the pandemic. Preliminary data show that mortality in hospitals in the North region (which includes seven of the nine Amazonian states) was higher than in any other region of Brazil. In fact, mortality among patients admitted to intensive care units was 79 percent in the North (highest in the country), compared to Brazil's average of 55 percent. Even before the pandemic, the North region already had higher in-hospital mortality compared to other regions (Ranzani et al. 2021).

FIGURE ES.2

Most poor Amazonians live in towns and cities



Sources: World Bank, using Socio-Economic Database for Latin America and the Caribbean (SEDLAC) and Brazil Continuous National Household Sample Survey (PNADC) 2019 data via the World Bank's datalibweb Stata package.

Note: The figure shows 2019 shares of Amazônia's population. "Poor" is defined as those living at or below the poverty line of US\$5.50 per person per day.

Finally, crime is a major issue in Amazônia, connected to organized crime, drug trafficking, corruption, and smaller-scale armed robberies and personal conflicts, symptomatic of the region's weak rule of law.

Development solutions should include an emphasis on generating jobs—including productivity growth—and strengthening institutions for social progress across Amazônia.

Development solutions must account for Amazônia's diversity

Amazônia is rich not only ecologically but also culturally. It is Brazil's region with the largest number of Indigenous people—about 380,000, accounting for 1.5 percent of Amazônia's population, with nearly half of them living in the state of Amazonas (IBGE 2012). Many Indigenous Amazonians move across rural and urban spaces, and about 20 percent permanently live in state capitals.

Numerous small Indigenous communities continue to exist in complete isolation in remote parts of the forest. Other traditional groups in Amazônia include *ribeirinhos* (river communities) and *quilombolas* (descendants of fugitive African slaves). These groups tend to maintain strong cultural ties to Amazônia's natural lands. At the same time, they tend to have lower incomes and poorer access to services. Inclusive development in Amazônia needs to carefully account for the region's traditional peoples, whether they choose to embrace urban life, continue their traditional rural lives, or both.

Amazônia's mostly forested north is quite different from the southeastern parts through which the Arc of Deforestation has already passed. These parts account for most of Amazônia's population and have more consolidated markets and institutions. This is a region marked by in-migration from other parts of Brazil over decades as well as by commercial farming. Although this region tends to be more affluent, poverty remains an important challenge.

AMAZÔNIA IN BRAZIL AND THE WORLD

Amazônia's development context has global and national origins. As the world has become richer and the global population has grown, its demand for commodities has increased. Rising demand for agricultural and mining products has fueled Brazil's resource-intensive growth. It also led to deforestation, now especially in Amazônia, as agricultural production helps meet national and global food demand.

At the same time, the world is awakening to the impact of its demand on deforestation and its devastating natural, social, and economic consequences. Global efforts are increasing to promote deforestation-free value chains through consumer awareness and trade measures. Companies increasingly demand deforestation-free products from their suppliers. These trends are at times seen as a threat to economic growth in Brazil and Amazônia. But they also indicate an opportunity to upgrade the country's growth model to one that will simultaneously deliver natural resource protection and sustainable and inclusive development. A change in the growth model matters for Brazil and Amazônia.

Brazil has reached upper-middle-income status on the back of factor accumulation, including demographics and expanding education (labor accumulation), savings and investment (capital accumulation), and

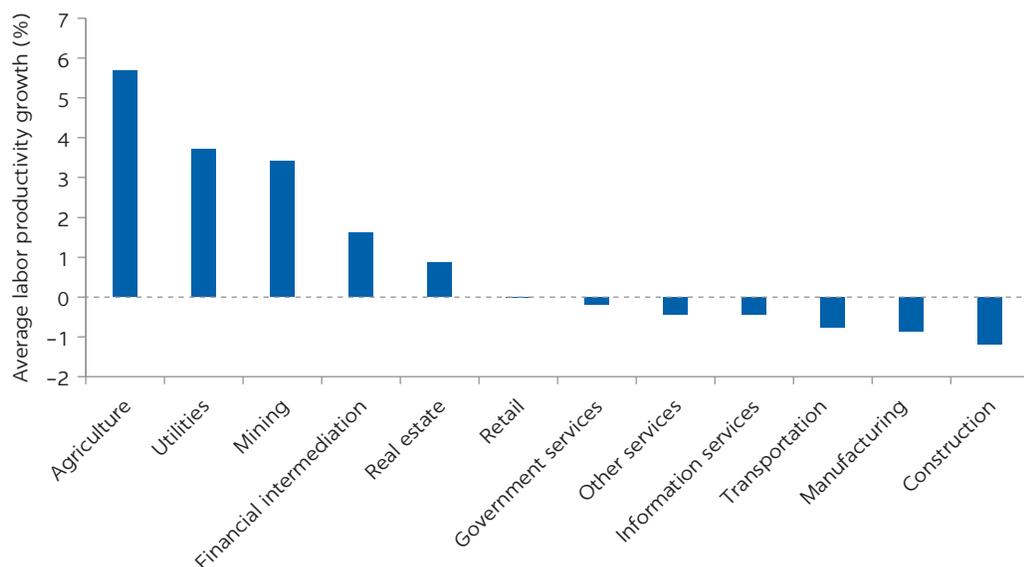
expanding the agricultural frontier (land accumulation). In this sense, deforestation is a key part of the current growth model. Yet factor accumulation has its limits—and, in the case of Brazil, potentially devastating effects for Amazônia's forests. Brazil's future prosperity will hinge on its ability to raise productivity in sectors beyond commodities (the so-called “urban sectors” like manufacturing and services), which are currently Brazil's least competitive sectors (figure ES.3). Meanwhile, Brazil's export basket remains dominated by commodities (figure ES.4).

Because the Amazonian economies are nested within the Brazilian economy, accounting for less than 10 percent of Brazilian gross domestic product (GDP), solutions to Amazonian challenges are not limited to Amazônia alone. This memorandum shows that accelerating productivity growth across Brazil, including in urban sectors, would support sustainable and inclusive growth in Amazônia for three reasons:

- Productivity growth in other parts of the country would raise demand for goods produced in Amazônia, especially benefiting states like Amazonas that are integrated with domestic product markets.
- It would attract workers away from Amazônia, reducing the local labor supply and thus raising local wages.
- It would reduce deforestation by attenuating the external competitiveness of Amazonian commodities, reducing pressures on rural lands and thus on Amazônia's natural forests.

A more balanced growth model with productivity gains across all sectors, including the urban ones, is critical for Brazil more generally and for Amazônia specifically.

