



Safeguarding Planetary Health in the Bolivian Amazon: A Call to Action Against Deforestation

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[This policy brief explores the link between human and environmental health through the lens of the Bolivian Amazon, analysing the far-reaching consequences of escalating deforestation in the region.]

Humanity is facing an unprecedented range of crises. Deeply interconnected issues such as **climate change, ecological degradation and widening inequalities** affect not only the sustainability of the planet's resources, but also the well-being of communities and consequently, the fate of generations to come.¹ Without **urgent and decisive action from international and national leaders**, the continued

destruction of ecosystems such as the Amazon will compromise the health and livelihoods of current and future generations, disproportionately affecting vulnerable and marginalized populations.

The **Planetary Health** approach takes into account the undeniable connections between human and environmental health, recognizing that the **sustainable stewardship of natural ecosystems** is

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¹ National Academies of Sciences, Engineering, and Medicine. Nobel Prize Laureates and other experts issue urgent call for action after 'Our Planet, Our Future' Summit. Washington (DC): National Academies; 2021. Available from: <https://www.nationalacademies.org/news/2021/04/nobel-prize-laureates-and-other-experts-issue-urgent-call-for-action-after-our-planet-our-future-summit>.

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essential for protecting public health outcomes.²

Nestled within this framework, this policy brief explores the **link between human and environmental health through the lens of the Bolivian Amazon**, analysing the far-reaching consequences of escalating deforestation in the region. Drawing on recent research and health impact assessments, it underscores the

interconnected effects on ecosystems, health and well-being, and equity, particularly for vulnerable communities. The brief concludes with **strategic, evidence-based discussion points and recommendations for policymakers to address this growing crisis** ●

What is the Planetary Health Approach?

Planetary Health is an emerging concept with an interdisciplinary approach that recognises the deep interdependence between human health and the health of the planet. It is based on the idea that people's well-being depends on stable and functional ecosystems, and that environmental degradation directly threatens our health and quality of life.³

This paradigm is grounded in the concept of **planetary boundaries**, which defines the thresholds that should not be exceeded in key processes such as climate change or biodiversity loss. Crossing these limits can lead to irreversible impacts on both natural systems and human populations, especially the most vulnerable.^{4,5}

In the face of these challenges, Planetary Health promotes integrated, sustainable, and equitable solutions. It fosters collaboration across disciplines, the inclusion of local and traditional knowledge, and collective action to build a future where human development and environmental protection go hand in hand.⁶

² Whitmee S, Haines A, Beyrer C, Boltz F, Capon AG, Dias BFD, et al. Safeguarding human health in the Anthropocene epoch: report of The Rockefeller Foundation–Lancet Commission on planetary health. *Lancet*. 2015 Nov;386(10007):1973–2028.

³ Mago A, Dhali A, Kumar H, Maity R, Kumar B. Planetary health and its relevance in the modern era: A topical review. *SAGE Open Med*. Jan 2024;12:20503121241254231.

⁴ Kemarau RA, Sakawi Z, Eboy OV, Anak Suab S, Ibrahim MF, Rosli NNB, et al. Planetary boundaries transgressions: A review on the implications to public health. *Environ Res*. noviembre de 2024;260:119668.

⁵ Prescott SL. Planetary health. *Ann Allergy Asthma Immunol*. diciembre de 2024;133(6):649–57.

⁶ O'Callaghan-Gordo C PA. Cinco conceptos para entender el nuevo paradigma de salud planetaria. Blog Salud con Ciencia. Universitat Oberta de Catalunya. 2022. Disponible en: <https://blogs.uoc.edu/cienciasdelasalud/es/5-conceptos-para-entender-que-es-salud-planetaria>.

1. The Bolivian Amazon: A Vital Ecosystem Under Threat

“The primary causes of deforestation in Bolivia are deeply interlinked and rooted in a political and economic model that prioritizes agricultural expansion and extractive industries.”

The **Amazon region**, distributed mainly across Brazil, Peru, Bolivia, Colombia and Venezuela, hosts an area the size of Australia, stores more than 150,000 billion tons of carbon and houses one of the richest biomes of the planet.⁷ Often called “*the lungs of the earth*”, the **Amazon rainforest** plays a pivotal role in maintaining planetary and public health by providing global climate stability, regulating water cycles, and biodiversity conservation. In addition to environmental regulation, the Amazonian rainforests also contribute critically to the

quality of life through provision of valuable products and materials such as those for life-saving medicines and also functions as a source of identity and belonging for its people.⁸ The Bolivian Amazon is the cornerstone of this ecosystem and one of the world’s richest regions in biodiversity. It provides essential ecosystem services—from carbon sequestration and climate regulation to freshwater cycling and disease regulation—many of which directly impact public health and well-being across South America and beyond.⁹



Source: ©medicusmundi mediterrania.

