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THE FIVE AMAZONS

BASIS FOR THE SUSTAINABLE DEVELOPMENT OF THE BRAZILIAN AMAZON



AMAZONIA
2030

THE AMAZON REGION HAS FIVE VAST, DIVERSE, AND HETEROGENEOUS ZONES. EACH ONE OF THEM REQUIRES ITS OWN PORTFOLIO OF PUBLIC POLICIES TO THRIVE

The Brazilian Amazon covers about 5 million square kilometers (59% of Brazil), with significant socioeconomic and natural differences within its territory. Although complex and heterogeneous, the Brazilian Amazon can be divided into five major zones based on the remaining vegetation cover. In turn, each of these zones is associated with specific public policies for it to thrive.

We adopted the methodology originally developed by Imazon in 2007⁽¹⁾ for defining such zones, in which each of the 772 municipalities in the Brazilian Amazon was classified based on vegetation cover and deforestation. This analysis produced four major zones: zone 1, *"The Forested Brazilian Amazon"*, zone 2, *"The Brazilian Amazon with Forest Under Pressure"*, zone 3, *"The Deforested Brazilian Amazon"* (that is, originally forested, but that have lost a large part of its forest), and zone 4, *"The Non-Forested Brazilian Amazon"* (the vast majority of this area is covered by savanna-type vegetation and natural grasslands). We recently updated this analysis to incorporate new deforestation data available through the National Institute for Space Research's (INPE) Prodes Project⁽²⁾ and to define a fifth major zone: zone 5, *"The Urban Brazilian Amazon"* (Figure 1).

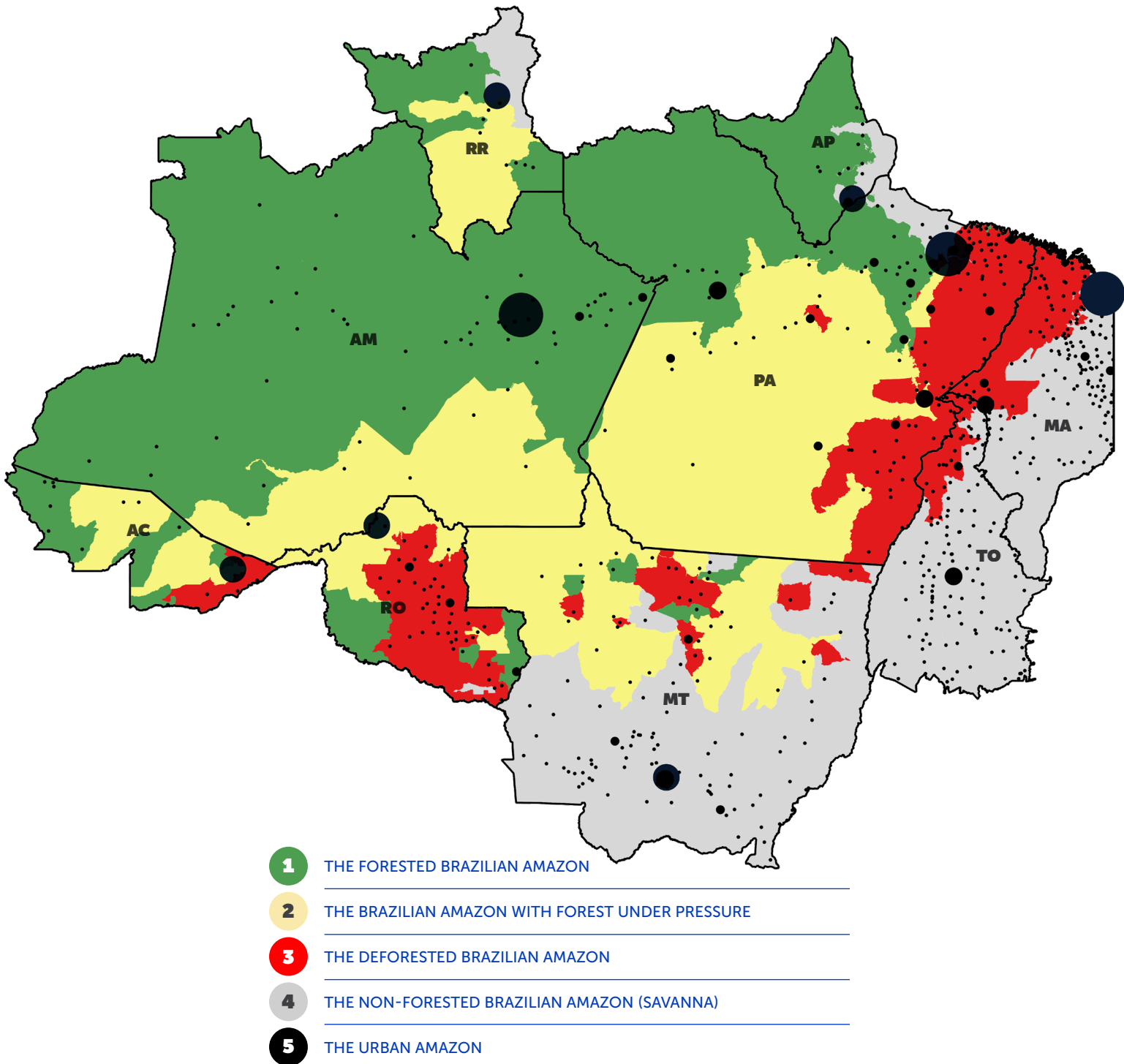
The zone 4, *"The Non-Forested Brazilian Amazon"* is comprised of municipalities whose original vegetation cover was mostly savannas. The other four zones correspond to municipalities that originally had more than 50% of their territory covered by forests. Considering these four zones, zone 3, *"The Deforested Brazilian Amazon"*, corresponds to municipalities that have lost more than 70% of their original forest, excluding Protected Areas (Conservation Units and/or Indigenous Lands). In contrast, zone 1 *"The Forested Brazilian Amazon"*, is comprised of municipalities that lost less than 5% of their original forest cover. The municipalities in zone 2, *"The Brazilian Amazon with Forest Under Pressure"*, retain large forest cover (>75% of their territory is still forest) but recently have been undergoing an accelerated process of deforestation. To define areas belonging to zone 5, *"The Urban Brazilian Amazon"*, we rely on the criteria used by the Brazilian Institute of Geography and Statistics (IBGE) on the location of urban centers and the population residing in these areas⁽³⁾.

(1) <https://imazon.org.br/publicacoes/o-avanco-da-fronteira-na-amazonia-do-boom-ao-colapso/>

(2) <http://www.obt.inpe.br/OBT/assuntos/programas/amazonia/prodes>

(3) <https://sidra.ibge.gov.br/pesquisa/pnadca/tabelas>

FIGURE 1 • THE FIVE ZONES OF THE BRAZILIAN AMAZON



Source: Adapted from Celentano & Verissimo (2007) based on data from IBGE (territorial area and population) and INPE (vegetation cover and deforestation)



The public policies recommendations for each of the zones are not mutually exclusive. Some of the proposals can be adopted in all zones, such as participation in the forest carbon market through the REDD+ mechanism (Reducing Emissions from Deforestation and Forest Degradation) and the creation and consolidation of Protected Areas.

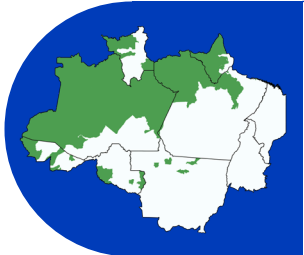
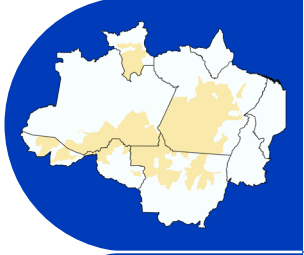
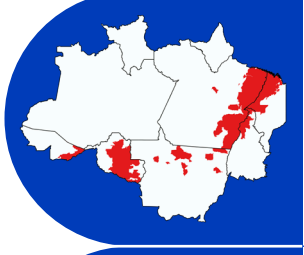

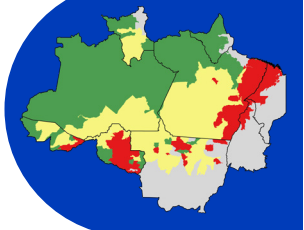
In turn, forest restoration (planting of native trees) is more suitable in the **deforested** and **forested under pressure zones**. Improving agricultural productivity is a key action throughout the Brazilian Amazon, but it is a priority especially in the deforested zone.

In the **forest under pressure zone** the priority must be to fight illegal land grabbing of public forests⁽⁴⁾. Enforcement of laws against deforestation and forest degradation (predatory logging, forest fires, etc.), although necessary throughout the Brazilian Amazon, are more needed⁽⁵⁾ in the **forest under pressure** and in the **deforested zones**.

(4) <https://amazonia2030.org.br/propostas-para-um-ordenamento-territorial-na-amazonia-que-reduza-o-desmatamento/>

(5) <https://oeco.org.br/salada-verde/governo-atualiza-lista-de-municipios-que-mais-desmatam-a-amazonia/>

PROFILE OF THE BRAZILIAN AMAZON ZONES

	ZONES AND TERRITORIAL AREA	POPULATION (2021)	FOREST AREA COMPARED TO ORIGINAL FOREST COVER		NON-FORESTED AREA COMPARED TO ORIGINAL SAVANNAS COVER	
			Forest in 2021 (%)	Deforestation up to 2021 (%)	Non-forest in 2021 (%)	Deforestation up to 2021 (%)
	<p>THE FORESTED BRAZILIAN AMAZON</p> <p>1,996,540 km²</p> <p>39%</p>	6,281,683	96	4	99	1
	<p>THE BRAZILIAN AMAZON WITH FOREST UNDER PRESSURE</p> <p>1,483,100 km²</p> <p>29%</p>	3,282,561	81	19	93	7
	<p>THE DEFORESTED BRAZILIAN AMAZON</p> <p>547,262 km²</p> <p>11%</p>	9,052,133	34	66	76	24
	<p>THE NON-FORESTED BRAZILIAN AMAZON</p> <p>1,041,146 km²</p> <p>21%</p>	9,803,335	44	56	72	28
	<p>TOTAL BRAZILIAN AMAZON</p> <p>5,068,048 km²</p> <p>100%</p>	28,419,712	79	21	76	24

Source: Based on data from IBGE (territorial area and population) and INPE (vegetation cover and deforestation).