FIGURE ES.3
Brazil's labor productivity imbalance between commodities and more-urban sectors, 1996–2021



Source: Regis Bonelli Productivity Observatory database of the Getulio Vargas Foundation's Brazilian Institute of Economics (FGV IBRE).

Note: The figure shows average annual labor productivity growth from 1996 to 2021.

INCREASING THE WELFARE OF AMAZONIAN CITIZENS IN URBAN AND RURAL AREAS

Balancing structural transformation through improvements in both rural and urban productivity

Within Amazônia, Mato Grosso has followed the Brazilian resource-intensive growth model, turning the state into a large exporter of agricultural commodities, notably soy. It has made Mato Grosso Brazil's fourth richest state and by far the most affluent in Amazônia. In some ways it currently serves as a role model to other Amazonian states. Yet Mato Grosso's economic rise came at the largely unaccounted cost of vast forest loss: if other Amazonian states follow Mato Grosso's historical path, the Amazonian forests would be largely wiped out, with disastrous environmental and economic consequences. A different development approach is therefore needed, one that brings broad-based economic growth across all sectors of the economy in both rural and urban areas while reducing economic incentives for deforestation.

Increasing productivity in rural and urban areas will require structural transformation. To raise living standards and provide workers opportunities beyond agriculture, it is critical to achieve productivity gains in more urban sectors, such as manufacturing and services. Yet the economic performance of urban areas in Amazônia—as in other parts of Brazil—has been lagging, leading to poor labor market outcomes and precarious living conditions.

Increased urban productivity can also help contain the Jevons effect for two reasons: First, it strengthens other sectors relative to agriculture, thus attenuating the external competitiveness of Amazônia's agriculture sector. Second, it lowers the cost of machinery and inputs (like seeds or fertilizer) relative to the cost of land (and labor). This memorandum shows that urban and agricultural productivity gains are complements—promoting agricultural intensification and thus lowering deforestation. Notably, this complementarity does not depend on the sectors being integrated through value chains. In fact, the memorandum suggests that, where forests are at risk, deep rural value chains in manufacturing can be harmful to forests because productivity gains in the sector would raise the demand for agricultural inputs.

Removing market distortions

Several distortions facilitate the current growth model, many of which are linked to Brazil's colonization process (such as large areas of unregularized land) or to its historical industrial and trade policies. Removing distortions would support the shift to a less resource-intensive, more productivity-driven growth model.

In land markets, the following distortions are among the most significant:

- **Undesignated land.** A huge portion of Amazonian land comparable to the joint size of Norway, Sweden, and Finland remains without proper designation. These areas await designation as conservation units, Indigenous lands, agrarian reform settlements, land eligible for tenure regularization, or some other category of tenure. Undesignated areas have the highest rates of deforestation linked to land grabbing.
- **Tenure insecurity.** Many rural settlers remain without land titling, often for decades, limiting production potential.

- **Inadequate land taxation.** The rural land tax (Imposto sobre a Propriedade Territorial Rural, or ITR), originally intended to foster agricultural intensification in its current form promotes extensive agriculture and deforestation.
- **Weak law enforcement.** There is ineffective enforcement of the law meant to preserve the integrity of protected areas or Indigenous territories and to safeguard that at least 80 percent of private properties in the Amazon (and somewhat lower values in other biomes) remain forested. In practice, poor law enforcement lowers the cost of illegal logging and land use.

Collectively, these distortions in land markets constrain productivity and lock production factors into extractive practices that could otherwise be invested to promote balanced structural transformation. There are thus important links between policies focused on effective land and forest governance and economic development.

In labor markets, low human capital and skills mismatches undermine productivity and structural transformation—and this can also further contribute to deforestation if less productive farmers cannot transition to more sustainable rural or urban jobs. This highlights the criticality of policies focused on education, training, reskilling, and sustainable livelihoods.

Distortions also exist in input and product markets. Federal rural credit policies currently provide an implicit advantage to agriculture—a land-intensive sector—over other sectors. Rather, policy should focus on supporting climate-smart practices in agriculture, including integrated landscape approaches,² that require a shift from incentivizing private goods through relatively untargeted credit to incentivizing public goods, such as through Brazil’s ABC Plan.¹⁰

At the same time, fiscal incentives to manufacturing in Amazonia have not helped incentivize productivity growth and should be reassessed. Generous fiscal incentives from the federal budget (amounting to about 0.4 percent of national GDP) have attracted firms to Amazonas State, arguably Amazônia’s most urban economy. Goods from TVs to motorcycles, cell phones, and air conditioning units are produced in the Zona Franca de Manaus (Manaus Free Economic Zone), sustaining many jobs in Manaus, a city of 2 million people in the middle of the rainforest. Despite the substantial fiscal cost, Amazonas has been losing competitiveness, however, and finds it increasingly difficult to attract new businesses. The number of manufacturing jobs has also been declining, with a concomitant increase in capital intensity.

Clearly, more fiscal incentives for firms are not the solution, because they introduce distortions that incentivize companies to locate to places where they would not otherwise locate and result in reduced productivity—the exact opposite of what a productivity-focused growth model would try to achieve. Instead, Manaus should focus more on leveraging its significant urban capabilities by generating a conducive business climate (World Bank 2023b).

In addition, trade barriers significantly distort product markets. Brazil is among the world’s more closed economies, and its participation in global value chains tends to concentrate on the export of primary commodities. Manufacturing and services are highly protected, introducing large distortions. Opening up those sectors would attract foreign direct investment, while greater competition tends to raise average productivity in Brazil more broadly and in Amazônia specifically.

Yet care is needed in the design of trade agreements. For one, they can directly hurt Amazonian states that depend on duty exemptions, notably Amazonas, further highlighting the need for a lower dependence on fiscal incentives. Second, they can harbor risks for Amazônia's forests. Under the trade agreement between the EU and the Southern Common Market (MERCOSUL, of which Brazil is a member), whose ratification remains pending, the EU will open its markets to more Brazilian agricultural exports while Brazil will gradually open its manufacturing sector. Various environmental safeguards are intended to reduce the impacts of this improved market access on deforestation. Such safeguards have a mixed record unless adequately implemented and enforced.¹¹ Trade agreements that include agricultural liberalization will remain a risk to the conservation of the Amazonian forests until economic and institutional maturity have sufficiently advanced.

Ensuring appropriate logistics

Lower transport costs would foster productivity, but transport systems need to be carefully tailored. Rural roads are often the most immediate cause of deforestation. They unlock the potential of land that is currently underpriced because of distortions in the land market. Proper pricing of Amazonian land, taking into account the value of standing forests, would reduce the attractiveness of rural land for agricultural production and unlock labor and capital resources for urban production. A greater focus on urban productivity and connectivity would also lower the need for rural roads. Most Amazonian cities are already connected to markets via road, rail, air, or water transport. In fact, within the Amazon biome, nearly all cities are connected by river, since they originated in the colonial period when settlers navigated the region by river.