Intensified deforestation and other anthropogenic actions in the Amazon are leading to a severe **dysregulation of the planet’s environmental balance and impacting health outcomes**. Estimates from MapBiomas suggest that up until 2018, the Amazon had lost approximately 15% of its original forest area to deforestation.^{10,11} Although Brazil accounts for the vast majority of the Amazon, **Boliv-**

ia presents one of the **highest rates of primary forest loss in the world**, a rate that has **significantly increased in the past years**—According to Global Forest Watch, Bolivia lost approximately 8 million hectares of tree cover between 2001 and 2023.¹² In 2024 alone, wildfires in the country burned an estimated 12.6 million hectares (11,5% of the Bolivian territory). More than half of the area burned consist-

⁷ Chowdhury R, Talukder B, Basta PC, Olivero-Verbel J, Polson-Edwards K, Galvao L, et al. Saving the Amazon in South America by a regional approach on climate change: the need to consider the health perspective. *Lancet Glob Health*. 2024 Jun;12(6):e913–5.

⁸ Foley JA, Asner GP, Costa MH, Coe MT, DeFries R, Gibbs HK, et al. Amazonia revealed: forest degradation and loss of ecosystem services. *Front Ecol Environ*. 2007 Jan;5(1):25–32. Available from: [https://esajournals.onlinelibrary.wiley.com/doi/full/10.1890/1540-9295\(2007\)5\[25:ARFDAL\]2.0.CO;2](https://esajournals.onlinelibrary.wiley.com/doi/full/10.1890/1540-9295(2007)5[25:ARFDAL]2.0.CO;2).

⁹ Wägele W. Biodiversity and climate change in the Amazon. In: Beck E, Bendix J, Kottke I, Makeschin F, Mosandl R, editors. *Gradients in a tropical mountain ecosystem of Ecuador*. Berlin: Springer; 2008. p. 447–56.

¹⁰ Berenguer, Erika, Dolores Armenteras, Alexander C. Lees, Philip M. Fearnside, Charles C. Smith, et al. “Chapter 19: Drivers and Ecological Impacts of Deforestation and Forest Degradation.” In *Amazon Assessment Report 2021*, edited by Carlos Nobre, Alejandro Encalada, Edward Anderson, F. H. Roca Alcazar, Mercedes Bustamante, et al. New York: United Nations Sustainable Development Solutions Network, 2021. <https://www.theamazonwewant.org/spa-reports/>. <https://doi.org/10.55161/AIZ11133>.

¹¹ Ellwanger JH, Kulmann-Leal B, Kaminski VL, Valverde-Villegas JM, Veiga ABGD, Spilki FR, et al. Beyond diversity loss and climate change: Impacts of Amazon deforestation on infectious diseases and public health. *An Acad Bras Ciênc*. 2020 Apr 17;92:e20191375.

¹² Vizzuality. Bolivia deforestation rates & statistics | Global Forest Watch. Washington (DC): World Resources Institute; [cited 2025 Apr 11]. Available from: <https://www.globalforestwatch.org/dashboards/country/BOL?category=forest-change>

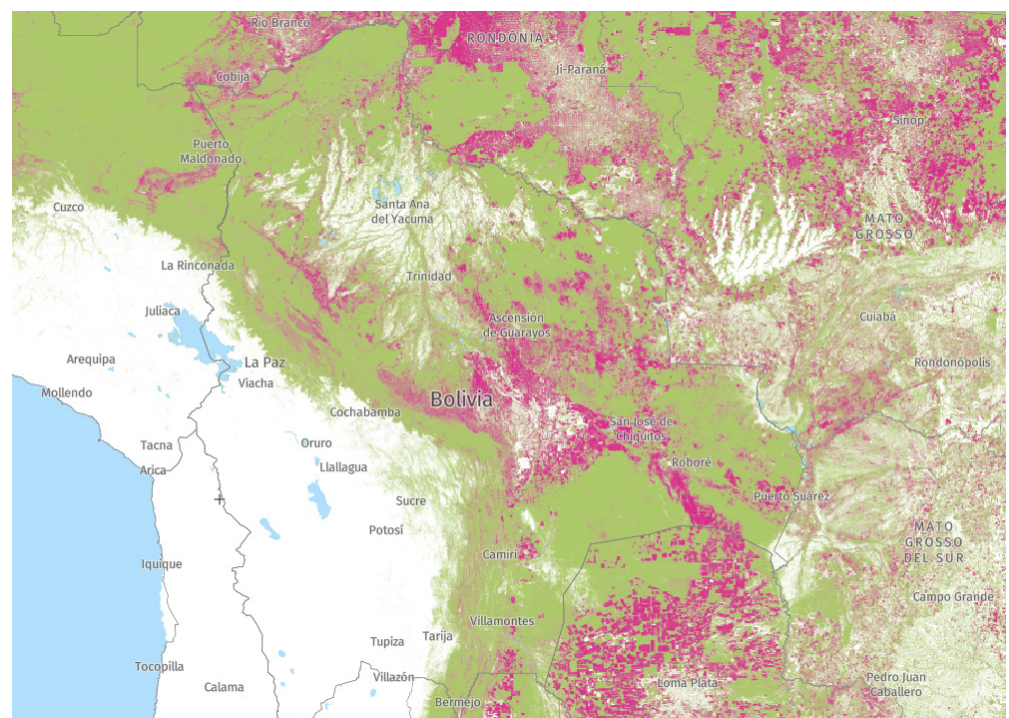
ed of forests, marking the most extensive fire season in the country's history.¹³

