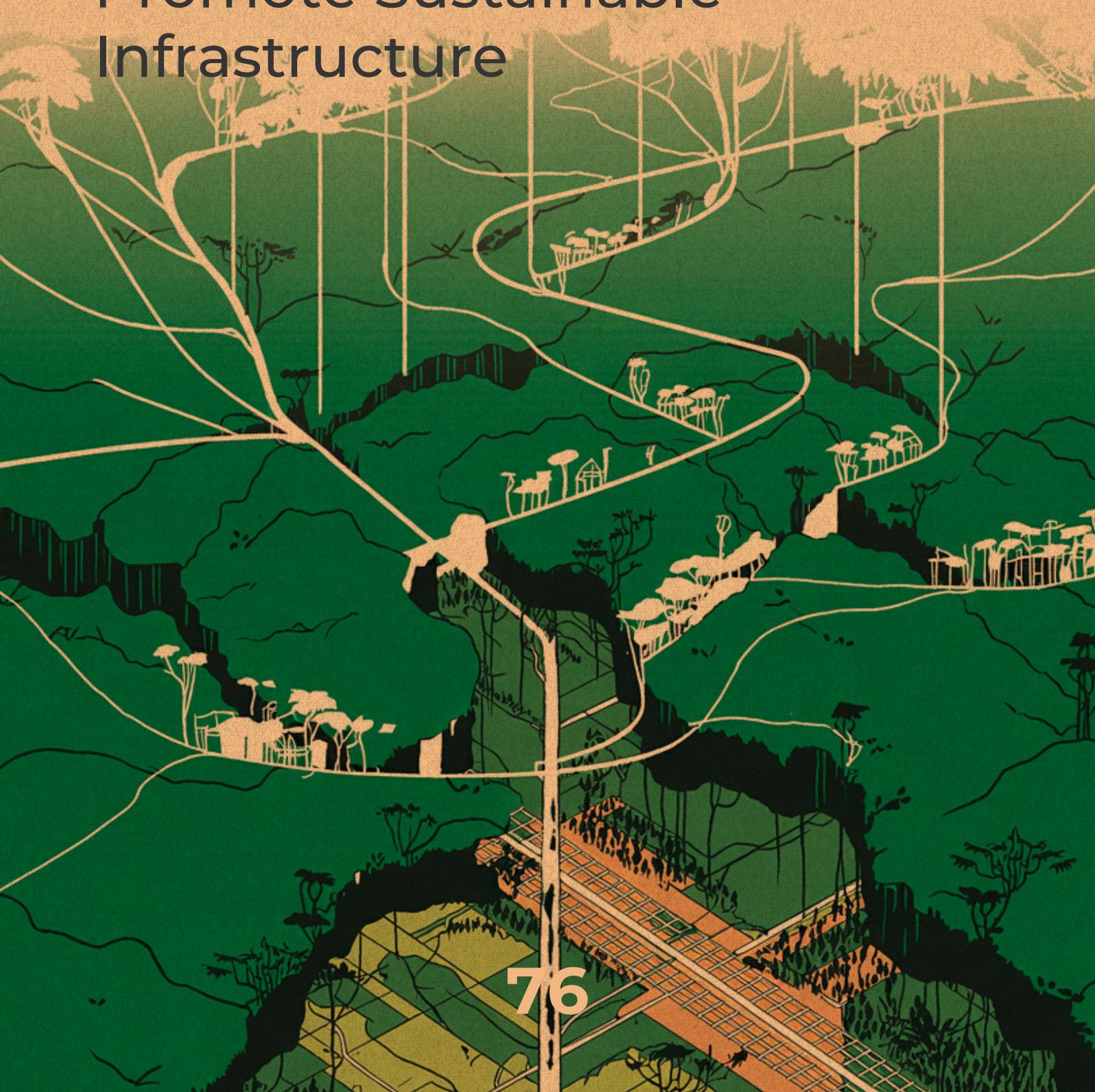


The Amazon in the New PAC: Recommendations to Promote Sustainable Infrastructure



Introduction

With the aim of tackling Brazil's main infrastructure bottlenecks while also accelerating economic growth, in August 2023 the Federal Government launched the third edition of the Growth Acceleration Program (*Programa de Aceleração do Crescimento* - PAC), better known as the New PAC.^{1,2} This program is subordinated to the guidelines of the Ecological Transformation Plan (*Plano de Transformação Ecológica* - PTE)³ which aims to promote an inclusive and sustainable development model and assigns infrastructure a catalytic role in this transformation.

The official discourse on the New PAC has highlighted its commitment to decarbonization, social inclusion, and green growth. However, for this commitment to materialize, the program needs to reflect a development model that generates benefits for the Amazon, with special attention to projects that could result in high socio-environmental impacts in the region.

The Amazon is the main frontier for major infrastructure investment projects in Brazil over the next few years. Among the initiatives planned is a series of logistics integration projects between land and water transportation, which aims to integrate grain and mineral production in the North and Midwest regions with the ports of the Amazon basin.

The installation of infrastructure services to provide local water, sanitation, health, mobility and energy has immense potential to attract capital to the region's economy and generate benefits for its population. Local demand for infrastructure is enormous in Brazil's Amazon region, which has some of the worst social indicators in the country.^{4,5} Improving infrastructure could not only boost the local economy and reduce regional disparities, but also strengthen sustainable production chains, such as the bioeconomy, and promote more

1 Casa Civil. *Conheça o Novo PAC*. nd. Access date: February 27, 2025. bit.ly/3Xhp5tK.

2 Decree no. 11,632, August 11, 2023 - bit.ly/3XmwAzw.

3 Ministério da Fazenda. *Conheça o Plano de Transformação Ecológica*. nd. Access date: February 27, 2025. bit.ly/41z0Eug.