Acknowledging the need to minimize adverse impacts on the biodiversity of Amazônia's extensive river systems as much as possible, river transport could be an effective and relatively cost-effective mode of shipping goods and could help reduce Amazônia's cost of remoteness. But there are significant challenges in the cabotage system, including low competition—a structural issue (that tax incentives partly aim to compensate for). Improving the competitiveness of river transport to connect Amazônia's cities could be a better alternative to rural roads.

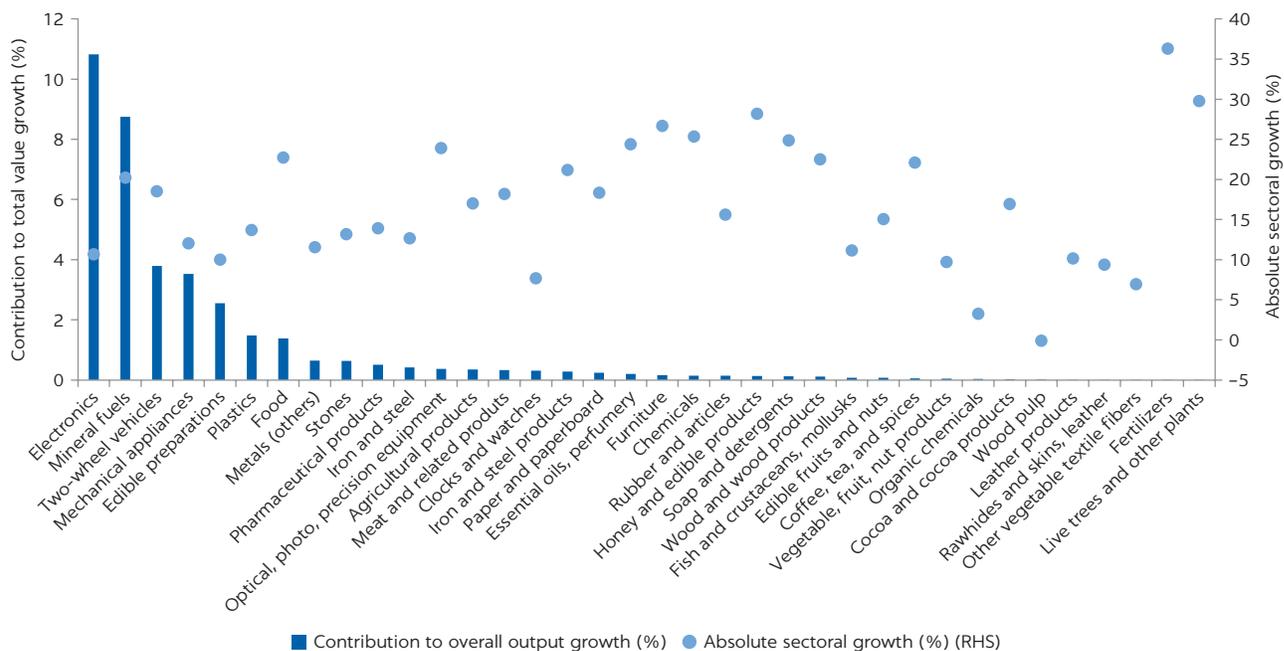
This memorandum shows for the state of Amazonas that lowering transport costs by 12.5 percent (say, by reforming the cabotage system) would raise the state's GDP by about 38 percent (figure ES.5)—more than the annual amount of current fiscal incentives to the Zona Franca de Manaus.

Developing a network of cities

Given how fragmented the urban landscape is in the Amazonian vastness, only a few cities can likely become competitive. But since the Amazonian population is relatively small, a few successful urban centers could suffice for significant development progress. In the least developed states in Amazônia's north, the state capitals have the greatest potential to become economic nodes. Currently, they tend to be dominated by the public sector, but their urban density, infrastructure, and capabilities could also allow them to develop a more dynamic private sector. A few additional contenders as economic nodes, beyond the state capitals, can be found in the more developed and more populated states of Mato Grosso, Maranhão, Pará, and Rondônia. To the extent that

FIGURE ES.5

Tackling transport costs would benefit many sectors of the economy: Example from Amazonas State



Source: See the companion report to this memorandum, World Bank 2023b.

Note: The figure shows the estimated impacts, by sector, of a 12.5 percent reduction in transport costs from and to Amazonas State. Contributions to growth account for interlinkages across sectors but sectoral effects do not. Larger sectors tend to make higher contributions to overall growth.

these cities already lie in more consolidated agricultural regions of Amazônia, strengthening rural-urban links there can further propel development with lower risks to forests.

While economic nodes have the potential to generate the dynamics supporting regional convergence, several smaller towns could become service nodes. They have less potential for competitive economic dynamism but can act as a bridge between urban and rural spaces. They are large enough to leverage the scale required to deliver certain public services, such as hospitals, and they are associated with better education outcomes than villages. Service nodes can secure a minimum service provision for more remote parts of Amazônia while generating human capital foundations for their inhabitants, serving as stepping-stones for economic nodes of Amazônia or even other parts of the country.

Strengthening institutions in Amazônia

Health and education. Skills pave the way for better jobs, whether in Amazônia, other parts of Brazil, or outside Brazil. Agriculture can absorb a significant amount of unskilled labor, but manufacturing and many types of services are more skill intensive. Strengthening Amazônia's human capital foundation is critical for the implementation of a sustainable and inclusive growth model. Amazonian states have lower levels of human capital than other parts of Brazil. Gaps in health are smaller than gaps in education, but poorer Amazonian states tend to have relatively wider health gaps. This reflects weaker health institutions in poorer areas and lower levels of urbanization, as many health services (such as hospitals) require a minimum scale to operate.

Education holds the key to raising human capital, and there has been some progress in improving education in Amazônia, including for Indigenous people, yet significant gaps remain. On average, 65 percent of 10-year-old children in Amazônia cannot read and understand a short, age-appropriate paragraph, well above the Brazilian average of 48 percent in 2019 (World Bank 2022). The COVID-19 pandemic has further weakened the region's human capital. Regaining ground and building on past achievements requires investing in teachers and strengthening systems for training and reskilling. These interventions at the basic level will also be critical to help raise Amazônia's enrollment in tertiary education—the foundation of modern urban economies.