The primary causes of deforestation in Bolivia are deeply interlinked and rooted in a political and economic model that prioritizes agricultural expansion and extractive industries. Deforestation in Bolivia has been driven primarily by conversion of forest land - often illegally through the use of fire and land speculation - to make way for large-scale cattle ranching and the cultivation of export-driven commodities such as soy and palm oil, frequently led by powerful agro-industrial actors.^{14,15}

Bolivia's deforestation rate is among the highest in South America, which is also

driven by low agricultural productivity and the speculative clearing of land to secure tenure and increase its value.¹⁶ Moreover, subsequent infrastructure development—particularly road construction—functions as a key enabler of this system, providing access to remote forest areas and facilitating further illegal clearing, land grabbing, and resource extraction.¹⁷ While land clearing through fire is technically illegal, **weak enforcement, government policies and economic reliance on commodity-driven deforestation** has facilitated forest loss in Bolivia at an unprecedented scale.¹⁷

Figure 1. Deforestation in Bolivia (2001-2023)



Source: Global Forest Watch.

■ Tree Cover. ■ Tree Cover Loss.

The accelerating pace of deforestation and forest degradation in the Bolivian Amazon has had a significant impact on environmental health and regulatory systems. This has led to a loss of biodiversity, rise in carbon emissions contributing to cli-

mate change, global warming, disruption of weather cycles, and more. It has been estimated by the The Intergovernmental Panel on Climate Change (IPCC) that deforestation leads to approximately 10-15% of total global carbon emissions, thus

¹³ Czaplicki, Stasiek. 2025. "2024 negro: 12,6 millones de hectáreas arrasadas en el peor año de incendios de la historia boliviana." Revista Nómadas, 24 de abril de 2025. <https://revistanomadas.com/2024-negro-126-millones-de-hectareas-arrasadas-en-el-peor-ano-de-incendios-de-la-historia-boliviana/>.

¹⁴ Müller R, Pacheco P, Montero JC. The context of deforestation and forest degradation in Bolivia: Drivers, agents and institutions. Bogor: Center for International Forestry Research (CIFOR); 2014. Available from: <https://www.cifor-icraf.org/knowledge/publication/4600/>.

¹⁵ Berenguer, Erika, Dolores Armenteras, Alexander C. Lees, Philip M. Fearnside, Charles C. Smith, et al. "Chapter 19: Drivers and Ecological Impacts of Deforestation and Forest Degradation." In Amazon Assessment Report 2021, edited by Carlos Nobre, Alejandro Encalada, Edward Anderson, F. H. Roca Alcazar, Mercedes Bustamante, et al. New York: United Nations Sustainable Development Solutions Network, 2021. <https://www.theamazonwewant.org/spa-reports/>. <https://doi.org/10.55161/AIZJ1133>.

¹⁶ Global Canopy. The hidden crisis of deforestation in Bolivia [Internet]. Oxford: Global Canopy. Available from: <https://globalcanopy.org/insights/insight/the-hidden-crisis-of-deforestation-in-bolivia/>.

¹⁷ Welt Hunger Hilfe. Bolivia: In view of the deforestation alert, a new national and global pact on climate justice and sustainable forest management is urgently needed. Bonn: WHH; 2022.

directly contributing to global climate change.¹⁸ Estimates of Bolivia's carbon emissions show that they have continued to increase over the past two decades and the majority of them are deforestation induced.¹⁹ Furthermore, studies conducted in the Chiquitania region in Bolivia,

an area facing increasing deforestation, conclusively show a significant relationship between deforestation and increasing temperatures in the region.²⁰ These environmental impacts extend far beyond the borders of Bolivia and the Amazon ●

2. The Human Toll: Health, Inequality, Displacement, and Declining Quality of Life

“In Bolivia, the rapidly increasing loss of forest cover, especially through burning and other industrial activities, has created hazardous living conditions for many communities, especially indigenous peoples and those in rural or low-income areas.”