4 Wilm, Melissa et al. *Índice de Progresso Social Brasil 2024 – Resumo Executivo*. Imazon, Amazon 2030, Fundación Avina, Anattá Pesquisa e Desenvolvimento e Social Progress Imperative, 2024. bit.ly/3EUQ1cl.

5 Santos, Daniel et al. *Índice de Progresso Social na Amazônia Brasileira: IPS Amazônia 2021 – Resumo Executivo*. Belém: Imazon e Amazon 2030, 2021. bit.ly/4hX7yi3.

efficient use of land, by reducing transportation costs for inputs and products, access to technical assistance and energy for eventual processing.

In order to produce the desired results, it is essential that the implementation of infrastructure in the Amazon takes into account the heterogeneity and complexity of the region, promoting development based on the social, economic, and environmental peculiarities of each territory.⁶ However, the experience of recent decades suggests that infrastructure investments in the Amazon have been designed to meet the demands of other regions of the country. As a result, related projects face implementation challenges, generate considerable socio-environmental damage, fail to meet local demands, and do not increase the population's quality of life.

This is largely the result of the lack of medium- and long-term planning in Brazil, especially for logistics infrastructure, which ensures greater efficiency and integrity for projects. This lack of planning is aggravated by a lack of vision for the Amazon and how to use its natural resources in Brazil's Federal Development Strategy (*Estratégia Federal de Desenvolvimento para o Brasil - EFD*),⁷ a medium-term planning instrument covering 2020 to 2031.⁸ Other planning instruments, such as sectoral plans, also make no explicit mention of the Amazon, and do not specify the socio-environmental criteria adopted for the inclusion of projects.

Without a planning strategy indicating the desired development model for the Amazon, it is not possible to establish what demands for infrastructure services are to be met in the short, medium, and long term, or identify the related investment priorities. It is also not possible to exclude projects that are incompatible with the intended development strategy.

6 Veríssimo, Beto et al. *The Five Amazons: Basis for the Sustainable Development of the Brazilian Amazon*. Amazon 2030, 2022. bit.ly/3Yg1xpC.

7 Decree no. 10,531, October 26, 2020. Access date: April 14, 2025. bit.ly/3RNN3JR.

8 Chiavari, Joana et al. *Ciclo de vida de projetos de infraestrutura: do planejamento à viabilidade. Criação de nova fase pode elevar a qualidade dos projetos*. Rio de Janeiro: Climate Policy Initiative, 2020. bit.ly/42MTXFu.

In this context, researchers from the Climate Policy Initiative/Pontifical Catholic University of Rio de Janeiro (CPI/PUC-RIO) and Amazon 2030 analyzed how the New PAC relates to the Amazon, based on the investments planned in the program for four crucial sectors for regional development: logistics, connectivity, sanitation and energy.

The analysis shows that:

- **Despite promoting investments in all Amazon states, the distribution of the projects among the states under the New PAC portfolio does not necessarily correspond with the lack of infrastructure in each territory.** For example, Acre is one of the least connected states, but it is the last state to be served by the program. In the sanitation sector, Amapá has, among the main states of the Amazon biome,⁹ the lowest percentage of households with access to water and sewage networks; despite this, it is only due to receive one intervention under the New PAC, in the capital Macapá. This lack of clear selection and prioritization criteria for projects indicates a disconnect between the New PAC and states' needs that could prevent the program from achieving its objectives, and fail to contribute to reducing the disparities present in the region.
- **The New PAC does not take into account the complexity and heterogeneity of the region and the fact that there are different Amazons.** Each zone has its own particularities based on its vegetation cover, landscape, and socio-economic activity, necessitating specific strategies and projects to suit the needs of each one.¹⁰ However, the New PAC lacks a better adaptation to the demands and aptitudes of the Amazon macro-regions, because instead of prioritizing the expansion of land infrastructure in urban or already deforested regions, it includes projects, such as the construction of Ferrogrão and the paving of BR-319 highway, which affect the Forest Amazon and encompass municipalities with only 5% deforested forest cover, without observing whether they represent the most appropriate modal for that particular macro-region.

⁹ These states are: Acre, Amapá, Amazonas, Pará, Rondônia and Roraima, which are entirely within the biome.

¹⁰ Veríssimo, Beto et al. *The Five Amazons: basis for the sustainable development of the Brazilian Amazon*. Amazon 2030, 2022. bit.ly/3Yg1xpG.

- **The New PAC needs to seek greater alignment with other public policies in force in the Amazon.** In particular, it is not clear how the New PAC relates to the national targets for reducing deforestation in the Amazon. One of the objectives of the Action Plan for the Prevention and Control of Deforestation in the Legal Amazon (*Plano de Ação para Prevenção e Controle do Desmatamento na Amazônia Legal - PPCDAM*) is to align infrastructure planning with its goal of zero deforestation by 2030. However, measures to improve planning and decision-making processes and methodologies to better assess the impacts of projects on deforestation targets, as provided for in the plan, are not considered in the New PAC.¹¹

Given the results of the analysis, CPI/PUC-RIO and Amazon 2030 propose general recommendations, as well as specific guidelines for the main investment sectors analyzed, which can help align the New PAC with a sustainable development agenda for the region. The recommendations presented are based on empirical studies by the Amazon 2030 initiative and CPI/PUC-RIO.¹²

The New PAC

Growth Acceleration Programs (PACs) aim to encourage socio-economic development through infrastructure projects. For the first time, the New PAC is linked to a sustainable development plan—the Ecological Transformation Plan—and is a joint action of the Ministry of Finance (*Ministério da Fazenda - MF*) and the Ministry of Environment and Climate Change (*Ministério do Meio Ambiente e Mudança do Clima - MMA*).¹³ Investments in the energy transition, increasing the resilience of cities to climate change, and regulatory and institutional measures aligned with climate policy are all part of the program.