*Zone 5, The Urban Amazon, is included in the four others zones

THE FORESTED BRAZILIAN AMAZON

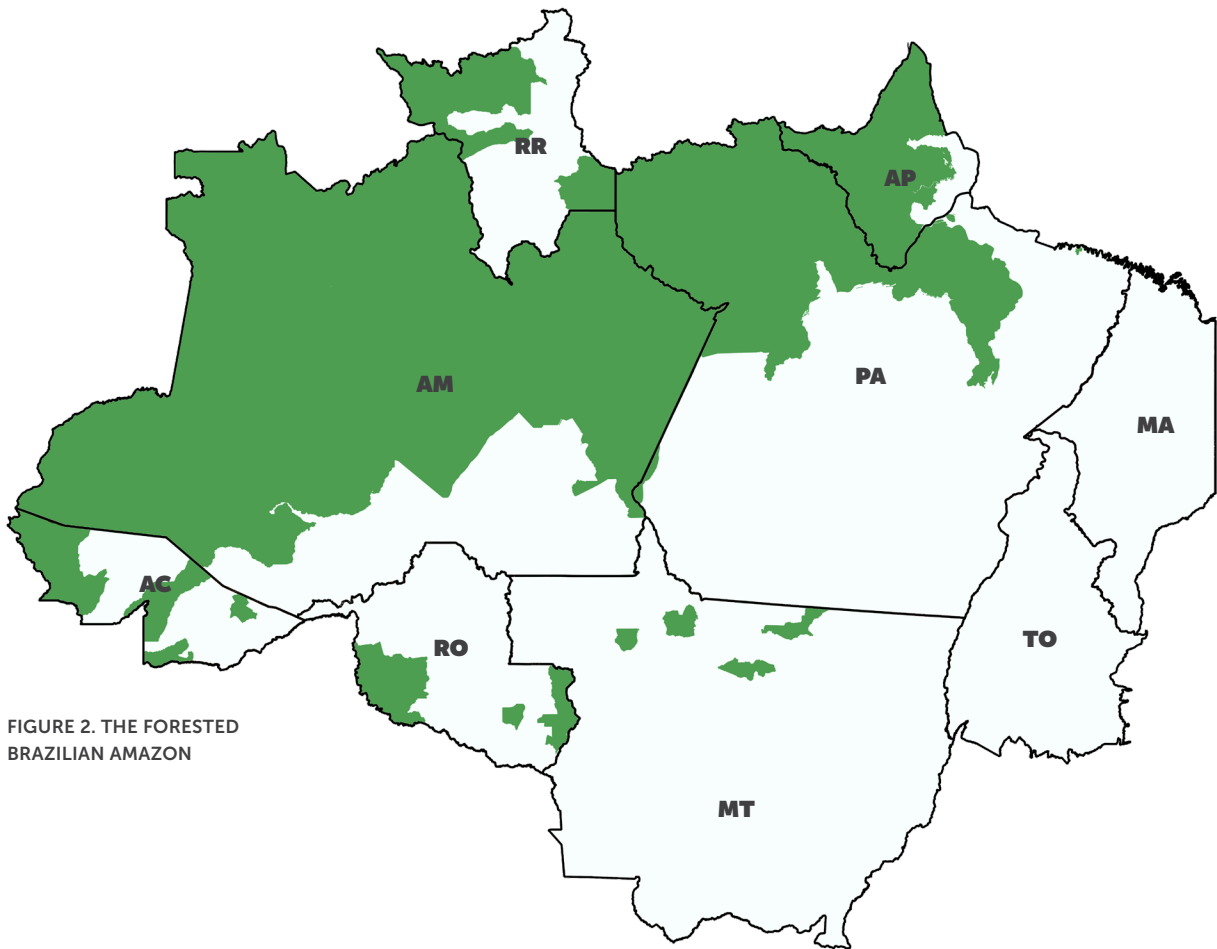


FIGURE 2. THE FORESTED BRAZILIAN AMAZON

THE **FORESTED BRAZILIAN AMAZON** (FIGURE 2) OCCUPIES 39% OF THE BRAZILIAN AMAZON AND CONTAINS THE LARGEST TRACTS OF CONSERVED AREAS.

In this zone, priority must be given to forest conservation that also creates social and economic gains. This approach includes supporting the bioeconomy and investing in payments for environmental services with a focus on REDD+⁽⁶⁾. Moreover, it is possible to increase exports of forest-friendly products such as açai and other tropical fruits, Brazil nuts, agroforestry products (such as cacao and black pepper) as well tropical fish. (Figure 3). The Brazilian Amazon – which represents one third of the world’s tropical forests – has a tiny share of the global market for such products (less than 0.2%), which generates worldwide revenues of over USD 170 billion a year and it is expanding⁽⁷⁾.

(6) <https://amazonia2030.org.br/oportunidades-financeiras-para-obrasil-com-a-reducao-dodesmatamento-na-amazonia/>

(7) <https://amazonia2030.org.br/oportunidades-para-exportacao-de-produtos-compativeis-com-a-floresta-na-amazonia-brasileira/>

FIGURE 3 • PRIORITIZE THE FOREST BIOECONOMY

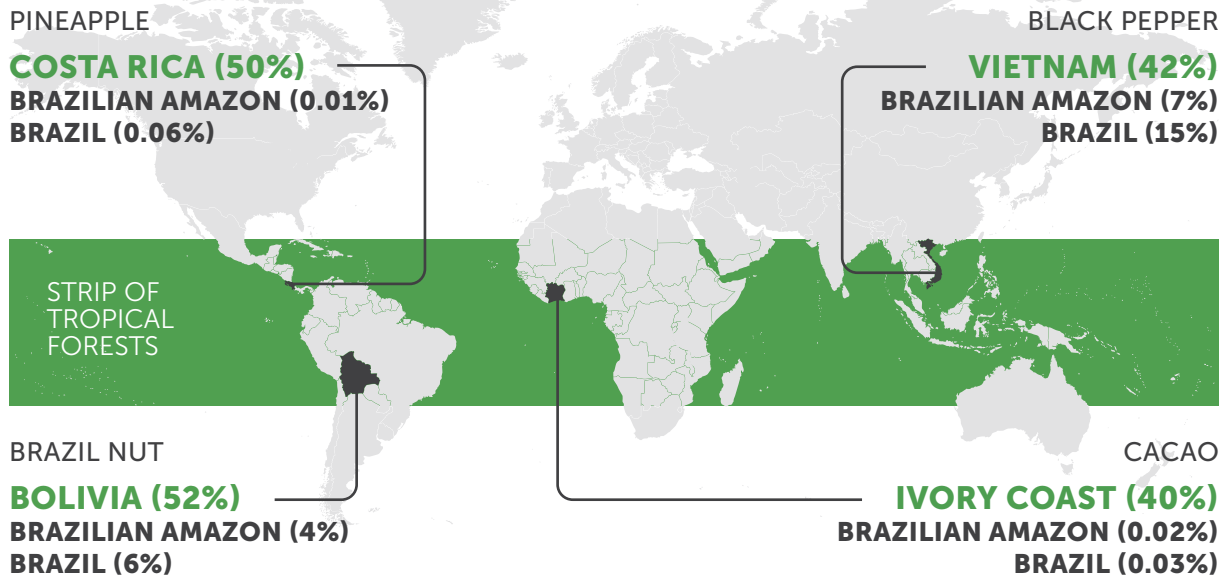
Investing in forest-friendly products compatible with the standing forest generates wealth, adds value, and helps protect the forest



5

COMPETITORS

And their market share in exports



Source: AMZ 2030, adapted from Coslovsky (2021)

“The Forested Brazilian Amazon” needs to improve its infrastructure without opening new major roads, as roads can promote disorderly occupation, social conflicts, and deforestation. The challenges associated with access and logistics can be overcome through improvements in the wide network of navigable rivers in the region.



It is also necessary to invest in the supply of energy of this area via renewable energy, as part of the **forested Amazon** still depends exclusively on fossil fuel to generate energy⁽⁸⁾. Lastly, this zone suffers from poor internet quality. Therefore, it is essential to invest in broadband internet infrastructure in this zone and throughout the Brazilian Amazon.

BOX 1 • BENEFITS OF THE INTERNET IN THE BRAZILIAN AMAZON

POTENTIAL FOR INCREASING
income and employment opportunities via remote work and entrepreneurship (digital business) even in more remote regions

INCREASING ACCESSIBILITY
for the region without the socio-environmental risks associated with opening new roads in forest regions

IMPROVING AND EXPANDING
education, health services (telemedicine), technical assistance for rural extension, public social

BOX 2 • PROTECTED AREAS

PROTECTED AREAS ARE COMPOSED OF CONSERVATION UNITS (NATIONAL PARKS, BIOLOGICAL RESERVES, NATIONAL FORESTS, EXTRACTIVIST RESERVES, ETC.) AND INDIGENOUS LANDS. The National Strategic Plan for Protected Areas (PNAP) recognizes that Indigenous Lands contribute to environmental conservation and must be protected. The strengthening of Protected Areas requires enforcement, improved management, and ensuring funds to implement programs. It is also essential to strengthen the National Foundation for Indigenous Peoples (FUNAI) to protect indigenous peoples, as well as strengthen and implement the National Policy for Territorial and Environmental Management of Indigenous Lands (PNGATI).