The degradation of the Amazon does not only include environmental consequences, rather it extends deeply into the health and well-being of people and communities who live within and around it. Some of these effects are already a reality. In Bolivia, the rapidly increasing loss of forest cover, especially through burning and other industrial activities, has created hazardous living conditions for many communities, especially indigenous peoples and those in rural or low-income areas.

This unique ecosystem of the Amazon has prevented many **arboviruses**, isolated in their sylvatic cycle, from making contact with human hosts and spreading across frontiers. The recent **Oropouche epidemic** across the Amazon, including Bolivia, has reaffirmed the importance of the natural barrier provided by the rainforest. Since the end of 2023 many regions in the Americas and the Caribbean, not endemic to this virus, have declared

outbreaks of the viral disease.^{21,22} There is scientific evidence that these **outbreaks are linked to vegetation loss** in the period immediately preceding their occurrence.²³ Additionally, biodiversity loss further compounds these health risks, as it disrupts ecosystems that regulate infectious diseases, undermines food security (especially for indigenous peoples and rural communities), and reduces access to key resources.²⁴

The impacts of deforestation and loss of biodiversity on human health are not only associated with vector-borne diseases, but also with the direct effects of particulate matter and water pollutants derived from **forest fires, burning biomass or mining**.^{25,26} An increase in **respiratory diseases related** to augmented fires in the Amazon in 2019 has already been documented.²⁷ There are also estimations using air-quality data that attribute thousands of deaths and increase in hos-

¹⁸ Obani IP, Obani ZI, Anaeto FC, Akroh TO, Nwachukwu CS. *Impact of deforestation on carbon emissions: A data-driven study of the Amazon and Southeast Asia* [Internet]. 2022. Available from: <https://ejlss.es/index.php/ejls/article/view/80>.

¹⁹ Andersen LE, Doyle AS, Del Granado S, Ledezma JC, Medinaceli A, Valdivia M, et al. Net Carbon Emissions from Deforestation in Bolivia during 1990–2000 and 2000–2010: Results from a Carbon Bookkeeping Model. *PLoS ONE*. 2016 Mar;11(3):e0151241. Available from: <https://doi.org/10.1371/journal.pone.0151241>.

²⁰ Maillard O, Vides-Almonacid R, Salazar Á, Larrea-Alcazar DM. Effect of deforestation on land surface temperature in the Chiquitania region, Bolivia. *Land* [Internet]. 2023 Jan;12(1):2. Available from: <https://doi.org/10.3390/land12010002>.

²¹ Pan American Health Organization. *Enfermedad por virus Oropouche* [Internet]. Washington (DC): PAHO; 2024. Available from: <https://www.paho.org/es/temas/enfermedad-por-virus-oropouche>.

²² Cheng Q, Rees EE, Roche B, López R, Cristinacce A, Cavers S, et al. Environmental drivers of Oropouche virus transmission in South America. *J Travel Med*. 2024 May;32(3):taaf018. Available from: <https://academic.oup.com/jtm/article/32/3/taaf018/8046862?login=false>.

²³ Romero-Alvarez D, Escobar LE. Vegetation loss and the 2016 Oropouche fever outbreak in Peru. *Mem Inst Oswaldo Cruz*. 2017 Apr;112:292–8.

²⁴ Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). *Global assessment on biodiversity and ecosystem services: Summary for policymakers and full report*. 2019. Available from: <https://zenodo.org/records/6417333>.

²⁵ de Oliveira Alves N, Vessoni AT, Quinet A, Fortunato RS, et al. Biomass burning in the Amazon region causes DNA damage and cell death in human lung cells. *Sci Rep*. 2017 Sep 7;7:10937.

²⁶ Passos CJS, Mergler D. Human mercury exposure and adverse health effects in the Amazon: a review. *Cad Saude Publica*. 2008;24 Suppl 4:S503–20. doi:10.1590/s0102-311x2008001600004.

²⁷ Observatório de Clima e Saúde. *Queimadas na Amazônia e seus impactos na saúde: A incidência de doenças respiratórias no sul da Amazônia aumentou significativamente nos últimos meses* [Internet]. Available from: <https://climaesaude.iciet.fiocruz.br/queimadas-na-amazonia-e-seus-impactos-na-saude-incidencia-de-doencas-respiratorias-no-sul-da>.

pitalisations linked to deforestation in the Amazon due to the 2019 and 2024 fires.²⁸ Furthermore, **deforestation** can indirectly affect health through the **increase of temperatures which in turn aggravate chronic conditions** and quality of life.²⁹

A recent example of this escalating crisis occurred in September 2024, when the Bolivian president declared a National Emergency in response to extreme environmental pollution caused by widespread fires, the largest in the past 20 years.³⁰ While the majority of the devastation from the fires was concentrated in Santa Cruz and Beni, several other cities in the country were greatly affected - approximately 50 local governments in Bolivia declared emergencies due to fires and droughts.^{31,32} The resulting smoke from the fires reached several other cities such as Cochabamba, La Paz, and Cobija, and even crossed borders into Brazil and Argentina.³³