One of the main characteristics of the New PAC is the importance of partnerships in investments: around R\$ 612 billion of the R\$ 1.7 trillion planned by the government is expected to come from the private sector. This represents the

11 Objective 11 of Axis III of the Plan. Learn more at: MMA. *Action Plan for the Prevention and Control of Deforestation in the Legal Amazon (PPCDAm) - Fifth Phase (2023-2027)*. 2023. Access date: April 15, 2025. bit.ly/4jzwoX2.

12 Climate Policy Initiative. *Sustainable Infrastructure Portfolio*. 2020. bit.ly/4ieuw4k.

13 Viana, Arthur B. R. and João H. S. Nascimento. "Desigualdade e Sustentabilidade: Novo PAC". *Revista Pet Economia Ufes* 4 (2024): 25-26. bit.ly/4bBoFVf.

consolidation of a new profile of financing and partnerships between the public and private sectors in infrastructure works that has been established over the last decade, as a result of the fall in the share of public financing and the increase in the role of private sector in financing and executing projects.¹⁴

Another important feature is that almost half of the actions planned under the program are the resumption of paralyzed or unfinished works.¹⁵ In fact, one of the main criticisms of previous PACs is that they failed to complete a large portion of their projects.

However, there are questions about the capacity to carry out the investments planned in the New PAC. There are fears that the economy's high interest rates could make private investment unfeasible to the extent expected, and that there will be a shortage of manpower to carry out the work.

14 Inesc. *Perfil de Financiamento da Infraestrutura Logística no Brasil*. Brasília, 2024. bit.ly/4ij5xNc.

15 Monteiro, Solange. "Novo PAC e os desafios do governo para impulsionar o crescimento". *Conjuntura Econômica* (2023): 22-32. bit.ly/3DddPrA.

There are also doubts about the New PAC's ability to take into account different regional needs, something that compromised previous PACs' ability to overcome existing imbalances and inequalities.¹⁶ There is also criticism that the planned investments, even if fully realized, may not be enough to pull the country out of its backlog in sectors such as logistics infrastructure.¹⁷

While on the one hand the New PAC represents progress, channeling resources to climate transition and sustainability projects, on the other hand the program has contradictions, such as when it envisages significant investments in fossil-based energy, including oil and gas projects and, more specifically, the replacement of diesel-fired thermoelectric plants with natural gas plants in the Amazon, which also emit greenhouse gases (GHGs).

Another contradiction in the New PAC with regard to the sustainability of investments is its misalignment with the PPCDAM, which adopts the goal of achieving zero deforestation by 2030, understood as synonymous with not reducing the area of native vegetation in the Amazon biome. To achieve this goal, one of the PPCDAM's expected results is that the planning and decision-making processes for the implementation of major infrastructure projects will be improved and adapted to the country's environmental and development goals.¹⁸ However, the New PAC does not provide concrete measures to achieve this, nor does it make any reference to the measures provided for in the PPCDAM, including the development and use of technical, economic and environmental feasibility studies (*Estudos de Viabilidade Técnica, Econômica e Ambiental - EVTEA*) for the decision-making process and the definition of a methodology for assessing the potential direct and indirect impacts of infrastructure projects on the goals of zero deforestation by 2030.

16 Nunes, Maria. O Programa de Aceleração do Crescimento e as Fronteiras". In: Pêgo, Bolívar e Rosa Moura (org.). *Fronteiras do Brasil: uma avaliação de política pública*. Vol. 1. Rio de Janeiro: Ipea, 2018, 381-411. bit.ly/42CAhmH.

17 Quintella, Marcus. *O Novo PAC e a infraestrutura de transportes*. Folha de S. Paulo. 2023. Access date: February 27, 2025. bit.ly/43e0J7U.

18 Objective 11 of Axis III of the Plan. Learn more at: MMA. *Action Plan for the Prevention and Control of Deforestation in the Legal Amazon (PPCDAm) - Fifth Phase (2023-2027)*. 2023. Access date: April 15, 2025. bit.ly/4jzwoX2.

These contradictions are aggravated by the lack of transparency regarding the decision-making process for including projects with high socio-environmental impacts in the program.

In addition, with regard to the lack of transparency in the New PAC, the information available on the program is out of date. For example, the construction of the BR-319 highway, included in the New PAC in October 2024,^{19,20} does not appear on the list of projects on the official website.²¹ There is also a lack of information regarding the New PAC projects in the following aspects: criteria used to include them in the program, feasibility of the projects, compliance with environmental licensing, consultations with affected populations and monitoring of project execution.²² This lack of transparency makes it difficult to monitor the execution of projects and compromises actions of control bodies and civil society. Finally, there is a lack of transparency in the New PAC regarding the criteria for defining which projects should be prioritized.²³

19 CGPAC Resolution no. 7, October 3, 2024. bit.ly/4it5yPm.

20 Casa Civil. *Novo Pac - Legislação*. nd. Access date: March 6, 2025. bit.ly/3F3Fdce.

21 Casa Civil. *Novo PAC - Transporte Eficiente e Sustentável - Rodovias*. nd. Access date: March 6, 2025. bit.ly/3XUaCDz.

22 Transparência Internacional – Brasil and CoST – Infrastructure Transparency Initiative. *Governança, Transparência e Participação Social no Novo PAC: Desafios e Oportunidades*. 2024. bit.ly/4bhIkKL.