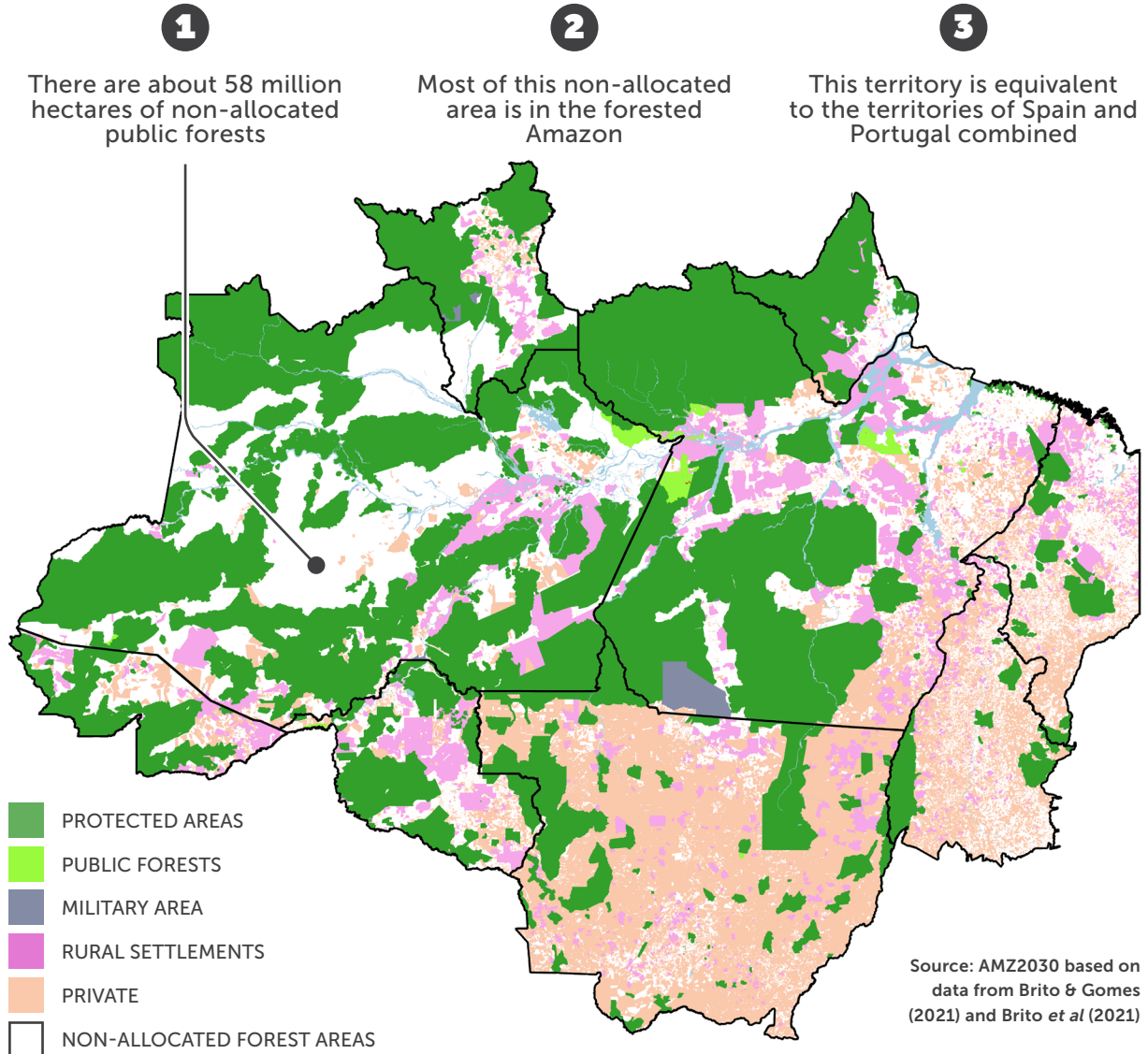
“The Forested Brazilian Amazon” contains most of the non-allocated Brazilian public forests, adding up to more than 580 thousand square kilometers, the equivalent of the territories of Spain and Portugal combined. These forests are located especially in the western part of the Brazilian Amazon and need to be legally protected from land grabbing and deforestation⁽⁹⁾ (Figure 4). The answer lies in the creation of Protected Areas. The creation of these areas will make it possible to protect the forest and, at the same time, obtain revenue from payments for environmental services and forest-based businesses (timber forest products under forest management and non-timber forest products).

(8) <https://amazonia2030.org.br/a-atuacao-do-bndes-na-amazonia-legal/>

(9) <https://amazonia2030.org.br/oportunidades-financeiras-para-brasil-com-a-reducao-dodesmatamento-na-amazonia/>

(9) <https://amazonia2030.org.br/destinacao-de-florestas-publicas-um-meio-de-combate-a-grilagem-e-ao-desmatamento-ilegal-na-amazonia/>

FIGURE 4 • CREATE AND STRENGTHEN PROTECTED AREAS IN NON-ALLOCATED PUBLIC FORESTS



Establishing Protected Areas means giving purpose to non-allocated public forests

- | | | |
|-------------------|----------|--|
| STRENGTHEN | 1 | Conservation Units through the expansion of the Program Protected Areas in the Amazon (ARPA) and other similar initiatives |
| EXPAND | 2 | The FUNAI's budget and scope of work in Indigenous Lands |
| PRIORITIZE | 3 | The implementation of the National Policy for Territorial and Environmental Management of Indigenous Lands (PNGATI) |
| CREATE | 4 | New Indigenous Lands or Conservation Units |



RECOMMENDATIONS FOR THE FORESTED BRAZILIAN AMAZON

The forest-based economy and biodiversity conservation are the main avenues for sustainable development in this region

- Prioritize the bioeconomy
- Promote REDD+ credits
- Maintain existing Protected Areas
- Create Protected Areas in non-allocated public forests
- Evaluate the impact of new infrastructure
- Strengthen river transport network
- Invest in renewable energy
- Expand broadband internet access

THE BRAZILIAN AMAZON WITH FOREST UNDER PRESSURE

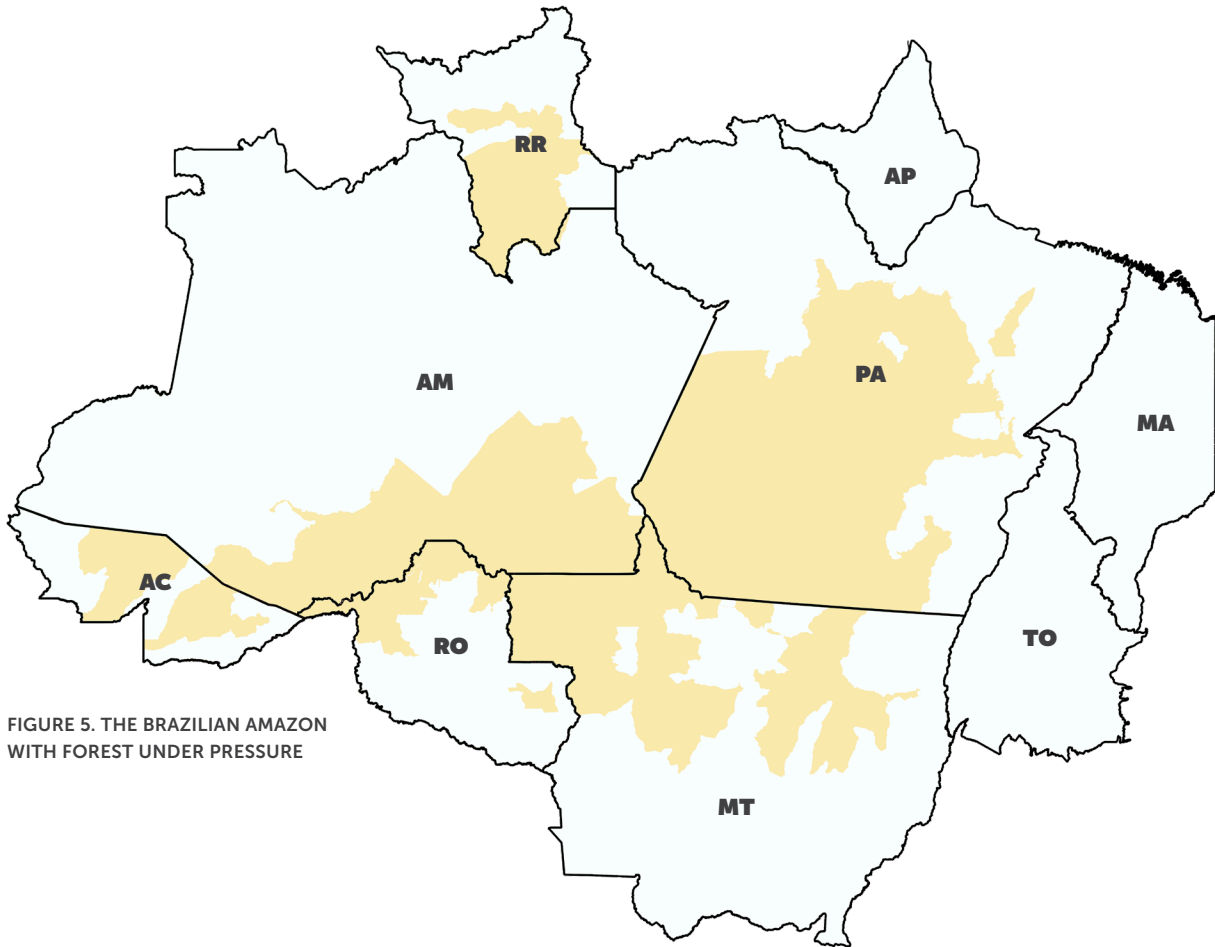


FIGURE 5. THE BRAZILIAN AMAZON WITH FOREST UNDER PRESSURE

THIS ZONE (FIGURE 5) COVERS 29% OF THE BRAZILIAN AMAZON AND CORRESPONDS TO MUNICIPALITIES WITH EXTENSIVE FOREST COVERAGE AND THAT SUFFER FROM INCREASING DEFORESTATION, ILLEGAL LOGGING AND LAND GRABBING.

There are three fundamental priorities for this zone. First, coordinated command and control efforts should curb deforestation and forest degradation through illegal logging and forest fires. Second, it is essential for territorial regulation to advance on two fronts, firstly by avoiding changes in the land use legal framework that could encourage the illegal occupation of public forests. Secondly, transforming public forests into Protected Areas will ensure their integrity. The zone's third priority is to offer technical assistance and loans, especially to small-scale farmers, in order to promote better land use in already deforested areas.



There are good opportunities in the region both for the intensification of agriculture and for the improvement and expansion of agroforestry systems for the cultivation of crops such as cacao⁽¹⁰⁾.

BOX 3 • FIGHT DEFORESTATION AND FOREST DEGRADATION: THE PPCDAM PROGRAM⁽¹¹⁾

BRAZIL HAS THE KNOW-HOW TO FIGHT DEFORESTATION AND ENVIRONMENTAL CRIMES IN THE AMAZON. It will be key to restore the Action Plan for the Prevention and Control of Deforestation in the Amazon (known as PPCDAm) and to incorporate new approaches including traceability and the monitoring of forest degradation. Moreover, the National Environmental System (Sisnama) must be strengthened.

THE NEW PLAN TO COMBAT DEFORESTATION MUST RESTORE THE PPCDAM PROGRAM AND INCLUDE NEW TECHNOLOGIES AND APPROACHES

RESTRUCTURE AND STRENGTHEN

- Restore environmental control and the ground enforcement
- Conduct regular inspections in the field
- Combat illegal occupation
- Create financial incentives for compliance with environmental standards
- Monitor secondary vegetation

EXPLORE AND INNOVATE

- Combat organized crime
- Fight forest degradation
- Strengthen the Sisnama
- Develop specific strategies for agrarian reform settlements
- Track supply chains

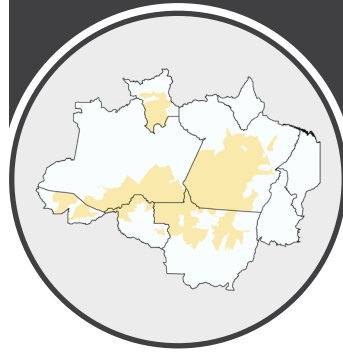
BOX 4 • LAND REFORM SETTLEMENTS IN THE BRAZILIAN AMAZON

THE LAND REFORM SETTLEMENTS ADD UP TO AN AREA OF 370 THOUSAND SQUARE KILOMETERS (AN AREA EQUIVALENT TO JAPAN). These settlements are home to about 526,000 families⁽¹²⁾. There are settlements originating from the agricultural colonization projects of the 1970s that are in the deforested Amazon zone as well as settlements created more recently which are located in *the Forested Amazon zone*. Therefore, solutions for settlements must consider these differences. For example, in settlements located in the deforested Amazon, it is recommended to prioritize the improvement of agricultural productivity and agroforestry systems. Moreover, there are opportunities for forest restoration. Payments for forest conservation via REDD+ would help families in predominantly forested settlements.