Health authorities reported **sharp increases in respiratory illnesses**, including pneumonia, as well as conditions like conjunctivitis.^{34,35} The dense smoke

not only had an intense environmental and public health impact, but also severely disrupted daily life, forcing school closures, flight cancellations, and the suspension of outdoor activities for several months.^{36,37} Residents were advised to stay indoors during the emergency, which lasted several months, but for many, this was not a viable option. In cities like Riberalta, where most homes lack glass windows, indoor spaces were as smoke-filled as the outdoors. Those who depend on daily earnings from outdoor work had little choice but to endure prolonged exposure to hazardous air quality.

In response to this crisis, the Pan American Health Organization (PAHO) prioritized assessing the health impacts, focusing on respiratory issues and the worsening of chronic conditions.³⁸ These events underscore the critical need to **establish a systematic health impact assessment in the region to inform actions, policies, and preparedness to climate emergencies and risks.**



Source: @medicushmani mediterrània.

²⁸ Butt EW, Conibear L, Knot C, Spracklen DV. Large air quality and public health impacts due to Amazonian deforestation fires in 2019. *GeoHealth*. 2021;5(7):e2021GH000429.

²⁹ Ebi KL, Capon A, Berry P, Broderick C, de Dear R, Havenith G, et al. Hot weather and heat extremes: health risks. *Lancet*. 2021 Aug 21;398(10301):698–708.

³⁰ Ministerio de Defensa. *Bolivia declara emergencia nacional por incendios forestales y coordina el apoyo de organismos internacionales y países amigos para sofocar el fuego* [Internet]. Estado Plurinacional de Bolivia; 2024 Sep. Available from: <https://www.mindef.gob.bo/node/1027>.

³¹ Fundación TIERRA. Reporte de incendios forestales en Bolivia. Documento de trabajo n.º 254. La Paz: Fundación TIERRA, 2024. <https://www.ftierra.org/index.php/publicacion/documentos-de-trabajo/254-reporte-de-incendios-forestales-en-bolivia>.

³² Ministerio de Defensa de Bolivia. Plan Nacional de Prevención y Reducción de Riesgos de Incendios Forestales. La Paz: Ministerio de Defensa, 2021. https://www.defensacivil.gob.bo/web/uploads/images/doc_20210824_184831.pdf.

³³ Los Tiempos. “Cobija declara emergencia sanitaria por el humo de los incendios forestales.” Los Tiempos, 4 de septiembre de 2024. <https://www.lostiempos.com/actualidad/pais/20240904/cobija-declara-emergencia-sanitaria-humo-incendios-forestales>.

³⁴ Brújula Digital. “Aumentan los casos de neumonía y de infecciones respiratorias en la ciudad de La Paz.” Brújula Digital, 5 de septiembre de 2024. <https://brujuladigital.net/sociedad/2024/09/05/aumentan-los-casos-de-neumonia-y-de-infecciones-respiratorias-en-la-ciudad-la-paz-37063>.

³⁵ La Razón. “Salud atendió 6.368 casos afecciones por incendios.” La Razón, 10 de septiembre de 2024. <https://www.la-razon.com/sociedad/2024/09/10/incendios-19/>.

³⁶ UNICEF. *Bolivia humanitarian situation report: Forest fires - 24 September 2024* [Internet]. New York: United Nations Children's Fund; 2024 Sep. Available from: <https://www.unicef.org/media/162571/file/Bolivia-Humanitarian-SitRep-Forest-Fires-24-September-2024.pdf>.

³⁷ Reuters. *Bolivia wildfires rage, smoke turns day into night* [Internet]. Reuters; 2024 Sep. Available from: <https://www.reuters.com/world/americas/bolivia-wildfires-rage-smoke-turns-day-into-night-2024-09-11/>.

³⁸ Organización Panamericana de la Salud (OPS). *Informe de Situación 2 - Incendios Forestales, Bolivia. Septiembre, 2024* [Internet]. Washington (DC): OPS/OMS; 2024. Available from: <https://www.paho.org/es/documentos/informe-situacion-2-incendios-forestales-bolivia-septiembre-2024>.

Box 1. Association between Deforestation and Pneumonia Incidence in the Bolivian Amazon from 2002-2023: An Ecological Study³⁹



This study analyzed data from 2002 to 2023 at the municipal level in the biogeographical region of the Bolivian Amazon. It aimed to assess the association between deforestation and public health, specifically, the impact of tree cover loss caused by fires on pneumonia incidence. Results from the study and other interventions in the project subsequently inform the strategic, evidence-driven policy recommendations for decision-makers presented in this document.

The study was based on population, tree cover loss, pneumonia incidence data and other linked socio-economic variables, collected from 89 municipalities that comprise the Biogeographical region of the Bolivian Amazon, out of the country's total 339.