23 Frischtak, Claudio, Francisco Caputo and Vinícius Bastos. *Novo Programa de Aceleração do Crescimento e Principais Desafios*. CBIC, 2023. bit.ly/3D8akCO.

What Does the New PAC Propose for the Amazon?

Logistics

The Legal Amazon is the most economically isolated region in Brazil.²⁴ The typical municipality in the Amazon has a potential market 2.1 times smaller than the typical municipality in the rest of the country.²⁵ This isolation results from a limited and precarious network of roads, railroads, and waterways in the region.²⁶ It also stems from major logistics projects that have brought high socio-environmental costs without generating significant benefits for local populations. Until 2006, for example, approximately 95% of deforestation in the Amazon occurred within 5.5 km of roads.^{27,28} In addition, large projects have increased agricultural production in a few concentrated areas, often outside the Amazon,²⁹ without taking into account the low productivity of the sector in the biome, where 10 hectares of pasture, capable of feeding 33 animals, typically feed only 10—an inefficiency that encourages the expansion of pastures at the expense of the forest.³⁰

The New PAC provides for the implementation of waterway, port, highway and railroad projects in the Amazon. Of the 62 actions planned at national level for waterways, 36 actions cover the main states in the Amazon biome,³¹ with studies and works for state and interstate waterways, highlighting actions to build or improve the so-called Small Public Port Facilities (*Instalações Portuárias Públi-*

24 The Legal Amazon is made up of the states of Acre, Amapá, Amazonas, Mato Grosso, Pará, Rondônia, Roraima, Tocantins and part of Maranhão. Learn more at: IBGE. *Legal Amazon*. 2022. bit.ly/4iBIMWa.

25 Araújo, Rafael, Arthur Bragança, and Juliano Assunção. *Accessibility in the Legal Amazon: Delimiting the Area of Influence and Environmental Risks*. Amazon 2030, 2022. bit.ly/3Yg0FB0.

26 According to the Brazilian's National Logistics Plan, the Amazon and Pantanal biomes have the smallest transportation networks in Brazil, compared to the other biomes. Learn more at: MINFRA and EPL. *NLP 2035 - Brazilian's National Logistics Plan*. 2021. bit.ly/4cLtCes.

27 Ahmed, S. E. et al. "Temporal patterns of road network development in the Brazilian Amazon". *Regional Environmental Change* 13 (2013): 927-937. bit.ly/3zRd5Eo.

28 Barber, Christopher P. et al. "Roads, deforestation, and the mitigating effect of protected areas in the Amazon". *Biological Conservation* 177 (2014): 203-209. bit.ly/3OeOLRo.

29 Araújo, Rafael, Arthur Bragança, and Juliano Assunção. *Accessibility in the Legal Amazon: Delimiting the Area of Influence and Environmental Risks*. Amazon 2030, 2022. bit.ly/AMZInfluenceRisks.

30 Barreto, Paulo. *Políticas para desenvolver a pecuária na Amazônia sem desmatamento*. Amazon 2030, 2021. bit.ly/3MyWLxL.

31 Acre, Amapá, Amazonas, Pará, Rondônia and Roraima, which are entirely within the biome.

cas de Pequeno Porte - IP4) in the state of Amazonas. There are also efforts to build locks and to signalize, dredge and break up waterways.³²

With regard to the port sector, which is dealt with by the New PAC separately from waterways, of the 152 planned actions, 28 are aimed at the main states in the biome and include studies, works and port concessions to the private sector, with emphasis on port leasing actions in the state of Pará.³³ There are also dredging actions, the implementation of IT systems and the construction and improvement of port accesses, terminals and quays.³⁴

However, the main socio-environmental problems in the logistics sector in the Amazon come from land transportation, as indicated above. In the highways sector, the New PAC provides for 74 actions for the main Amazon biome states, mainly related to works on existing federal highways, especially in the state of Pará. The program also provides for ten highway concessions in the region.³⁵

In the rail sector, Pará is the only state covered by the New PAC among the main biome states, with three railroad concessions planned for the private sector and a study for an additional new concession.³⁶

In these four sectors, the New PAC provides for various actions to improve the so-called Northern Arc, which is a major logistics system for transporting national production in the Amazon region.³⁷ Components of the Northern Arc covered by the New PAC in the main states of the biome include improvements to systems and terminals and leases at the Port of Vila do Conde, in Pará, dredging, signaling and studies for the Madeira River waterway, between the states of Amazonas and Rondônia, the concessions and works on the BR-163/MT/PA, BR-155/158/MT/PA, and BR-364/RO highways and the concessions for the Ferrogrão railroad between Mato Grosso and Pará, the Norte-Sul railroad between Açailândia/MA and Barcarena/PA, and the Carajás railroad in Pará.

32 Casa Civil. *NovoPAC - Transporte Eficiente e Sustentável - Hidrovias*. nd. Access date: April 9, 2025. bit.ly/42siKgL.

33 Port leasing actions are a form of port privatization.

34 Casa Civil. *NovoPAC - Transporte Eficiente e Sustentável - Portos*. nd. Access date: April 9, 2025. bit.ly/43ZSj4J.

35 Casa Civil. *Novo PAC - Transporte Eficiente e Sustentável - Rodovias*. nd. Access date: March 6, 2025. bit.ly/3XUaCDz.

36 Casa Civil. *NovoPAC - Transporte Eficiente e Sustentável - Ferrovias*. nd. Access date: April 9, 2025. bit.ly/4jxSGaY.