(10) <https://amazonia2030.org.br/cacau-fino-ou-commodity-opcoes-para-a-amazonia/>

(11) <https://amazonia2030.org.br/politicas-publicas-para-protecao-da-floresta-amazonica-o-que-funciona-e-como-melhorar/>

(12) <https://amazonia2030.org.br/assentamentos-rurais-da-amazonia-diretrizes-para-a-sustentabilidade/>



RECOMMENDATIONS FOR THE BRAZILIAN AMAZON WITH FOREST UNDER PRESSURE

Brazil needs to resume
defense of the Amazon forests
under pressure

- Fight deforestation and forest degradation
- Create Protected Areas in non-allocated public forests
- Prevent illegal grabbing of public forests
- Support the implementation of Conservation Units
- Support the protection of Indigenous Lands
- Halt illegal gold mining
- Combat illegal logging
- Support sustainable forest management
- Promote the expansion of agroforestry systems
- Support low-carbon agriculture

THE DEFORESTED AMAZON

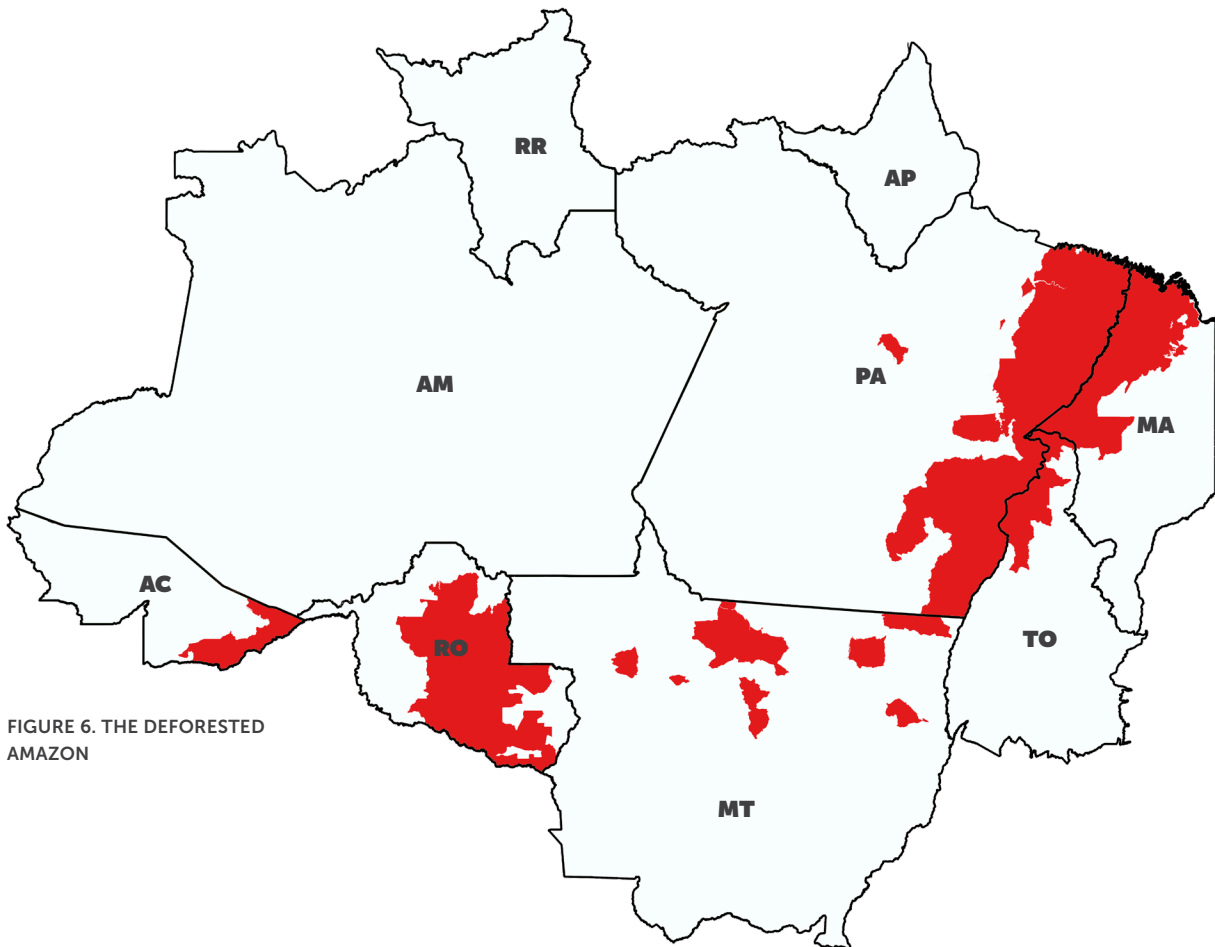


FIGURE 6. THE DEFORESTED AMAZON

MUNICIPALITIES LOCATED IN ZONE ***“THE DEFORESTED AMAZON”*** ACCOUNT FOR ABOUT 11% OF THE TOTAL AREA OF THE BRAZILIAN AMAZON (FIGURE 6). FOR THE MOST PART, DEFORESTED AREAS IN THIS ZONE HAVE BEEN SUBSEQUENTLY ABANDONED OR REMAIN UNDERUSED.

Despite the high rate of deforestation that characterizes zone ***“The Deforested Amazon”***, this zone still harbors a substantial remnant of forest, although some of these areas have already suffered some level of degradation due to predatory logging.

Areas in ***“The Deforested Amazon”***, have been occupied since 1970s and have a wider network of roads than the rest of the region.

There are four main priorities for this zone. First, it is important to emphasize land tenure regularization according to prevailing Brazilian law, which will create the foundation for improving the business and investment environment in the rural area.



Second, it is necessary to improve the quality of infrastructure (roads and internet) and education and health care services, especially in municipalities with low social development indicators⁽¹³⁾.

Third, it is possible to significantly expand agricultural production without additional deforestation. This possibility exists because there are more than 84 million hectares⁽¹⁴⁾ that have already been deforested in the Amazon, of which more than 70% are formed by areas of low livestock productivity or that have been abandoned⁽¹⁵⁾ (Figure 7).

Fourth, there are excellent opportunities for forest restoration (regeneration of secondary vegetation and planting of native trees) in deforested areas⁽¹⁶⁾ and for reforestation (planting of fast-growing trees) linked to the paper and pulp sector (Figure 8).

BOX 5 • FOREST RESTORATION

THERE ARE TWO GENERAL WAYS OF CARRYING OUT RESTORATION: ACTIVE PLANTING OF SEEDLINGS OF NATIVE TREE SPECIES IN DEFORESTED AREAS OR ALLOWING FOR NATURAL REGENERATION OF DEFORESTED AREAS THAT HAVE BEEN ABANDONED.

With relatively modest investments, it is possible to restore the forest and receive payment for carbon capture. The Brazilian Amazon, with its abundance of abandoned and/or underutilized deforested areas, can take advantage of this opportunity in the carbon capture market via forest restoration.

BOX 6 • REDD+

REDUCING DEFORESTATION CAN ATTRACT NEW FLOWS OF INVESTMENT FOR THE BRAZILIAN AMAZON. ONE EXAMPLE IS THE LEAF COALITION⁽¹⁷⁾, WHICH PROVIDES PAYMENT FOR REDD+ AT THE NATIONAL AND SUBNATIONAL LEVELS.

According to Lowering Emissions by Accelerating Forest Finance (LEAF), drastically reducing deforestation in the Brazilian Amazon by 2030 could generate up to USD 18.2 billion (through carbon markets at a minimum price of USD 10 per ton of CO₂). If prices rise to USD 15 per ton of CO₂, this value could reach USD 26 billion (Figure 9).

(13) <https://amazonia2030.org.br/indice-de-progresso-social-na-amazonia-brasileira-ips-amazonia-2021/>

(14) Projeto Mapbiomas. <https://mapbiomas.org/>

(15) <https://amazonia2030.org.br/o-paradoxo-amazonico/>

(16) <https://amazonia2030.org.br/identificando-areas-prioritarias-para-restauracao-bioma-amazonia/>

(17) <https://amazonia2030.org.br/oportunidades-financeiras-para-brasil-com-a-reducao-dodesmatamento-na-amazonia/>

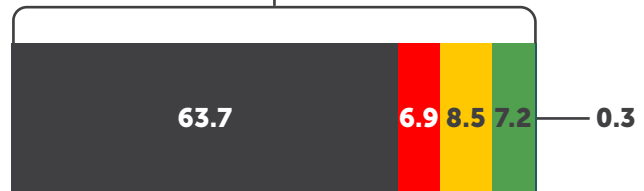
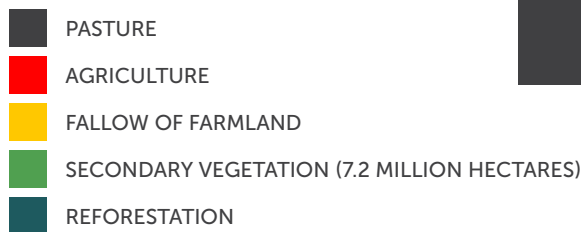
FIGURE 7 • INCREASE AGRICULTURE AND LIVESTOCK PRODUCTIVITY

The Brazilian Amazon can triple agricultural productivity, free up millions of hectares for forest restoration, and comply with international agreements with a more effective use of this area alone (in millions of hectares)

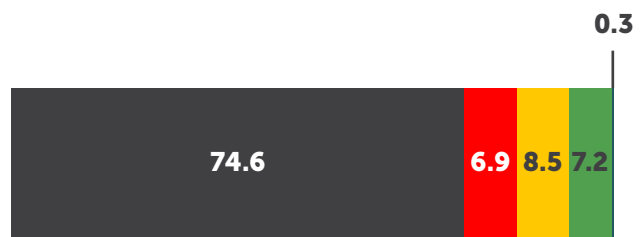
- 1 Around 21% of the Amazon has already been deforested, equivalent to 86 million hectares*



- 2 Today this open area is used as follows:



- 3 At the current pace, to meet demand without increasing productivity, it will be necessary by 2030 to increase the deforested area



- 4 With an increase in livestock productivity, it will be possible to meet this projected demand by using less pasture area, leaving a total of 37 million hectares available for reforesting or other purposes



- 5 This area is so big that it would fit the combined areas of the entire world's plantations of...