The study analysed panel data on yearly registered pneumonia cases and the rate of tree cover loss due to fires at the municipal level. Though Bolivia has seen progress in socio-economic indicators in the past two decades, this has occurred while the country has experienced **significant forest loss**. Findings reveal a significant **association between rate of tree cover loss caused by fires and an increase in pneumonia incidence** for the total population living within the Biogeographical Bolivian Amazon. In the model, a 1% increase in the rate of tree cover loss due to fires was associated [p-value 0.02] with a 20% increase in pneumonia incidence [with 95% confidence intervals of 3% to 41%]. Positive trends remained even after vaccine introduction post 2014.

While we must keep in mind some critical limitations of the study —such as inconsistencies in data quality over time and the fact that, as with any ecological study based on group-level associations, we cannot infer individual causality but rather highlight associations— these findings still offer valuable insight. **The study is one of the firsts that explores the health impact of deforestation in the Bolivian Amazon.** It further underscores **pressing need for policy action informed by systematic health impact assessments** to curb deforestation and mitigate its escalating health and environmental impacts on the Bolivian Amazon.

The impacts of deforestation are not distributed equally. Vulnerable populations—including indigenous peoples, rural communities, women, children, and the elderly—bear the brunt of the health, economic, and social consequences. These groups are often already marginalized and lack the resources or political power to adapt or respond. The resulting pressures exacerbate cycles of poverty, food insecurity, and poor health.

The most severe consequences fall disproportionately on already vulnerable and persecuted Indigenous peoples—the guardians of 80% of global diversity—who account for only approximately 6% of the world's population

and lack political power to protect these ecosystems.⁴⁰ They not only receive no part of the economic benefits associated with commodity driven deforestation but rather, their economic development is thwarted in turn due to loss of their lands, the disruption of traditional livelihoods and reduced access to essential resources.⁴¹ In addition to economic development, their health and well-being is also impacted negatively due to consequences such as displacement, water and air pollution, and water and food insecurity. Many indigenous people, particularly women, act as activists representing their communities, protesting deforestation-related activities that threaten their social and environmental realities.

³⁹ This study was conducted by Shannon Leigh O'Brien, Gonzalo Barreix, Daniella Medeiros Cavalcanti, Vincent Antoine Vos, Cristina O'Callaghan Gordo and Davide Rasella part of the "Salud Planetaria: desafíos y oportunidades en el Norte de la Amazonía boliviana" project. For more information on the study methodology, results, and limitations, please contact Shannon O'Brien (shannon.obrien@isglobal.org).

⁴⁰ S. Claudia. *The role of indigenous peoples in biodiversity conservation: the natural but often forgotten partners* [Internet]. Washington (DC): World Bank; [cited 2024 Dec 17]. Available from: <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/995271468177530126/The-role-of-indigenous-peoples-in-biodiversity-conservation-the-natural-but-often-forgotten-partners>.

⁴¹ Confederación Nacional de Trabajadores Indígenas (CNTI). *Informe sobre deforestación y su impacto en las comunidades indígenas* [Internet]. La Paz: CNTI; 2023 [cited 2025 Apr 11]. Available from: <https://www.cntindigena.org/wp-content/uploads/2023/06/informe-deforestacion.pdf>.

Unfortunately, they often face violence from private interests involved in these activities.⁴² The loss of livelihoods due to deforestation, and the resulting climate change-related challenges such as floods

and displacement, disproportionately affect women in Bolivia—especially those from indigenous or rural areas ●⁴³

3. How Can We Improve Planetary Health of the Bolivian Amazon?

“We must prioritise inclusion of environmental sustainability and public health considerations as central to policy making across all sectors and based on comprehensive health impact assessments to ensure inclusive and well-planned development.”

To help protect the Bolivian Amazon and support the well-being of its people, urgent and coordinated action is needed. Deforestation is already harming both the environment and public health, and without intervention, the situation will worsen. As stated in the Lancet Commission report on Planetary Health, the paths to make progress towards its achievement involves the development of an enhanced understanding of the connections between natural systems and health, and address the social determinants of health with an equity perspective through integrated policies.²

Environmental degradation and health outcomes are deeply connected, however, policies do not adequately reflect this cross-sectorial link. A more holistic approach—based on data-driven insights—will lead to smarter decision-making and better outcomes for both people and nature. Bearing in mind the increasing magnitude of impact these issues have, we must prioritise inclusion of **environmental sustainability and public health considerations as central to policy making** across all sectors and based on comprehensive health impact assessments to ensure inclusive and well-planned development. A sustainable path forward must balance environmental conservation, economic development, and the protection of human health.