37 Câmara dos Deputados, Centro de Estudos e Debates Estratégicos, Consultoria Legislativa. *Arco Norte: um desafio logístico*. Brasília: Câmara dos Deputados, Edições Câmara, 2016, p. 15. bit.ly/3Y2ARZn.

However, the New PAC does not explain why each project would be the best alternative to local needs, nor does it specify the measures to mitigate any negative effects.³⁸ For example, the Ferrogrão railroad is intended as an alternative to the BR-163 highway for transporting grain. The planned route crosses the Jamanxim National Park in Pará and could cause the deforestation of more than 2,000 km² of native Amazon forest in almost 40 municipalities in northern Mato Grosso.^{39,40,41} Another example is the construction of the BR-319 highway, which has the potential to encourage deforestation in 49 indigenous territories, 49 conservation units, and more than 140,000 km² of public forests in the highway's area of influence.⁴²

Connectivity

In view of technological progress and changes in the organization of work, the expansion of Internet services is a condition for the integration of the Amazon into national and international markets for work, goods, and services, as well as for the qualification of the region's inhabitants to operate in these markets. Only a quarter of rural residents in the Legal Amazon have access to 3G or 4G mobile Internet. This figure is 10% lower than in the rest of the country. In the case of broadband Internet, access is available to just 55% of urban dwellers and 45% of rural dwellers. These figures are, respectively, 20% and 18% lower than in the rest of the country.⁴³

On the subject of connectivity, the New PAC has the opportunity to resume the objectives of the former National Broadband Plan (*Programa Nacional de Banda Larga - PNBL*),⁴⁴ which was extinguished without significant results.

38 Casa Civil. *NovoPAC - Transporte Eficiente e Sustentável - Rodovias*. nd. Access date: March 6, 2025. bit.ly/3XUaCDz.

39 The reduction of the park's area due to the route of the railroad is being analyzed by the Federal Supreme Court (*Supremo Tribunal Federal - STF*). Learn more at: STF. *ADI no6553*. nd. Access date: March 13, 2025. bit.ly/4kD47Og.

40 Araújo, Rafael, Juliano Assunção, and Arthur Bragança. *The environmental impacts of Ferrogrão: An ex-ante assessment of deforestation risks*. Rio de Janeiro: Climate Policy Initiative, 2020. bit.ly/4lMGXXX.

41 Ferrogrão should also be part of the National Railroad Plan. Learn more at: Queiroz, Vitória. *Governo atrasa anúncio do Plano Nacional de Ferrovias*. CNN. 2025. Access date: March 17, 2025. bit.ly/3DMMtsA.

42 Araújo, Rafael, Arthur Bragança, and Juliano Assunção. *Accessibility in the Legal Amazon: Delimitation of the Area of Influence and Environmental Risks*. Amazon 2030, 2022. bit.ly/AMZInfluenceRisks.

43 Araújo, Rafael, Arthur Bragança and Juliano Assunção. *Accessibility in the Legal Amazon: Digital Solutions*. Amazon 2030, 2022. bit.ly/AMZDigitalSolutions.

44 Decree no. 7,175, May 12, 2010. bit.ly/4kyIH6w.

For the Amazon, the New PAC provides for the expansion of 4G mobile Internet access and the construction of infovias, which are kilometers of fiber optic cable to enable Internet access. In the case of 4G, the expansion of access in 406 locations in the state of Pará is highlighted. In the case of infovias, of the seven planned for the Amazon, two have been completed.^{45,46,47}

However, the investments in connectivity under the New PAC may not be enough to make up for the shortfall in the Amazon biome main states.⁴⁸ In terms of 4G Internet expansion, although Pará is fifth nationally in terms of the number of locations to be served, the second best-placed state in the biome is Amazonas, which comes in 20th place. The states of Rondônia, Amapá, Roraima and Acre, in that order, occupy the last four positions among the 26 Brazilian states.⁴⁹ In yet another failure of transparency, the New PAC does not explain why the Amazon is neglected compared to the rest of the country, nor why the number of locations to be served is so different between the states in the region.

One piece of data that could have been used to explain this difference is the Brazilian Connectivity Index (*Índice Brasileiro de Conectividade* - IBC), created by the National Telecommunications Agency (*Agência Nacional de Telecomunicações* - ANATEL) to establish a ranking of the country's most Internet-connected municipalities and states. However, the IBC does not seem to have been taken into account in the New PAC decision making. Pará was the fifth least connected state in 2023, which could explain why it was in the same position in terms of the number of locations to be served by the New PAC in the expansion of 4G Internet. However, Acre was the sixth least connected state in 2023, according to the IBC, and ranks last in the number of locations to be served by the New PAC. Minas Gerais, on the other hand, was the ninth most connected state in 2023 and ranks first in the number of locations to be served by the program.⁵⁰

45 Casa Civil. *Novo PAC - Inclusão Digital e Conectividade: Expansão do 4G e implantação do 5G*. nd. Access date: March 7, 2025. bit.ly/4bwkCt2.

46 Casa Civil. *NovoPAC - Inclusão Digital e Conectividade - Infovias*. nd. Access date: March 7, 2025. bit.ly/4kxag7D.

47 Agência Gov. *Infovia of 624 km levará internet de fibra ótica ao interior da região Norte*. 2024. Access date: March 7, 2025. bit.ly/4bwNAJi.

48 Acre, Amapá, Amazonas, Pará, Rondônia and Roraima, which are entirely within the biome.

49 Casa Civil. *Novo PAC - Inclusão Digital e Conectividade - Expansão do 4G e implantação do 5G*. nd. Access date: March 7, 2025. bit.ly/4bwkCt2.

50 Portal Brasileiro de Dados Abertos. *Meu Município - Índice Brasileiro de Conectividade*. nd. Access date: March 7, 2025. bit.ly/4i8Ei8P.