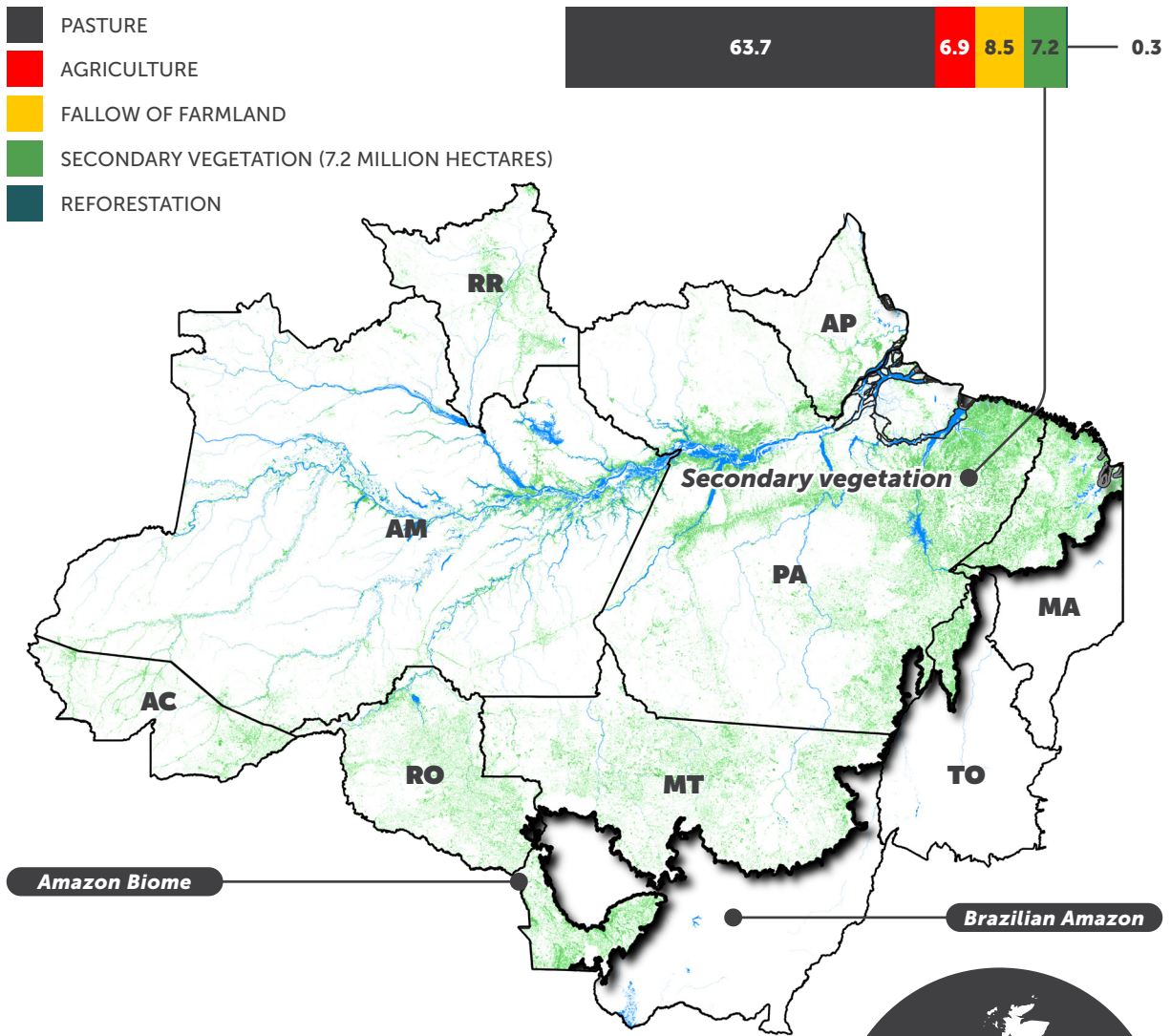


* According to INPE (2022), this area adds up to approximately 84 million hectares, while MapBiomas calculates it at 86 million hectares
Source: AMZ2030 based on data from Mapbiomas (2022) and Pinto *et al* (2021)

FIGURE 8 • PROMOTING FOREST RESTORATION IN THE BRAZILIAN AMAZON

Forest restoration generates wealth and helps fight climate change (in millions of hectares)

- 1** Of the entire area deforested today, about 7.2 million hectares are covered by secondary vegetation that is more than 6 years old



- 2** This area is distributed throughout the Brazilian Amazon and can generate carbon credits for rural landowners
- 3** The total area of secondary vegetation is equivalent to the size of Ireland



Source: AMZ2030 based on data from Mapbiomas (2022) and Pinto *et al* (2021)



FIGURE 9 • PROMOTING THE REDD+ MARKET

There is a growing and robust market for payment for forest carbon (deforestation rate in millions of hectares)

1

FUND

The international LEAF coalition* pays to reduce the deforestation of tropical forests

2

REDUCTION

If Brazil reduces deforestation in the Amazon according to the pace projected in the graph, it will receive annual amounts through this fund

3

CARBON

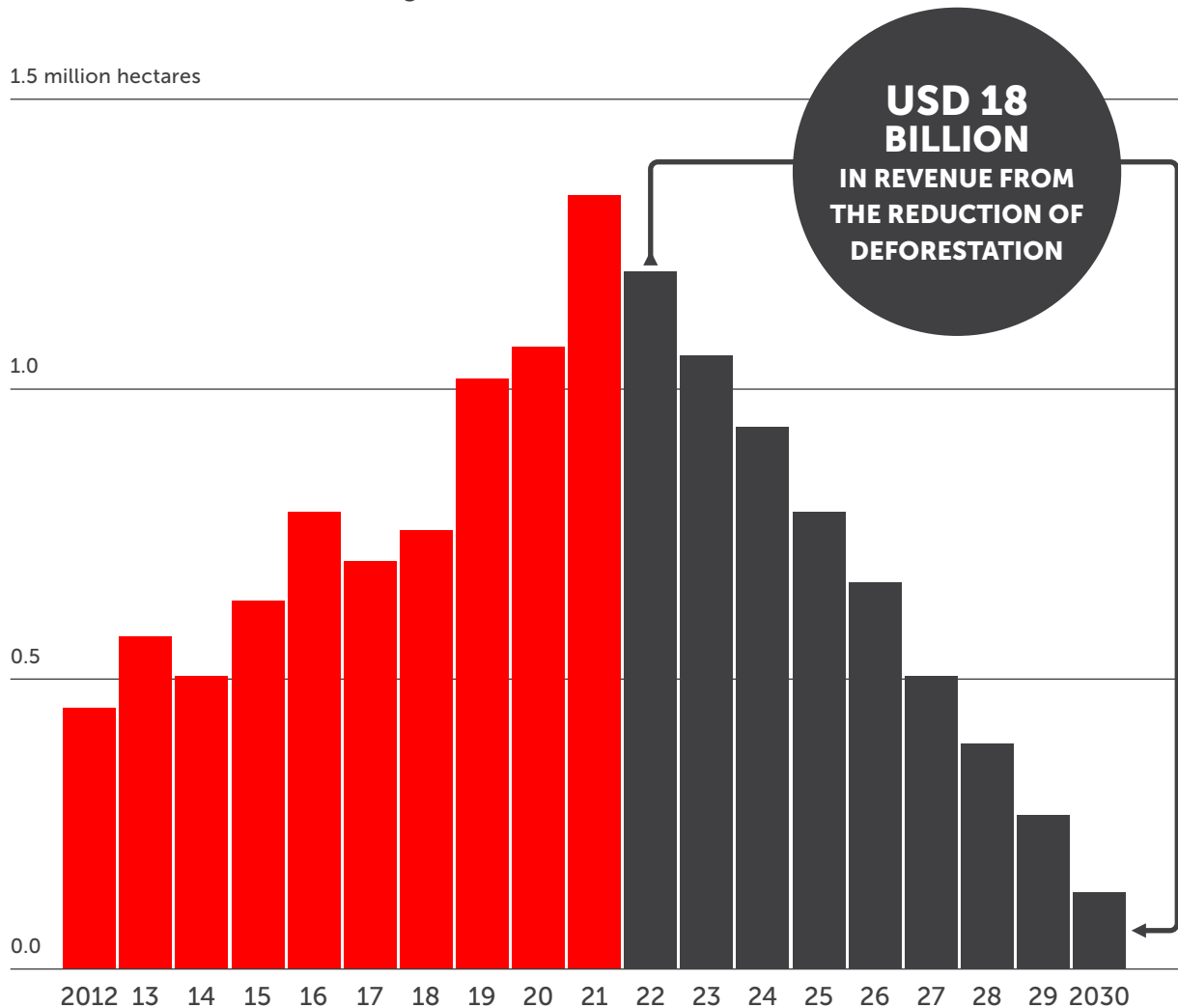
LEAF will pay a minimum price of USD 10 per ton of CO₂

4

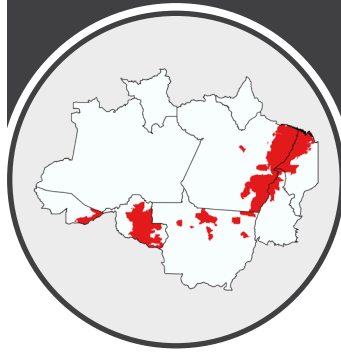
GAINS

Brazil could earn an estimated USD 18 billion by 2031

1.5 million hectares



* LEAF Coalition (Lowering Emissions by Accelerating Forest Finance)
Source: AMZ2030 based on data from Pietracci et al (2022) and INPE (2022)



RECOMMENDATIONS FOR THE DEFORESTED AMAZON

The country can meet the entire demand for agricultural products in the Brazilian Amazon by 2030 without cutting down a single tree

- Prioritize land tenure regularization
- Improve the quality of the road network
- Increase livestock productivity
- Promote the expansion of agroforestry systems
- Encourage low-carbon agriculture
- Encourage forest restoration
- Promote reforestation
- Promote REDD+ credits

NON-FORESTED AMAZON (SAVANNAS)