The following policy recommendations are informed by this cross-cutting Planetary Health perspective and aim to support a healthier and more resilient Bolivian Amazon:



1) Implementing stricter bans and sanctions on land burning and enforcing sustainable land use policies

Despite legal restrictions, land clearing through fire remains prevalent due to lax enforcement, low fines, and political support for deforestation-driven economic activities. The Patriotic Agenda—which has promoted extensive farming as a fundamental pillar of Bolivia’s economy since its implementation nearly a decade ago—has significantly contributed to deforestation.⁴⁴ As a result, between 2016 and 2021, 83% of total deforestation was authorized by government agencies.⁴⁵ Even protected areas (PA) are not shielded from deforestation, particularly municipal-PAs, where deforestation rates are comparable to those of non-protected areas.⁴⁶ This illustrates how political and economic support for agricultural expansion often undermines environmental safeguards and does not take into account potential health impacts.

Weak environmental regulations, lax implementation of sanctions, and political support for and policies that favor de-

⁴² Forest Peoples Programme. *Local Biodiversity Outlooks 2: The contributions of indigenous peoples and local communities to the implementation of the Strategic Plan for Biodiversity 2011–2020 and to renewing nature and cultures* [Internet]. 2020 [cited 2025 Apr 11]. Available from: <https://www.cbd.int/gbo/gbo5/publication/lbo-2-en.pdf>.

⁴³ UN Women. *Strategic Note: Bolivia 2023–2027*. New York: United Nations Entity for Gender Equality and the Empowerment of Women (UN Women); 2023 [cited 2025 Apr 11]. Available from: <https://www.unwomen.org/sites/default/files/2023-11/UN-Women-Strategic-Note-brochure-Bolivia-2023-2027-en.pdf>.

⁴⁴ Welt Hunger Hilfe. Bolivia: In view of the deforestation alert, a new national and global pact on climate justice and sustainable forest management is urgently needed. Bonn: WHH; 2022.

⁴⁵ Climate Diplomacy. *Vanishing trees and lakes: Deforestation in Bolivia’s Amazon*. 2024. Available from: <https://climate-diplomacy.org/magazine/environment/vanishing-trees-and-lakes-deforestation-bolivia-amazon>.

⁴⁶ Torrico LEA, Quispe Gemio G, Choque Sunagua S, Muñoz Quisberth Á, Malky A, Juan Carlos A. *Deforestation and protected areas in Bolivia*. La Paz: SDSN Bolivia; 2023. Available from: <https://sdsnbolivia.org/en/deforestation-and-protected-areas-in-bolivia/>.

forestation, have driven large-scale land clearing. Decision-makers must strengthen regulatory oversight and enforcement mechanisms such as the Forest and Land Authority and the National System of Protected Areas, increase penalties for illegal land clearing, and require comprehensive environmental impact as-

essments for land conversion projects.⁴⁷ Additionally, the national governments must be engaged to reassess the existing policies and laws that enable deforestation in protected areas and to ensure a shift towards policies that promote sustainable land management and use, reforestation, and biodiversity conservation.



Source: ©medicusmundi mediterrània.



2) Promote local, regional and national sustainable economic growth and responsible management of the Amazon's resources

Bolivia stands at a crossroads. Continuing a deforestation-based development model puts both the environment and public health at risk, perpetuating the vulnerability of local communities. Extractive economic models, while generating short-term financial gains, come at a high cost.^{48,49} The country must therefore reorient its economy toward sustainable alternatives that promote inclusive and resilient growth. Alternative development models do exist - international experiences in countries such as Brazil and Peru demonstrate that sustainable economic strategies can promote forest conservation while generating livelihoods and improving community well-being.^{50,51} Bolivia also has the potential to harness its rich biodiversity and forest resources through sustainable enterprises. Investing in eco-

tourism and the responsible commercialization of Amazonian products—such as Brazil nuts, açai, and cacao—can create local jobs while safeguarding biodiversity. Expanding these industries and adding value through local processing and infrastructure investment could foster inclusive economic growth and long-term resilience.⁵² Strengthening public-private partnerships is also key to developing certified, deforestation-free value chains capable of meeting growing international demand, particularly under regulations such as those from the European market.

International climate financing mechanisms, such as the UNFCCC Adaptation Fund and the Green Climate Fund (GCF), are designed to support country-level initiatives that integrate climate adaptation, sustainable development, and biodiversity protection. Bolivia has accessed funding through these mechanisms in the past.⁵³ However, the effectiveness of these initiatives has been

⁴⁷ He Y, Czaplicki Cabezas S, Maillard O, Müller R, Romero-Muñoz A, Romero Pimentel LF, Vadillo A, Vos VA. Enact reforms to protect Bolivia's forests from fire. *Science*. 2025 Jan 16;387(6731):255. doi:10.1126/science.adt8304.