Municipal services. Living conditions and sanitation services are considerably worse in Amazônia than in the rest of Brazil, especially among the poorer and rural populations. Although poor urban dwellers in Amazônia face worse conditions than in other parts of Brazil, there are clear advantages to living in cities, including near-universal access to electricity and better sanitation. Consistent with the notion of a frontier economy where both infrastructure and public service governance still need to mature, conditions are much worse in rural areas, especially for poor households. As noted earlier, about 86 percent of the rural poor have no access to trash collection, 65 percent have no household water connection, and 48 percent lack a private bathroom.¹² Poor service delivery is linked not only to limited budgets but also to weak governance, including for garbage, sewage, water management, and other urban services, albeit with significant variance in performance across Amazônia. Providing adequate municipal services is critical to raise living standards in urban and rural areas.

In rural areas, minimum service provision can be expensive or even infeasible given the distances and natural conditions of Amazônia, including seasonal flooding. Technology provides some opportunities, including green solutions (such as solar panels, mobile clinics, and satellite internet), despite limitations. Access to basic infrastructure services, such as electricity and water and sanitation, will be needed for all rural communities. Rural investments need to be future-oriented and consistent with economic transformation, which includes facilitating out-migration of rural populations. Ensuring a minimum living standard is important not only from a rural poverty perspective but also to reduce push factors for unproductive urban migration.

Law enforcement. Enforcing the law has been a challenge in Amazônia. This makes it difficult to reduce illegal activities prevalent in Amazônia, ranging from drug trafficking to wildcat mining to illegal deforestation. The magnitude of the challenge shows that although Amazonian states spend a considerable share of their budgets on the judiciary, budgetary outlays do not translate into effective upholding of the law.

In some cases, the attitude of governments toward illegal behavior is rather lax. For example, in the case of land grabbing, deadlines for the regularization of illegally occupied land continuously shift into the future. And certain environmental crimes—such as violation of the Forest Code—are not consistently prosecuted.

Weak law enforcement is often aided by an enabling political environment. Indeed, under a growth model anchored in resource extraction, it will be difficult to protect natural resources. A shift away from this model, as this memorandum advocates, could strengthen the political will to protect Amazônia's

forests, because a productivity-led growth model is consistent with conservation.

IMPROVING FOREST PROTECTION

Effective natural capital governance rests on strong, enforced institutions. Protecting Amazônia's forests requires institutional reform to reverse the promotion of extensive agriculture (for example, through rural credit and the rural land tax), regularize lands, and enforce existing laws (command and control). Fostering sustainable value chains will be critical, and private investment must be responsible, supported by good corporate governance. Conservation finance should be leveraged to fund efforts to protect forests while laying the foundations for more sustainable and inclusive development in Amazônia.

Reform rural credit

Rural credit should favor productivity and sustainability. Rural credit policies currently provide an implicit advantage to agriculture—a land-intensive sector—over other sectors. The credit policies inefficiently promote agriculture because of both credit program fragmentation and the distortions arising from credit earmarking, which in fact reduces productivity. Central bank regulations to reduce the direct impact of rural credit on deforestation are an important advance. To further reconcile agricultural growth with environmental and fiscal sustainability, government support to agricultural finance should

- **Focus fiscal support on smaller, productive farmers**, with a greater emphasis on resilience rather than just production and using instruments other than interest rate subsidies, such as partial credit guarantees and support for agriculture insurance;
- **Revise subsidies and incentives to lending programs for large farms**, targeting them exclusively to programs that clearly contribute to public goods (including low-carbon agriculture and agroforestry methods);
- **Revise programs for midsize farmers** based on analyses of current market conditions, gradually phasing out credit quotas and interest rate caps; and
- **Remove quotas and interest rate caps for loans to large farmers** to avoid distorting competition.

Reform land taxes

The rural land tax (ITR) generates perverse incentives for deforestation and could be reformed in four ways:

- **Adjust the stocking rates** (heads of livestock per hectare) employed in calculating the tax to better reflect realistic levels of productivity, associating lower tax rates with much higher levels of ranching productivity. This would affect the tax burden regarding the productive taxable area (which notably excludes forests).
- **Update the definition of total property size** for ITR calculations. Both the productive taxable area and the total property area should be net of forests to reduce deforestation incentives.
- **Better integrate the ITR and the CAR** to ensure that environmental protection areas are respected.

- **Replace self-declaration by owners with an independent assessment** to avoid the underestimation of tax responsibilities and make the ITR more effective.

Raising the ITR rate could also reduce deforestation pressures, while returning the proceeds to farmers could mitigate associated welfare losses (Souza-Rodrigues 2019).

Accelerate land regularization

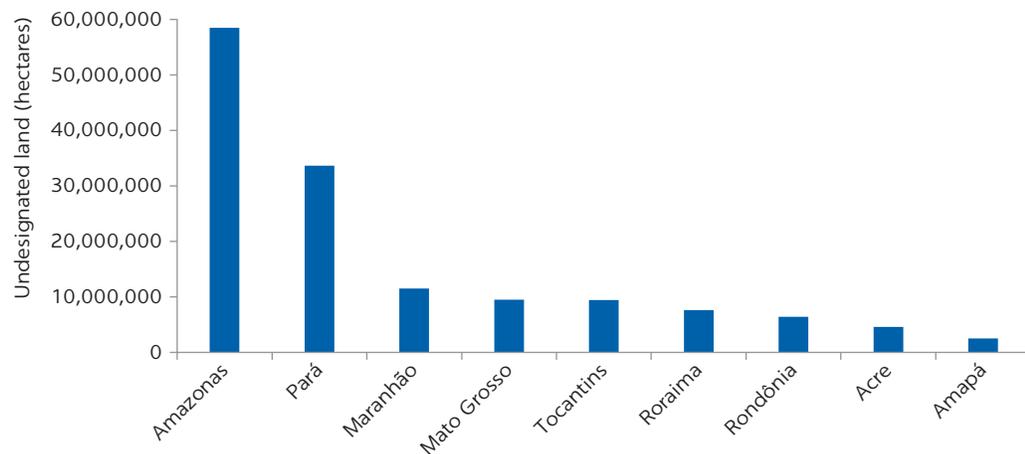
Tenure security affects both welfare and forest protection. In particular, land regularization should be prioritized as a public investment in an essential public good. For example, clarity in land tenure is important to allow an effective and fair conditioning of credit on compliance with forest protection laws. It is also important for accountability because land tenure uncertainty creates gray areas for law enforcement agencies concerning breaches of environmental protection laws.