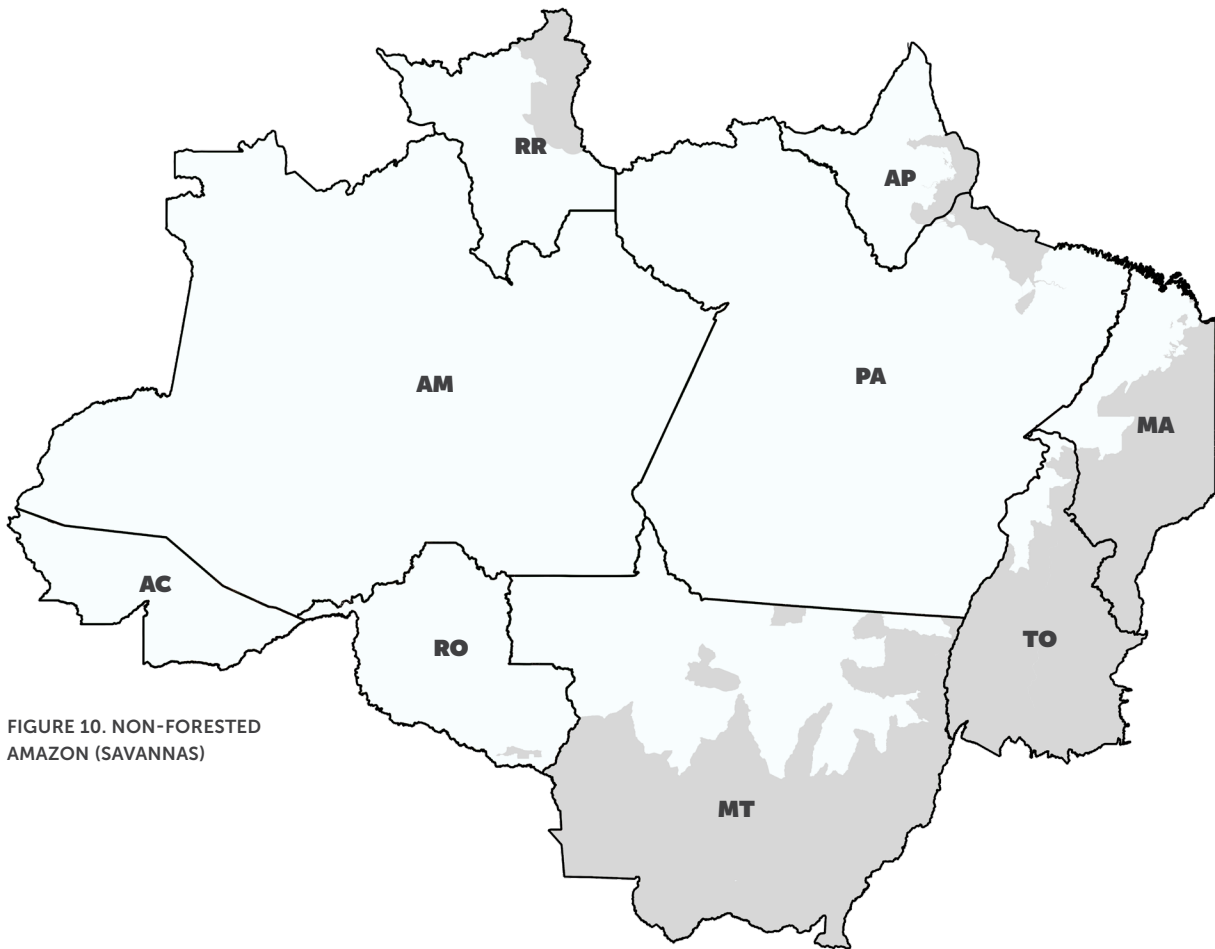


FIGURE 10. NON-FORESTED AMAZON (SAVANNAS)

THE **“NON-FORESTED AMAZON”** (FIGURE 10) CONSTITUTES 21% OF THE BRAZILIAN AMAZON AND IS COVERED MAINLY BY CERRADOS, A SAVANNA-TYPE VEGETATION⁽¹⁸⁾, WHILE THE FOREST COVER IS LESS THAN 50%. THE SAVANNAS ARE CONCENTRATED IN MATO GROSSO, TOCANTINS, AND RORAIMA. MOREOVER, THERE ARE EXTENSIVE CAMPINARANAS IN THE NORTH OF THE AMAZONAS STATE AND NATURAL FIELDS IN THE ISLAND OF MARAJÓ (PA).

This zone has a better road network, better infrastructure, and better internet access when compared to the rest of the Amazon. It is predominantly occupied by soy plantations. It shares the problems of and recommendations for the deforested Amazon. The implementation of the Brazilian Forest Code⁽¹⁹⁾ is essential to conserve biodiversity and protect water sources. In this zone, there are good economic opportunities for forest restoration, reforestation, agroforestry systems, and prospects for low-carbon agriculture.

(18) Also includes campinaranas and native grasslands

(19) <https://observatorioflorestal.org.br/en/o-codigo-florestal/>



RECOMMENDATIONS FOR THE NON-FORESTED AMAZON

There are great economic opportunities for forest restoration, reforestation, and agroforestry systems market, with good prospects for the development of low-carbon agriculture

- Fully adopt the Brazilian Forest Code
- Promote forest restoration
- Promote reforestation
- Combat the illegal conversion of the Cerrado/Savannas into farmland
- Fight wildfires and illegal burns
- Practice low-carbon agriculture
- Conserve biodiversity through the expansion of Protected Areas
- Regularize land ownership

THE URBAN AMAZON

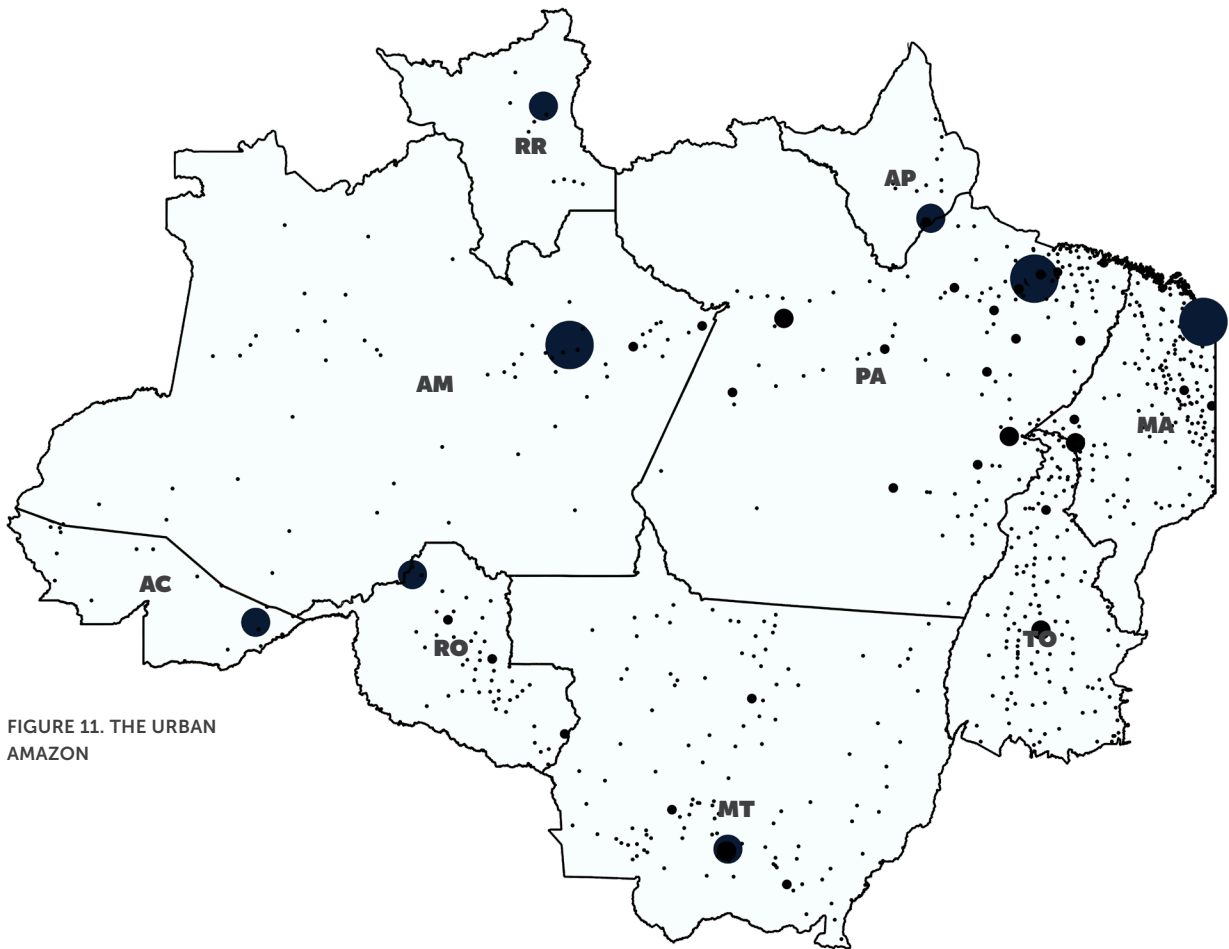


FIGURE 11. THE URBAN AMAZON

THE MAJORITY (76%) OF THE POPULATION IN THE BRAZILIAN AMAZON LIVES IN URBAN AREAS (FIGURES 11 AND 12)⁽²⁰⁾. HOWEVER, THE BRAZILIAN AMAZON CITIES HAVE POOR INFRASTRUCTURE AND POOR PUBLIC SERVICES COMPARED TO URBAN AREAS IN THE REST OF BRAZIL. THESE CITIES HAVE SEVERE SANITATION DEFICITS AND A THIRD OF URBAN HOUSEHOLDS DO NOT HAVE WASTE COLLECTION SERVICE⁽²¹⁾.

Despite the Brazilian Amazon's hot and humid tropical climate, urban afforestation occurs at lower rates than cities in the rest of the country⁽²²⁾. The majority (80%) of jobs are in cities. For this reason, it will be important to significantly expand the availability of vocational education, especially to youth and young adults in these urban areas.