Sanitation

The 2014 National Plan for Basic Sanitation (*Plano Nacional de Saneamento Básico* - PLANSAB) did not provide for actions that address the specific characteristics of the Amazon. A revision of this plan in 2019 acknowledged this shortcoming.⁵¹ The lack of adequate planning for the region explains the great inequality between the Amazon and the rest of Brazil in the coverage of water and sewage services. For example, the percentage of households with access to a sewage system in the cities of the Legal Amazon in 2022, the date of the last census, was 19.3%,⁵² against a national average of 64.69%.⁵³ There is also less access to piped water in rural areas of the region, compared to rural areas in the rest of the country.⁵⁴ Even in the capital cities of the Amazon, access rates are lower than the national average.⁵⁵ Among those located in the Amazon biome,⁵⁶ only the capital of Acre, Rio Branco, exceeds the national average for access to the sewage network, while only the capital of Roraima, Boa Vista, exceeds the national average for access to piped water.⁵⁷ Investments in the Amazon's sanitation infrastructure could help reduce illness and mortality rates⁵⁸ and create better conditions for the region's development.

Of the 550 sanitation actions proposed by the New PAC, only 28 are located in the main states of the Amazon biome.⁵⁹ These actions cover, on average, 67% of the municipalities in these states and mainly deal with studies for the concession to the private sector of sanitation networks in urban areas. The states in the biome with the highest percentage of municipalities served by some action under the New PAC are Pará and Rondônia—100% and 92% respectively. In third place is Acre, with only 14% of municipalities served.⁶⁰

51 MCID. *Plansab Revisão de 2019*. 2024. Access date: March 13, 2025. bit.ly/4iKwbze.

52 Santos, Daniel et al. *Fatos da Amazônia 2024*. Amazônia 2030, 2024. bit.ly/3TS4YRi.

53 IBGE. *Censo 2022: Domicílios*. 2023. Access date: March 13, 2025. bit.ly/3Fuu3gl.

54 Chein, Flávia and Igor V. Procópio. *As Cidades na Amazônia Legal: Diagnóstico, Desafios e Oportunidades para Urbanização Sustentável*. Amazon 2030, 2022. bit.ly/3Y7Fthg.

55 The average access to piped water in Brazil is 83.88%. Learn more at: IBGE. *Censo 2022: Domicílios*. 2023. Access date: March 13, 2025. bit.ly/3Fuu3gl.

56 Rio Branco/AC, Macapá/AP, Manaus/AM, Belém/PA, Porto Velho/RO and Boa Vista/RR.

57 IBGE. *Censo 2022: Domicílios*. 2023. Access date: March 13, 2025. bit.ly/3Fuu3gl.

58 Rocha, Rudi et al. *A saúde na Amazônia Legal: Evolução recente e desafios em perspectiva comparada*. Amazon 2030, 2021. bit.ly/4lh2Leg.

59 Casa Civil. *Novo PAC - Cidades Sustentáveis e Resilientes: Esgotamento sanitário*. nd. Access date: March 13, 2025. bit.ly/4dy4whQ.

60 Ibid.

Rondônia and Pará have, respectively, the second and third worst percentages of households with access to sanitation networks among these states. Roraima has the best rates, though access to the sewage system is far below the national average. This would justify, at least in part, the targeting of efforts by the New PAC.

However, the case of Amapá is noteworthy. Among the main states in the biome, it has the worst percentage of households with access to sanitation networks,^{61,62} but is only expected to receive one action under the New PAC, in the state capital, Macapá.⁶³ Once again, the program does not explain what criteria guided the distribution of investments, denoting a disconnect between the program and the territory.

Energy

The Amazon is an exporter of renewable energy to the rest of Brazil. Four of the country's five main hydroelectric dams are located in the region, which produces a fifth of the country's energy while consuming only 12% of it.⁶⁴ On the other hand, around 15% of the region's inhabitants—around three million people—only have access to fossil fuel electricity, generated by thermoelectric plants that use diesel fuel to produce power. As well as being highly polluting, these plants provide more expensive and lower quality electricity, due to the price and logistics transporting diesel oil. As a result, municipalities that depend on thermoelectric plants develop less than those with access to clean, cheaper, and better quality energy.^{65,66}

The New PAC foresees the installation of seven thermoelectric plants in three of the main states of the Amazon biome. There will be six plants that will use natural gas to produce energy—four in Amazonas and two in Pará—and one

61 IBGE. *Censo 2022: Domicílios*. 2023. Access date: March 13, 2025. bit.ly/3Fuu3gl.

62 Governo do Estado do Amapá. *Índice de atendimento urbano de esgoto*. 2016. Access date: March 13, 2025. bit.ly/3Rfpg5l.

63 Casa Civil. *Novo PAC - Cidades Sustentáveis e Resilientes - Esgotamento sanitário*. nd. Access date: March 13, 2025. bit.ly/4dy4whQ.

64 Dutra, Joisa and Diogo L. Romeiro. *Caminhos para a Transição Energética na Amazônia*. Amazon 2030, 2024. bit.ly/4j9wowJ.

65 Schutze, Amanda and Rhayana Holz. *Retrato da Energia na Amazônia Legal e a Democratização dos Dados*. Rio de Janeiro: Climate Policy Initiative, 2023. bit.ly/DataZoomAMZ.