Completing the designation of undesignated public rural lands is critical. Undesignated areas (figure ES.6) continue to be deforestation hot spots. They may even reflect an implicit policy preference in the states of Amazônia to develop agriculture: currently, land is transferred from public to private ownership at prices much below market levels (figure ES.7), while an unbalanced policy focus on agricultural expansion creates strong expectations that rural land prices will rise. This makes speculation on rising land prices rational, thus incentivizing land grabbing.

A more balanced growth model and a policy focus on agricultural intensification are internally consistent and could create a more enabling environment for land regularization that more strongly favors the conservation of natural lands over land grabbing and extensive agriculture. Conservation finance could provide further incentives.

To be effective, land regularization will first clarify the intention for undesignated areas, including the designation, mapping, demarcation, and registration of

FIGURE ES.6
Amazonas and Pará account for almost two-thirds of the undesignated land in Amazônia, 2019

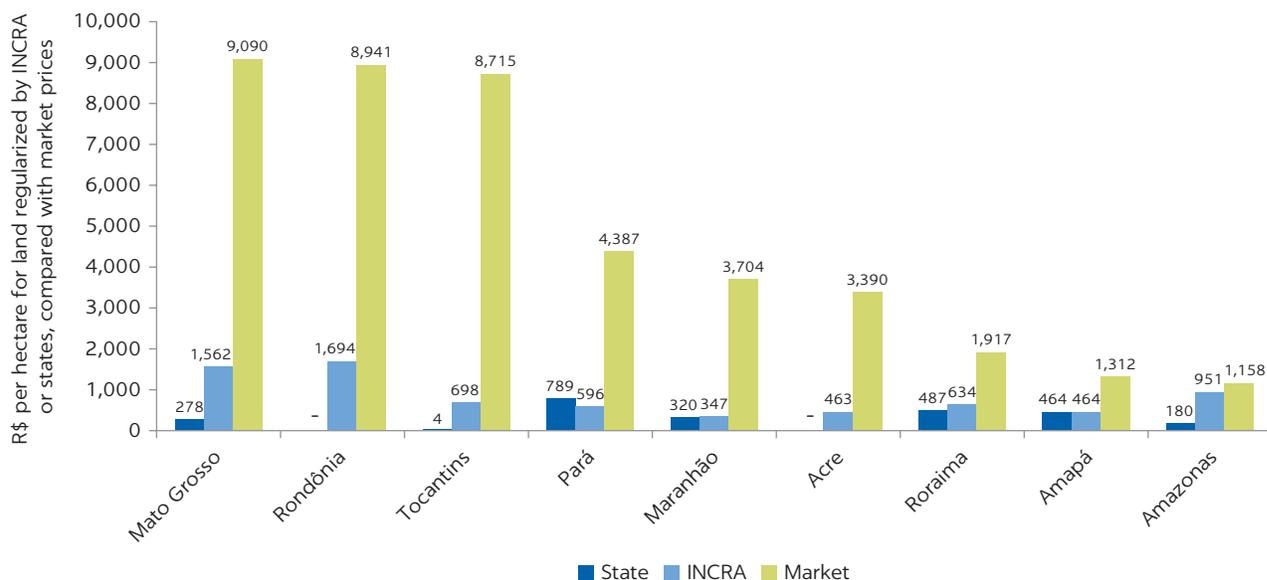


Source: World Bank, based on Brito et al. 2021.

Note: The figure shows hectares of undesignated areas in the Amazonian states. "Undesignated land" refers to public land awaiting designation as conservation units, Indigenous lands, agrarian reform settlements, land eligible for tenure regularization, or some other category of tenure.

FIGURE ES.7

There are significant implicit discounts in land regularization in Amazônia, 2019



Source: Modified from Brito et al. 2021.

Note: The figure compares values (in reais per hectare) of land regularized by the National Institute for Colonization and Agrarian Reform (INCRA) or by states with market prices. The comparison between average market values per hectare and bare land values is used as a basis for land sales by Amazonian state and state governments. - = data not available.

all federal and state proposed protected areas, Indigenous people's lands, agrarian reform settlements, and other public land categories. Completing this process would clarify property rights and raise the expected legal cost of land grabbing.

Second, both federal and state land adjudication entities should reduce the gap between the low (private) cost of access and the high (social) value of undesignated public lands.¹³ This can be achieved by adjusting statutory adjudication values closer to market values, assessing higher penalties for illegal deforestation on all public lands, halting changes to the cutoff year for valid unregularized tenure claims, and opening access to information on land tenure and market transactions to all public and private agents. In strengthening land administration and environmental institutions, federal and state governments should integrate land tenure and environmental regularization, giving special attention to equity. Because deforestation rates are much higher in areas without land tenure regularization, regularization should start with small-scale farmers in National Institute for Colonization and Agrarian Reform (INCRA) agrarian reform settlements, with complementary efforts to ensure environmental compliance.

Third, under the leadership of the federal government, Brazil should mandate the interoperability and integration of its multiple land cadastres, registries, and other land information systems.

Fourth, the government should invest in more accessible and simpler dispute resolution mechanisms and stricter enforcement of land tenure and use regulations. Simple alternative mechanisms for addressing disputes such as arbitration, mediation, and other administrative procedures can keep disputes out of the expensive, slow-moving, and often inaccessible court system. Enforcement should focus on credible penalties for illegal occupation and deforestation of land, document falsification, tax evasion, and registration of nonregularized land parcels in the CAR as a means of claiming ownership.

Strengthen compliance with forest laws

To enhance compliance, Brazil's Forest Code provides for a trading system for Environmental Reserve Quotas (Cotas de Reserva Ambiental, CRAs): landowners whose forest stock fell below the legal reserve minimum before 2008 would be able to cover their deficits by paying other landowners for maintaining an equivalent of forested area above the legal minimum. Operationalizing this system would reduce compliance costs across Brazil and is expected to reduce pressure on natural forests especially in Amazônia.

Command and control is another important tool to assure compliance. Environmental protection in Amazônia—if supported by strong political will to enforce it—can be enhanced by strengthening enforcement agencies and targeting resources to deforestation hot spots. In some cases, weak enforcement is due to institutional constraints, including inadequate resourcing and training of law enforcement agents and overlapping mandates. These shortcomings can be addressed through better resourcing, capacity training, and interagency collaboration. Recently, resources allocated to Brazilian forest law enforcement have been drastically cut (World Bank 2023a). It is imperative that this development be reversed. Ideally, these efforts should extend beyond Brazil's borders to achieve a regional approach to Amazonian protection.