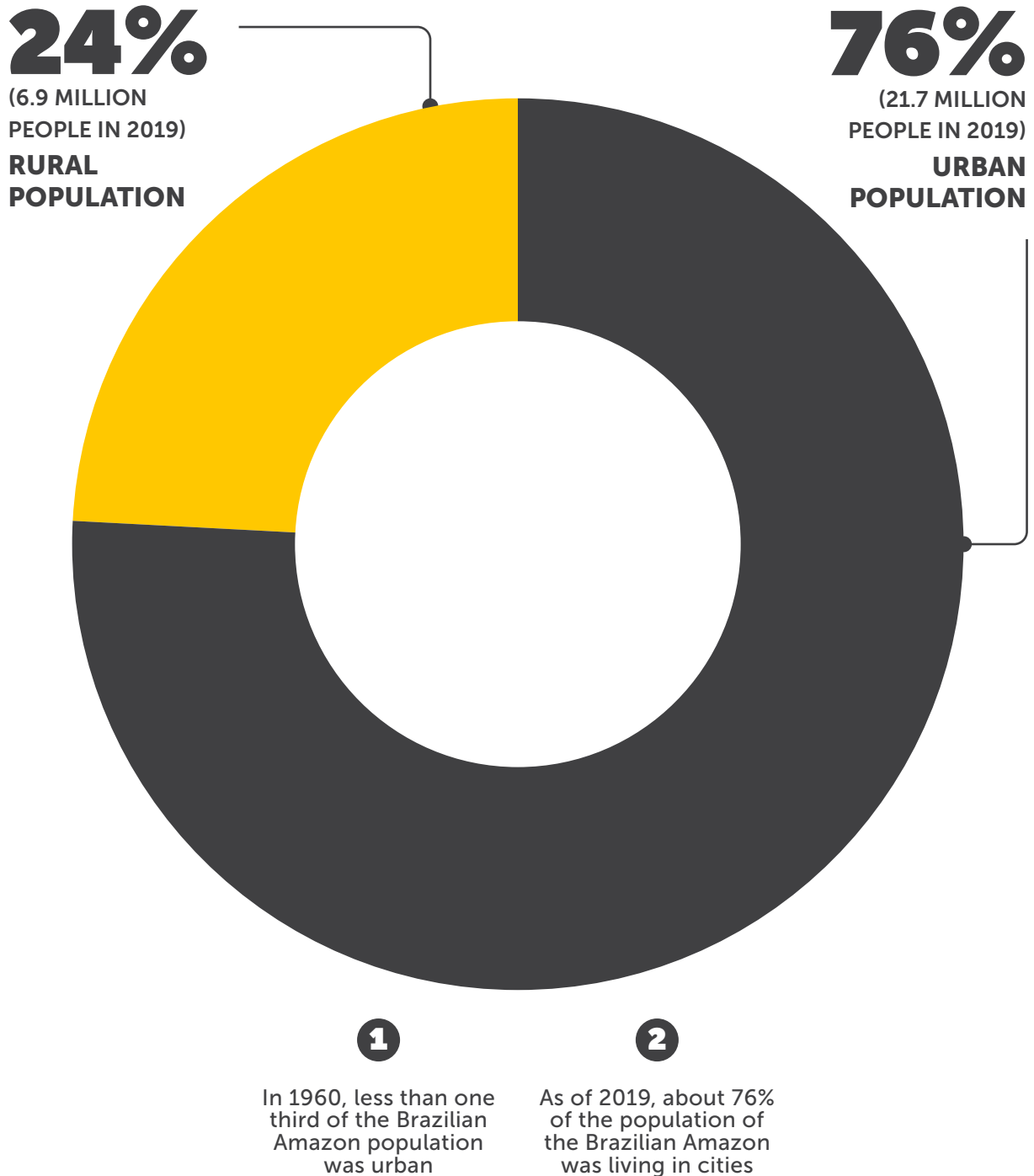
(20) <https://sidra.ibge.gov.br/pesquisa/pnadca/tabelas>

(21) <https://amazonia2030.org.br/o-paradoxo-amazonico/>

(22) <https://amazonia2030.org.br/as-cidades-na-amazonia-legal-diagnostico-desafios-e-oportunidades-para-urbanizacao-sustentavel/>

FIGURE 12 • THE MAJORITY OF THE POPULATION IN THE BRAZILIAN AMAZON IS URBAN

Most of the population of the region lives in cities

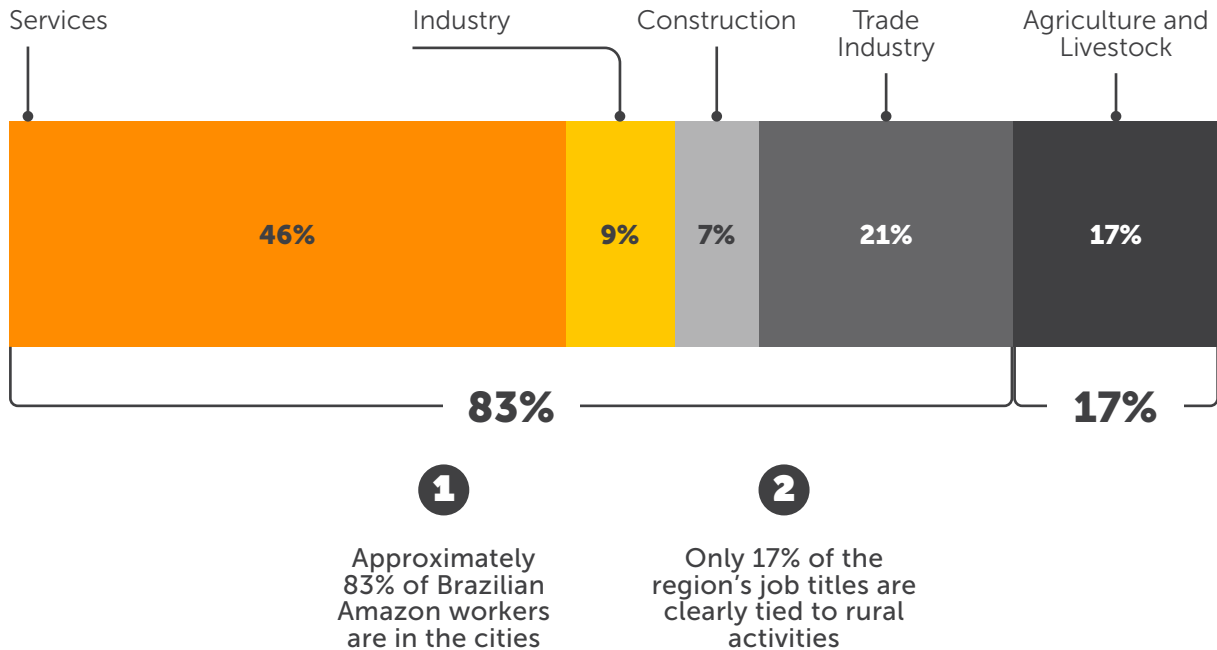


Source: AMZ2030, with data from the IBGE Demographic Census (2010) and the IBGE Continuous National Household Sample Survey (PNAD-C, 2022)

This training will allow youth and young adults to take advantage of emerging employment and entrepreneurship opportunities in the areas of software and information technology, creative economy such as film-making, design, cultural production, gastronomy, tourism, etc. (Figures 13 and 14).

FIGURE 13 • JOB DISTRIBUTION BY TYPE IN THE BRAZILIAN AMAZON

More than 80% of job opportunities are in the urban area



Source: AMZ 2020, with data from the IBGE Continuous National Household Sample Survey (PNAD-C, 2022)

BOX 7 • MANAUS FREE TRADE ZONE (ZFM)

THE ZFM HAS THE POTENTIAL TO PROVIDE A GREATER CONTRIBUTION TO THE GENERATION OF INCOME AND EMPLOYMENT. ALTHOUGH THE OBJECTIVE OF INDUSTRIAL POLICY IS REGIONAL DEVELOPMENT AND EMPLOYMENT GENERATION, THE MAJORITY OF ITS WORKERS ARE NOT WELL PAID. In 2019, the majority (59%) of employees at the Industrial Hub of Manaus ZFM earned less than twice the Brazilian minimum wage. In order to fulfill its role and contribute to the region, the ZFM should prioritize the training and hiring of local labor, reinvest in the improvement of urban infrastructure, and support entrepreneurship and innovation with an emphasis on the effective use of natural resources in the Brazilian Amazon⁽²³⁾.

(23) <https://amazonia2030.org.br/aprimorando-zona-franca-manaus/>

FIGURE 14 • INVESTING IN SMALL AND MEDIUM CITIES IN THE BRAZILIAN AMAZON

Most residents live in small towns and away from large centers

1

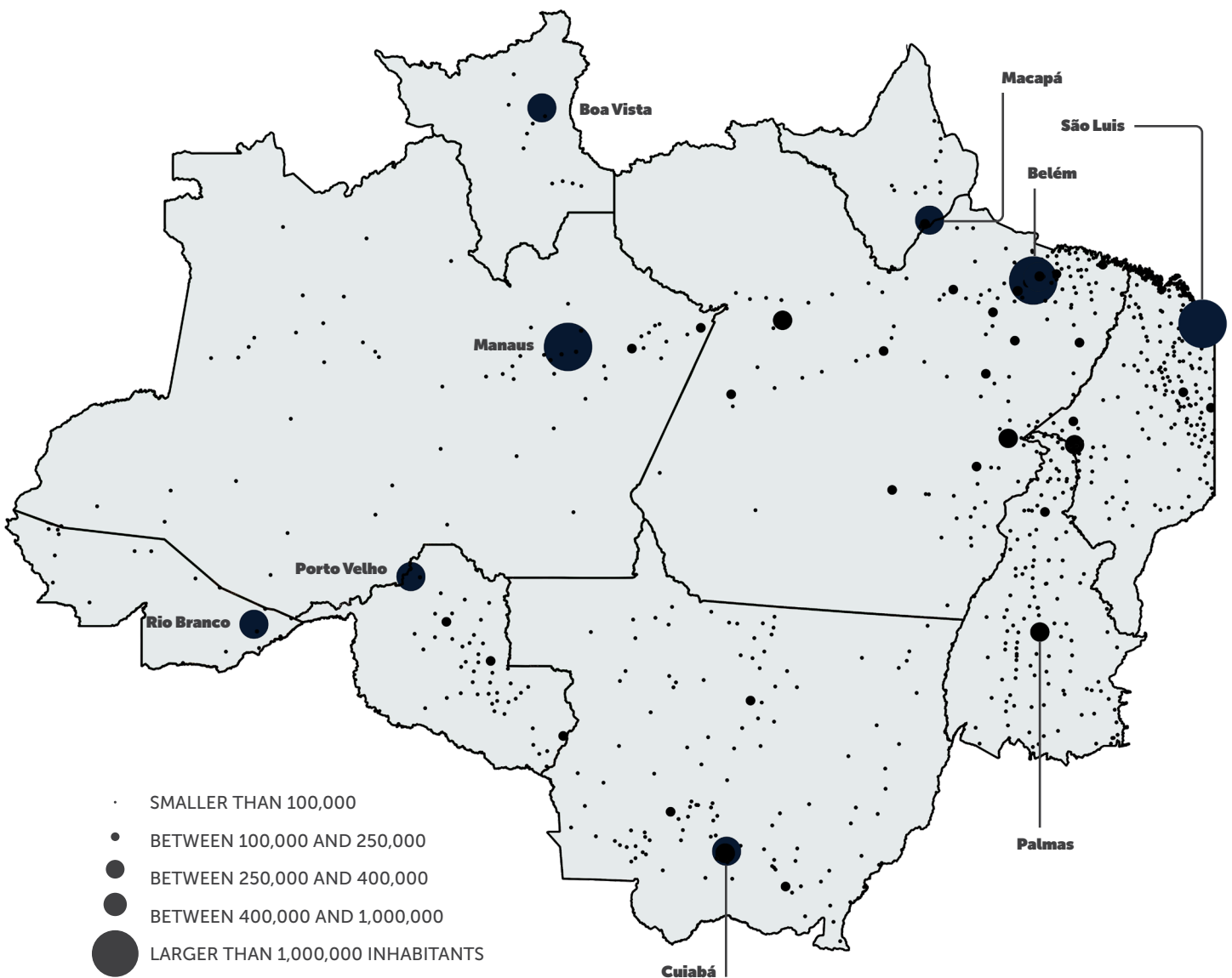
In the Brazilian Amazon, 58% of the population lives in small municipalities, but the percentage is 43% in the remainder of Brazil