66 Schutze, Amanda, Luiz Bines, and Juliano Assunção. *Diesel Rivers in the Legal Amazon: Why Does the Region with Brazil's Biggest Hydroelectric Plants Still Rely on Expensive, Dirty Fuel?* Rio de Janeiro: Climate Policy Initiative, 2022. bit.ly/3WhopKr.

plant that will use biofuels, in Roraima, the only Brazilian state that is not connected to the National Interconnected System (*Sistema Interligado Nacional* - SIN) and is served by thermoelectric plants.⁶⁷ Natural gas is a fossil fuel and therefore an emitter of GHGs, but it is less polluting than diesel oil. Biofuels are a renewable energy source. The use of natural gas in electricity generation is misaligned with the “Lights for All” Program, which aims to serve populations in remote areas of the Amazon and has among its goals the decarbonization of the region’s energy matrix through the use of renewable sources.⁶⁸ but is partly in line with the Program to Accelerate the Energy Transition (*Programa de Aceleração da Transição Energética* - PATEN), created, among other objectives, to implement sustainable energy plants, but which provides for the use of natural gas in electricity production to replace higher-emission energy sources.⁶⁹

Criticism of Paten’s inconsistency also extends to the New PAC. According to these critics, encouraging long-term investments in energy production using natural gas is delaying the country’s plans to decarbonize the electricity system.⁷⁰ For the same reasons, criticism also applies to the Amazon Energy Program. This program states the goal of reducing diesel use in electricity generation,⁷¹ but in practice, it primarily envisions replacing diesel-fired thermal power plants with natural gas thermal plants in the region.⁷²

67 Casa Civil. *Novo PAC - Transição e Segurança Energética - Geração de Energia*. nd. Access date: September 10, 2024. bit.ly/3Y6oHIT.

68 Decree no. 11,628, August 4, 2023. Art. 2, V. bit.ly/4jvyR3j.

69 Law no 15,103, January 22, 2025. Art. 3, § 1, II. bit.ly/4izTjAH.

70 IEMA. *Inserir o gás como opção de transição energética atrasa a descarbonização do Brasil*. 2024. Access date: March 17, 2025. bit.ly/3FtDbIF.

71 Decree no. 11,648, August 16, 2023. bit.ly/3NaIYOM.

72 Campos Jr., Geraldo. *Governo cria programa para reduzir térmicas a diesel na Amazônia*. Poder 360. 2023. Access date: March 17, 2025. bit.ly/4hEf2pO.

Recommendations for the Regional Development of the Amazon through Infrastructure

Despite the demand for infrastructure investments in the Amazon, structural flaws persist in the governance of investments. The fragility of the New PAC forms part of this context and reflects, to a large extent, the lack of planning for the Amazon at a regional level that ensures greater rationality and integrity for the projects included in the program.

The New PAC includes projects that could cause considerable socio-environmental impacts in the Amazon, such as the construction of Ferrogrão and the paving of the BR-319 highway, which cause deforestation, as well as initiatives that could increase GHG emissions and other pollutants, such as the installation of natural gas thermoelectric plants in the region. At the same time, the distribution among the states of the investments in the New PAC portfolio that respond to local demand for quality infrastructure is not necessarily related to the lack of existing infrastructure, demonstrating a disconnect between the program and the territory.

Therefore, before making recommendations for the New PAC in relation to each sector analyzed, **general recommendations** aimed at regional development and implementation of sustainable infrastructure in the Amazon should be considered.

Firstly, it is necessary to establish a comprehensive development plan for the Amazon on a regional scale, which will serve as a reference for other plans and programs, such as investments in infrastructure. This broad development plan must recognize the region's greatest difficulties, stemming from its continental size, demographics, and socio-environmental challenges, and must seek to reduce the disparity with the rest of Brazil in terms of health, education, and infrastructure. At the same time, the plan must recognize the heterogeneity of the region, with different patterns of human occupation and land use,

and its distinct needs, proposing specific solutions for each of the universes found in the region.⁷³

In addition, it is necessary for the long-term plans for the logistics sector, such as the Brazilian's National Logistics Plan (*Plano Nacional de Logística - PNL*) and other sectoral plans, to have a vision for the Amazon, which is currently not the case. It is also important that the plans spell out the socio-environmental criteria adopted and what weight they will have in the selection of projects included in the sectoral planning. An update of the PNL is currently being drawn up by the Federal Government and its Governance Committee. This is the PNL 2050, an opportunity to incorporate social and environmental risks into the strategic planning of the transport sector, taking into account the future of the Amazon and the way its natural resources are used.

The integration of infrastructure plans and programs that provide for investments in the Amazon with other public policies in force in the region is fundamental to the success of initiatives such as the New PAC. In particular, efforts should be made to align the infrastructure projects included in the program's portfolio with the national targets for reducing deforestation in the Amazon, as established in the PPCDAM.⁷⁴

It should also be emphasized that infrastructure plans should provide for a **decision-making process with well-defined stages and clear competencies**, and should be conducted **transparently**, making clear the potential socio-environmental impacts of investments—since the impacts of projects located there are typically greater than in the rest of the country—and explaining why they were chosen, why they may have been allocated less to the Amazon and why they were distributed unevenly among the region's states, especially, in the case of the New PAC, in the sanitation and connectivity sectors.

In this sense, it is essential that information on the New PAC is always updated on its official website, including on (i) the criteria used to include projects in the program, (ii) the technical, economic and environmental viability of the projects, (iii) the environmental licensing of the projects, (iv) consultations

⁷³ Learn more at: Veríssimo, Beto et al. *The Five Amazons: Basis for the Sustainable Development of the Brazilian Amazon*. Amazon 2030, 2022. bit.ly/3Yg1xpG.