Prioritizing municipalities with the highest deforestation rates can reduce deforestation more efficiently. At the same time, guarding against the danger that deforestation will be displaced to other areas is critical. Conservation finance could help shoulder associated costs and increase political will for better enforcement.

There are strong links between effective forest protection and protecting the integrity of Indigenous lands and livelihoods, which are all currently threatened by current patterns of resource exploitation in Amazônia.

Make value chains more sustainable

The private sector also has an important role to play in the conservation of Amazonian forests, including through effective environmental, social, and governance (ESG) standards. There is potential to strengthen and expand initiatives like the 2006 Amazon Soy Memorandum or the 2009 Zero Deforestation Cattle Agreement. In addition, companies should ensure that they source from sustainable suppliers. To aid this, monitoring and tracing systems should be strengthened, especially in the beef sector.

FOSTERING SUSTAINABLE RURAL LIVELIHOODS IN AMAZÔNIA

In Amazônia's rural areas, policy needs to be particularly sensitive to the local context. In the more consolidated agricultural areas where deforestation already occurred long ago, policy should focus on raising productivity by promoting innovation and value-added activities in established and emerging sectors; supporting a just strategy for climate change adaptation and mitigation (adoption of climate smart-agriculture, soil management, and recovery of degraded lands); and enabling the creation of value from ecosystem services (for example, biodiversity and carbon). The bioeconomy can play an important role in fostering sustainable rural livelihoods in the poorer and more remote areas of Amazônia.

Support the bioeconomy

The bioeconomy, unlocking the natural capital associated with the standing forest, is a small sector of the Amazonian economy. Besides sustainable extraction from the standing forest, the bioeconomy includes rural production like growing açai or cocoa and other nontimber forest products, nonforest production such as fisheries and aquaculture, and services like ecological tourism. Agroforestry production on private lands classified as legal reserves could also be considered as part of the bioeconomy, even though the exact scale of this practice remains unknown. It is a small sector but an important income source for many poor rural producers, including traditional communities. Bioeconomy production also holds considerable cultural value. Supporting these traditional livelihoods thus forms a key pillar of rural poverty reduction strategies.

The bioeconomy can also play a central part in Amazônia's structural transformation. As Amazonian farming professionalizes, smaller, less productive producers will come under increasing competitive pressure. To withstand this pressure, these producers may switch to more extensive production, notably cattle ranching, with strong incentives to turn forest into pasture, potentially illegally. It is thus a social and environmental priority to provide alternative intermediate pathways to such farmers, while future generations are more likely to look for jobs in cities. The bioeconomy offers such an alternative path.

Markets for sustainably produced forest products, as opposed to the same products produced as monocultures (for example, cocoa), remain small but they are growing. Especially if products are differentiated with a credible sustainability label, they can meet growing consumer demand for sustainable products and provide opportunities for bioeconomy producers. At the same time, however, such markets are bound to remain niche given the steep marginal cost curves of commodities sustainably extracted from the forest.

Strengthen social protection

Brazil's advanced social protection system (including social pensions and conditional cash transfer programs) will continue to be important in managing shocks in both urban and rural areas (whether from structural change, climate change, or other sources) and in alleviating poverty. Additional programs—perhaps modeled on the discontinued Program of Support to Environmental Conservation (Bolsa Verde) or the operating Forest Conservation Grant Fund (Bolsa Floresta) system in Amazonas State—may be warranted to preserve traditional ways of life in Amazônia. They can maintain standards of living in traditional communities as Amazônia undergoes structural change.

Strengthening social protection programs alone cannot curb Amazônia's large-scale deforestation but should be part of a broader development approach. Bolsa Verde generally operated in areas with lower risk of deforestation, and reductions in deforestation due to the program are estimated to be small (Wong et al. 2018). Bolsa Floresta's impacts on deforestation were also evaluated as limited (Cisneros et al. 2019). Targeting such programs more to deforestation hot spots may help reduce illegal deforestation by limiting the destitution that could fuel illegal behavior. A key challenge is that conditioning them on deforestation reduction would put beneficiaries, who tend to be among the most vulnerable communities, in direct conflict with illegal loggers, especially in a region where law enforcement is weak.

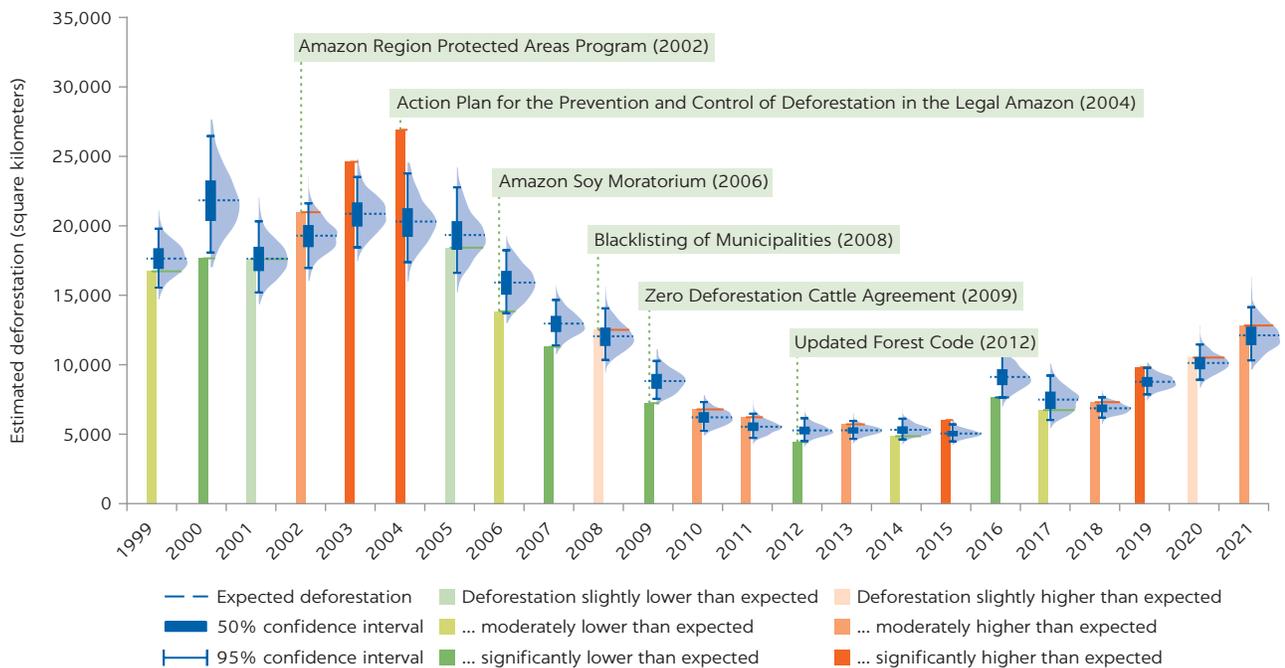
MARSHALING CONSERVATION FINANCE FOR AMAZÔNIA

Fostering sustainable and inclusive development in Amazônia requires innovative financing. Conservation finance is one source that leverages public and private resources or market mechanisms for climate finance, both domestic and international. Public resources can be motivated by the global public-goods value of standing Amazonian forests. Although such financing would focus on efforts to curb deforestation, it could also more broadly support a more sustainable and inclusive development model.