2

The Brazilian Amazon lacks the kind of medium-sized cities that offer health care, education, justice, and other public services

3

Small municipalities are defined as having populations lower than 100,000 inhabitants (2021 data)

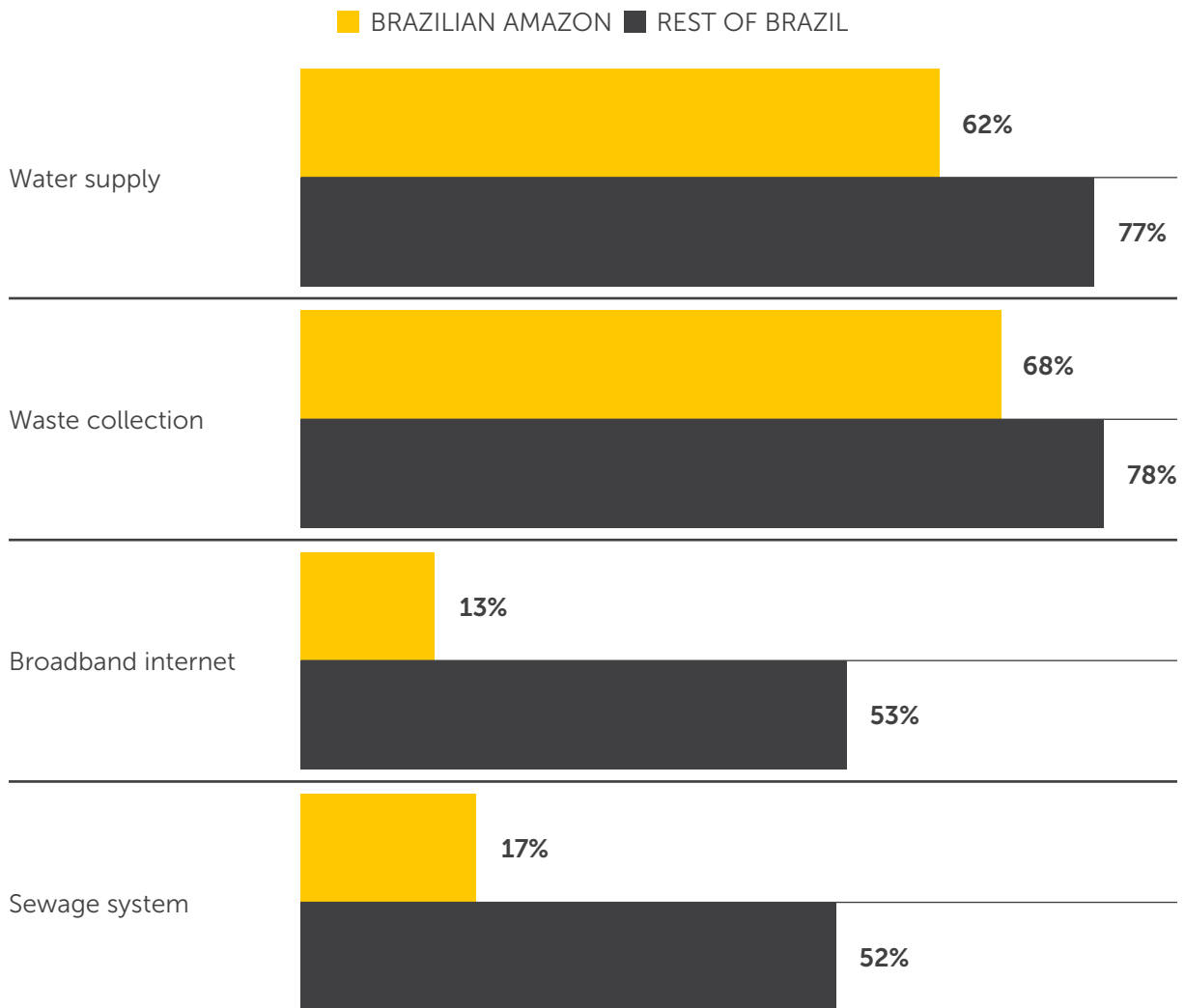


Source: AMZ 2030, with data from the IBGE Municipal Population Estimate (2021)

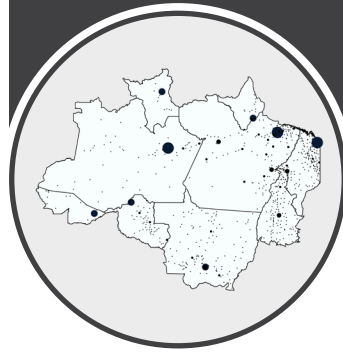
Finally, it is necessary to invest in expanding and improving internet access in small and medium-sized cities and on the outskirts of large cities. This infrastructure will be essential to opening up new employment and income opportunities for which young people must be trained. Quality internet access strengthens the connection network between Amazonian cities and promotes improvements in public services and in the urban economy (Figure 15)⁽²⁴⁾.

FIGURE 15 • THE INFRASTRUCTURE OF THE BRAZILIAN AMAZON

The Amazon’s urban infrastructure is also worse than the rest of the country’s. To improve the quality of life of the population and encourage people to remain in the region, it is necessary to invest in essential services



Source: AMZ2030 with data from the Ministry of Citizenship (2022), Anatel (2022), and IBGE (2022)
 (24) Cities with population size between 100,000 and 500,000 inhabitants



RECOMMENDATIONS FOR THE URBAN AMAZON

Since urban areas contain most of the population, it is important to invest in cities' infrastructure to improve people's quality of life

- Improve the quality of urban life
- Promote urban and river mobility
- Promote tree planting in cities
- Ensure access to basic sanitation, garbage collection, and water supply
- Promote areas of leisure and culture
- Expand broadband internet access
- Reinforce urban infrastructure
- Invest in professional training



CONCLUSION

Recognizing that there are different Amazons is essential for understanding and planning public policies for conservation and sustainable development in the region. The division of the Amazon into five zones is an initial contribution to this debate. Other analyses should certainly be contemplated. For example, it is possible to analyze these regional differences by comparing the 28 mesoregions that make up the Brazilian Amazon. As we have noted, there are distinct opportunities and challenges in each of the five Amazon zones.

In ***“The Forested Amazon”*** – where there are more forests and relatively few people – the recommendations include strengthening environmental services and the use of forest resources (bioeconomy), in addition to promoting the improvement of the population’s social conditions.

In ***“The Brazilian Amazon with Forest Under Pressure”*** – where deforestation rates are highest – it is essential to stop deforestation and forest degradation by implementing strong command and control efforts combined with sustainable economic alternatives.

In ***“The Deforested Amazon”*** – largely occupied by low-productivity livestock – there is enormous potential for increasing agricultural productivity and for forest restoration.

The same potential exists in, ***“The Non-Forested Amazon”***, where Savannas vegetation predominates.

And, in ***“The Urban Amazon”*** – which contains 76% of the population – it is necessary to improve the infrastructure related to sanitation, housing, mobility, urban afforestation, broadband internet, among others.

Finally, more robust investments are needed to sustainably develop the Amazon. The region’s per capita budget is not enough to reduce the region’s disparity with the rest of Brazil in terms of health care, education, and infrastructure.

The Amazon presents serious difficulties for development given its considerable size, its distinct demography (a predominance of young people, resulting in a demographic dividend until 2030), and its socioenvironmental challenges. To compensate for these barriers, it will be necessary to ensure tax fairness, i.e., more funding to address the greatest difficulties in the region.



NOTES METHODOLOGY

To separate the Brazilian Amazon into five zones, the authors first classified each municipality as forested or non-forested. Municipalities with original forest cover greater than 50% according to the map of vegetation physiognomies (IBGE 1997) were classified as “forested”. In turn, municipalities with less than 50% forest were classified as “non-forested” and constitute Zone 4, “Non-Forested Brazilian Amazon” .

Next, forested municipalities were divided into three groups according to deforestation pressure: deforested, under pressure, and forested. These groupings were created through a statistical *K-means cluster analysis*, which creates groups as statistically distinct as possible through a set of response variables (Hardigan 1975; Härdle & Simar 2015). Deforestation in the Brazilian Amazon is mapped annually by the INPE through the analysis of *Landsat* satellite images. We used the INPE’s deforestation map and the map of municipal boundaries from the IBGE in this analysis.

Data on the total, urban, rural, and migrant population and population composition are collected by the IBGE through demographic censuses, surveys of household samples and published on the internet, on the IBGE, Institute for Applied Economic Research (*Instituto de Pesquisa Econômica Aplicada – Ipea*), or United Nations Development Programme (UNDP) websites.

A NOTE OF CAUTION

For the analyses and definition of zones, we adopted the municipal scale. However, there are 29 municipalities in the Brazilian Amazon whose territorial extension is equal to or greater than 30,000 square kilometers (an area greater than Belgium). A few municipalities cover areas even greater than 100,000 square kilometers. For example, Altamira, in the Eastern Amazon, encompasses 159.5 thousand square kilometers and thus it is larger than Austria, Switzerland and Belgium combined.

For large municipalities with territories of this magnitude, municipal data cannot fully capture the internal differences in the dynamics of human occupation and the pattern of deforestation. In order to have a more accurate picture of the spatial patterns of frontier occupation and deforestation, the solution would be to use census data (the IBGE collection and unit of analysis). Unfortunately, due to the unavailability and time lag of these data, we were unable to adopt this approach.



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KEY WORDS

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ABOUT THE AMAZON 2030

The AMAZÔNIA 2030 project is an initiative led by Brazilian researchers to develop a sustainable development plan for the Brazilian Amazon. Our objective is to provide conditions for the region to reach a higher level of economic and human development and achieve the sustainable use of natural resources in 2030

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