⁷⁴ Objective 11 of Axis III of the Plan. Learn more at: MMA. *Action Plan for the Prevention and Control of Deforestation in the Legal Amazon (PPCDAM) - Fifth Phase (2023-2027)*. 2023. Access date: April 15, 2025. bit.ly/4ermHHL.

with the affected populations, (v) monitoring the execution of the projects, and (vi) criteria for defining which projects should be executed with priority

As for the **sectoral recommendations**, some adjustments would allow the New PAC to advance more efficiently toward greater regional integration and sustainable development in the region, generating more significant local benefits.

In the **logistics sector**, the expansion of infrastructure would have fewer negative socio-environmental impacts in the so-called Deforested Amazon, which covers municipalities that have lost more than 70% of their original forest, while facilitating rural producers' access to technical assistance, expanding production flow capacity, strengthening access to basic health, education and security services and, consequently, reducing the advance of deforestation due to migratory pressures. The Forest Amazon and the Amazon Under Pressure⁷⁵ should undergo more thorough impact assessments by improving the quality of the technical, economic, and environmental feasibility studies (EVTEA)⁷⁶ and the methodology for analyzing the areas of direct and indirect influence of projects, especially in the case of land transport infrastructure.⁷⁷

In the **connectivity sector**, it is essential to expand Internet services in the Forest Amazon, where the presence of communities poses greater challenges; in the Deforested Amazon, due to low social progress; and in the Urban Amazon, especially in small- and medium-sized towns and on the outskirts of large cities. In addition to Pará, the Internet must also reach a greater number of locations in the states of Rondônia, Amapá, Roraima, and Acre, which occupy the last four positions among the Brazilian states to be served by the New PAC.

In the **sanitation sector**, the greatest demand is in the urban Amazon, and the New PAC's actions are concentrated in cities in Pará and Rondônia. There needs to be a greater number of actions for the cities of Acre, Amazonas, and, above all, Amapá, which has the lowest proportion of households with access to sanitation networks in the region. It would also be desirable for the New PAC

75 The Forest Amazon includes municipalities with only 5% deforested areas, while the Amazon Under Pressure corresponds to municipalities with extensive forest cover, but that suffer from growing deforestation, illegal logging, gold mining, and land grabbing, logistical infrastructure projects. Learn more at: Veríssimo, Beto et al. *The Five Amazons: basis for the sustainable development of the Brazilian Amazon*. Amazon 2030, 2022. bit.ly/3Yg1xpC.

76 Antonaccio, Luiza and Joana Chiavari. *Strengthening environmental studies for federal land infrastructure concessions*. Rio de Janeiro: Climate Policy Initiative, 2021.

77 Araújo, Rafael, Arthur Bragança, and Juliano Assunção. *Accessibility in the Legal Amazon: Delimitation of the Area of Influence and Environmental Risks*. Amazon 2030, 2022. bit.ly/AMZInfluenceRisks.

to provide for efforts to install septic tanks comprehensively in Amazon that do not have sewage collection systems. This simple solution has great potential to improve the sanitary conditions of the region's inhabitants and boost social development.⁷⁸

In the **energy sector**, the New PAC includes almost no efforts to generate electricity from renewable sources in the Amazon. Although it is partly aligned with Paten and the Amazon Energy Program, it seeks to serve the 15% of the population who only have access to electricity through diesel thermoelectric plants through long-term investments in the installation of natural gas plants, which also emit GHGs. The New PAC should promote the installation of solar and wind power plants⁷⁹ and encourage so-called distributed generation, which is the generation of electricity through the installation of small generators, usually from renewable sources, on site or close to the place of consumption.⁸⁰ These actions would be in line with the objectives of the Light for All Program and the rules of the Brazilian Electricity Regulatory Agency (*Agência Nacional de Energia Elétrica* - ANEEL), which regulate distributed generation on a local scale and generation for individual consumption, in both cases using renewable sources.^{81,82,83,84} They would also contribute to the energy decarbonization of the Amazon, without incurring the high costs and risks of connecting the isolated areas of the region to the national energy grid.

78 Chein, Flávia and Igor V. Procópio. *As Cidades na Amazônia Legal: Diagnóstico, Desafios e Oportunidades para Urbanização Sustentável*. Amazon 2030, 2022. bit.ly/3Y7Fthg.

79 Dutra, Joisa and Diogo L. Romeiro. *Caminhos para a Transição Energética na Amazônia*. Amazon 2030, 2024, p. 5. bit.ly/3Y2SNmD.

80 Schutze, Amanda and Rhayana Holz. *Retrato da Energia na Amazônia Legal e a Democratização dos Dados* Rio de Janeiro: Climate Policy Initiative, 2023. bit.ly/DataZoomAMZ.

81 Dutra, Joisa and Diogo L. Romeiro. *Caminhos para a Transição Energética na Amazônia*. Amazon 2030, 2024, p. 75. bit.ly/3Y2SNmD.

82 Normative Resolution no. 1000/2021. bit.ly/4jAVbth.

83 Normative Resolution no. 493/2012. bit.ly/4lywNKp.

84 Normative Resolution no. 83/2004. bit.ly/4imQmTn.

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About Amazon 2030

Amazon 2030 is an initiative by Brazilian researchers that seeks to develop an action plan for the sustainable development of the Brazilian Amazon. Our objective is to promote higher standards of economic and human development and to achieve the sustainable use of resources by 2030.

About Climate Policy Initiative

Climate Policy Initiative (CPI) is an organization with international expertise in finance and policy analysis. CPI has seven offices around the world. In Brazil, CPI has a partnership with the Pontifical Catholic University of Rio de Janeiro (PUC-RIO). CPI/PUC-RIO works to improve the effectiveness of public policies and sustainable finance in Brazil through evidence-based analysis and strategic partnerships with members of the government, civil society, the private sector and financial institutions.

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