Most deforestation in Amazônia today is illegal, so financing could support governments in command and control efforts or land regularization. Focusing on governments and their jurisdictions is particularly important since deforestation can “leak” across territories, meaning that interventions successfully reducing deforestation in one area may inadvertently increase it in another. Amazonian governments’ achievements in reducing deforestation could be rewarded with conservation finance, generating both resources and political will to protect forests, and conservation finance could support both direct protection efforts and policies aimed at sustainable and inclusive development.

To condition conservation finance on measurable reductions in deforestation at the jurisdictional level, a counterfactual is required: how much deforestation would have occurred if not for government efforts? Brazil’s real effective exchange rate (a measure of the competitiveness of Brazil’s commodities) and commodity prices (a measure of their demand) approximate Amazonian deforestation well (figure ES.8) and could thus be used to construct such a counterfactual.

FIGURE ES.8
Estimating “forest at risk” in Amazônia using macroeconomic indicators and accounting for policy action to curb deforestation



Source: Wang, Gurhy, and Hanusch 2022.

Note: The green and red bars show the level of observed deforestation, and the blue dashed horizontal lines show the estimated level of deforestation with bootstrapped confidence intervals. The model uses lagged commodity prices and the lagged real effective exchange rate, which were identified as the most important predictors using regularization methods. The flags show how various policy interventions coincided with statistically significantly lower levels of deforestation, which can be attributed to policy effectiveness.

When economic forces increase pressure on forests, governments require more resources to maintain the same level of deforestation, and linking the baseline to economic indicators would enable this. Because sufficient productivity growth will lead to a long-term appreciation of the real exchange rate, and because conservation finance helps consolidate forest governance, improving productivity and governance could ensure that deforestation pressures in Amazônia eventually moderate, potentially reducing the overall need for conservation finance.

Linking conservation finance to verifiable outcomes may make it more effective in raising adequate resources to prevent deforestation and promote development in Amazônia. Brazil already has experience tying financing to environmental performance: the Ecological Tax on the Circulation of Goods and Services (ICMS Ecológico) earmarks state tax revenues for well-performing municipalities. Because of the global public-goods nature of Amazônia's forests, there is also a strong case for international financing, for example through initiatives like the Amazon Fund. Generally, there is significant willingness in many countries to contribute to conserving especially the Amazon rainforest, particularly when linked to verifiable outcomes.

A broad range of market-based financing could be leveraged to raise conservation finance for Amazônia if clearly conditioned on slowing deforestation. Specific instruments include green bonds and loans, sustainability-linked bonds, and forest offsets as part of Brazilian or even global carbon markets. In fact, forest offsets are one of the main sources of carbon credits in global voluntary markets, and Brazil already has experience with selling them. Such financial instruments can be further supported by international development finance, through institutions like the World Bank. Beyond voluntary markets, forest credits could be linked to a Brazilian compliance market if the country were to introduce a carbon pricing mechanism like an emissions trading system (for which there is currently significant momentum in Brazil) or a carbon tax.

TOWARD SUSTAINABLE AND INCLUSIVE DEVELOPMENT ON THE AMAZONIAN FRONTIER

Development in Amazônia is a complex challenge, requiring concerted action at the global, national, and local levels (table ES.1). Amazônia belongs to Brazil, but because its forests have global implications, efforts to help preserve them should be shared globally as well. Curbing emissions from land use change would allow Brazil to meet its climate commitments and, since Brazil is otherwise a rather green country with a low-carbon energy matrix, it could unlock major opportunities from global decarbonization trends, from trade in green products to international carbon markets (World Bank 2023a). The timing of different interventions matters and can raise the overall effectiveness of complementary policy packages, guarding against unintended consequences.

Shared efforts

At the global level, but also in Brazil and Amazônia, more sustainably minded consumers, firms, and governments remain central to efforts to rid supply chains and global trade of production that contributes to deforestation. Less-resource-intensive diets will reduce pressure on natural forests, while closing crop yield gaps in the world and across Brazil will limit the demand for frontier expansion

TABLE ES.1 Shared efforts to support sustainable and inclusive development in Amazônia at the global, national, and local levels

OBJECTIVE	GLOBAL LEVEL	NATIONAL LEVEL	AMAZÔNIA
<i>Global sustainable demand and supply</i>			
Consuming more sustainably	✓	✓	✓
Closing crop yield gaps	✓	✓	Yes, guarding against the Jevons effect ^a
Promoting sustainable trade integration	✓	✓	
<i>Balanced structural transformation across Brazil</i>			
Removing distortions in product and factor markets		✓	✓
Fostering sustainable infrastructure and logistics and strengthening urban networks and municipal services in rural and urban areas		✓	✓
Reforming implicit incentives to extensive agriculture (including rural credit and land taxes) and foster climate-smart agriculture		✓	✓
Strengthening human capital		✓	✓
<i>Improved forest protection in Amazônia</i>			
Accelerating land regularization		Yes, for federal lands in Amazônia	✓
Strengthening law enforcement, including forest governance		Yes, for relevant federal agencies and regional collaboration	✓
Avoiding deforestation, promoting reforestation, and restoring degraded lands		Yes, for example, through the CRAs	Yes, guarding against deforestation leakage
<i>Sustainable rural livelihoods in Amazônia</i>			
Strengthening the bioeconomy			✓
Tailoring social protection			✓
<i>Conservation finance</i>			
Providing financing	✓	✓	✓
Receiving financing		Yes, for federal efforts in Amazônia	✓

Source: World Bank.

a. The “Jevons effect” refers to “intensification inducing extensification,” whereby agricultural productivity gains locally increase deforestation. CRAs = Environmental Reserve Quotas (Cotas de Reserva Ambiental).

(Searchinger et al. 2019). Conservation finance should benefit Amazônia but can, in theory, be raised anywhere in the world.

The productivity agenda is a shared one between Amazônia and the rest of Brazil. Factor accumulation and resource exploitation are no longer sufficient to propel development anywhere in Brazil; a much stronger emphasis on productivity, notably in sectors beyond commodities, will be critical for this, promoting more balanced structural transformation across the country. This agenda includes removing market distortions, fostering sustainable infrastructure and logistics, strengthening human capital investments, and repurposing implicit incentives to extensive agriculture and putting them at the service of climate-smart production and productivity. Within Amazônia, federal and

subnational efforts should focus on promoting socioeconomic progress while protecting the region's exceptional natural and cultural wealth.

Policy timing and complementarities

Close attention should be paid to the particular characteristics of Amazônia as a frontier region, where both economies and institutions still tend to be relatively new (with the exception of traditional institutions) and require both time and dedicated efforts to mature. Maturity is already higher in some parts of Amazônia, notably in the southeastern part of the region.

Policies focused on institutional and economic maturity are complementary. For example, public investments in education raise economic growth, which generates job opportunities that make it more worthwhile for families to invest in education. Other examples apply to economic development and forest protection. For one, effective forest protection will release resources from extensive agriculture into more productive activities, including in urban areas. Recognizing that Amazônia's population is largely urban could help generate political will to promote productivity to generate more urban jobs. Jointly, effective forest protection and balanced structural transformation across agriculture and urban sectors will contain risks around the Jevons effect, intensifying agriculture and promoting both economic development and standing forests.

Gaining maturity is time-consuming, but protecting Amazônia's forests is urgent. This makes it particularly important to focus efforts and resources, including conservation finance, on land and forest governance. The foundations must be laid in states with low maturity while quickly closing gaps in states with overall higher maturity but nonetheless high levels of deforestation, such as those in the Arc of Deforestation. More gradually, all institutions must be strengthened—from education systems to municipal services to policing and judicial services—raising the overall level of institutional maturity across Amazônia.

Achieving balanced structural transformation is critical to strengthening economic maturity, and this transformation requires investments in productivity, including in urban productivity. For as long as rural poverty is high and urban areas struggle to absorb rural labor, investing in rural livelihoods and providing rural basic services will remain particularly important. Policy should support rural transformation by promoting sustainable, climate-smart rural production practices, including in the bioeconomy, while preparing rural populations for opportunities from the structural transformation and urbanization process. To ensure that traditional communities are not adversely affected by economic disruption (or other shocks, such as from climate change), social protection systems should protect their incomes and sustainable ways of life.

Certain policies promoting economic growth will become less risky to Amazônia's ecosystems when overall maturity is higher. These include trade agreements, especially if they disproportionately stimulate Brazilian agriculture. They also include transport infrastructure investments that raise the external competitiveness of Amazonian farmers—which, under higher overall maturity, is less likely to cause deforestation.

At the same time, certain policies directly rewarding higher forest cover are more efficient when maturity is higher: deforestation leakage is a lesser risk when effective governance suppresses land grabbing and illegal deforestation and when more balanced structural transformation reduces overall

deforestation pressures. In these cases, policies incentivizing private agents to spare forested land, to reforest land, or to restore degraded farmland are less likely to be offset by higher deforestation in other areas, making the policies more efficient.

This memorandum suggests that an Amazônia that is rich economically, environmentally, and culturally is possible—but time is running out, and urgent action is needed to make it a reality. It requires a rebalancing of Amazônia's development approach.

NOTES

1. Data are from Brazilian Institute of Geography and Statistics (IBGE) population estimates.
2. Poverty data are from the World Bank, based on IBGE's Continuous National Household Sample Survey (PNADC) 2019 data and a poverty line of US\$5.50 in purchasing power parity terms.
3. "Option value" refers to the prospective value of pharmaceutical innovation from the harvest of the biosphere's genetic resources, and "existence value" to the values attached to having the resources available to current and future generations.
4. Annual deforestation data are from the Project for Satellite Monitoring of Deforestation in the Legal Amazon (PRODES) of the National Institute for Space Research (INPE).
5. Unemployment data are from the World Bank, using PNADC 2019 data.
6. Poverty and population data are from the Socio-Economic Database for Latin America and the Caribbean (SEDLAC).
7. Data on public service provision and housing conditions, by demographic category, are from the IBGE's 2019 PNADC. Also see chapter 2, table 2.3.
8. Urban housing data are from the World Bank, using IBGE (2020).
9. An integrated landscape approach is one in which the organizing principle for management of production systems and natural resources is based on rational spatial planning and takes into account socioeconomic, ecological, and institutional considerations. It includes the integration of different agricultural activities, such as crop-livestock or crop-livestock-forestry systems, to maximize ecosystem services.
10. The Low Carbon Agriculture (Agricultura de Baixa Emissão de Carbono, or ABC) Plan promotes low-carbon agriculture.
11. One critical ingredient includes proper certification of beef.
12. Data on access to municipal services are from IBGE's 2019 PNADC. Also see chapter 2, table 2.3.
13. For equity reasons, land parcels below a certain threshold could be exempted.

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Brazil's nine Amazonian states, here collectively referred to as Amazônia, include some of the world's richest ecosystems, including the Amazon rainforest and parts of the Cerrado savanna and Pantanal wetlands. The region is also among Brazil's poorest socioeconomically. As a result, sustainable, inclusive development of Amazônia calls for raising living standards while protecting natural forests. *A Balancing Act for Brazil's Amazonian States: An Economic Memorandum* explores how a recalibrated development approach can achieve these goals.

In the shorter term, there is an urgent need to halt deforestation—a massive destruction of natural wealth that poses risks to the climate and economy. Amazônia is Brazil's deforestation hot spot, and the Amazon rainforest is approaching tipping points into broad and permanent forest loss. Reversing the recent increase in deforestation requires stronger land and forest governance, including land regularization and more effective law enforcement.

In the longer term, both Brazil and Amazônia need a new growth model. This model would be anchored in productivity rather than resource extraction and it would diversify the export basket beyond commodities. A more balanced structural transformation requires the lagging urban sectors, such as manufacturing and services, to step up to promote economic growth, reduce pressure on the agricultural frontier, and generate jobs for Brazil and Amazônia's largely urban populations.

The public-good value of Amazônia's forests could generate conservation finance linked to verifiable reductions in deforestation. Such financing would support a new development approach, combining forest protection, productivity, balanced structural transformation, sustainable production techniques (including the bioeconomy), and other measures to address the needs of Amazônia's urban and rural populations. This approach must also heed the needs and interests of Amazônia's traditional communities.

Given both the value and the fragility of Amazônia's ecosystems, coupled with considerable socioeconomic local needs, the stakes are high—for Amazônia, Brazil, and the world.