⁴⁸ Mueller R. Causas, actores y dinámicas de la deforestación en Bolivia [Internet]. Available from: <https://www.researchgate.net/profile/Robert-Mueller-17/publication/385525507-Causas-actores-y-dinamicas-de-la-deforestacion-en-Bolivia/links/67293eb15852dd723ca8fb50/Causas-actores-y-dinamicas-de-la-deforestacion-en-Bolivia.pdf>.

⁴⁹ Umbrals. Deforestación en Bolivia: análisis y perspectivas. Available from: <https://ojs.umsa.bo/ojs/index.php/umbrals/article/view/947>.

⁵⁰ Cisneros E, Börner J, Pagiola S, Wunder S. Impacts of conservation incentives in protected areas: The case of Bolsa Floresta, Brazil. Available from: <https://documents1.worldbank.org/curated/en/963101576773519234/pdf/Impacts-of-Conservation-Incentives-in-Protected-Areas-The-Case-of-Bolsa-Floresta-Brazil.pdf>.

⁵¹ Food and Agriculture Organization of the United Nations. Social protection contribution to climate risk and disaster management workshop: concept note. Available from: <https://openknowledge.fao.org/server/api/core/bitstreams/5f10e68f-1f85-4fae-8a8d-dd62411c50a8/content>.

⁵² Müller R, Pacheco P, Montero JC. The context of deforestation and forest degradation in Bolivia: Drivers, agents and institutions [Internet]. [cited 2025 Apr 10]. Available from: <https://www.cifor.org/knowledge/publication/4600/>.

⁵³ Green Climate Fund, "Bolivia," Green Climate Fund, accessed May 6, 2025, <https://www.greenclimate.fund/countries/bolivia>.

subject to debate.⁵⁴ Critics have raised concerns about overestimations of carbon sequestration, potential greenwashing, and the repetition of extractivist practices that do not align with the intended sustainable development goals. Therefore, while international climate finance presents opportunities, it is crucial to ensure that funded projects are transparently managed, socially inclusive, and environmentally effective. Such critiques highlight the need for caution. Accessing international climate finance can present valuable opportunities, but only if funded projects are managed transparently, prioritize social inclusion, and genuinely contribute to environmental protection.

A structural transformation is required toward an Amazonian bioeconomy that prioritizes the sustainable use of natural resources, territorial equity, and long-

term well-being over short-term extractive profits.



3) Incentivise indigenous leadership and inclusion in the policy-making process

Indigenous peoples are the guardians of global biodiversity but remain politically marginalized, the most affected by the impacts of deforestation and often the recipients of violence for protesting against deforestation related activities.^{55,56} Their traditional knowledge and sustainable management of resources can support both conservation and economic growth. Policies must prioritise the protection of indigenous peoples, recognise their contributions to preserving the Amazon, and support their participation as key stakeholders in decision-making regarding environmental protection efforts.



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4) Improve environmental and health monitoring systems

Effective data collection and monitoring systems are the backbone of evidence-based decision-making. In the Bolivian Amazon, the absence of structured, transparent, and accessible data systems has significantly hindered the ability to assess and respond to the health impacts of deforestation. The current health information system is fragmented, inconsistently reported, and often inaccessible to both local authorities and researchers.

These weaknesses were evident during the process of conducting the aforementioned

health impact assessment and other stakeholder engagements during the project. Researchers faced challenges due to outdated or incomplete health records, non-standardised data collection protocols, and changing reporting practices over time. Environmental data, though available through international platforms like Global Forest Watch, are rarely integrated into national health monitoring frameworks. As a result, the link between environmental degradation and health outcomes is poorly documented and underrepresented in public health planning.

To address these challenges, Bolivia must strengthen its environmental and health

⁵⁴ Hiroko Tabuchi, "Is Bolivia's \$1.2 Billion Deal to Protect Its Forests a Climate Boon—or a False Solution?" Inside Climate News, April 8, 2025, <https://insideclimatenews.org/news/08042025/bolivia-carbon-securities-forest-protection-greenwashing/>.

⁵⁵ S. Claudia. *The role of indigenous peoples in biodiversity conservation: the natural but often forgotten partners* [Internet]. Washington (DC): World Bank; [cited 2024 Dec 17]. Available from: <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/995271468177530126/The-role-of-indigenous-peoples-in-biodiversity-conservation-the-natural-but-often-forgotten-partners>.

⁵⁶ Forest Peoples Programme. *Local Biodiversity Outlooks 2: The contributions of indigenous peoples and local communities to the implementation of the Strategic Plan for Biodiversity 2011–2020 and to renewing nature and cultures* [Internet]. 2020 [cited 2025 Apr 11]. Available from: <https://www.cbd.int/gbo/gbo5/publication/lbo-2-en.pdf>.

monitoring infrastructure. This should begin with the **creation of a centralized, integrated data platform** that allows real-time access to both environmental and health indicators. Such a system must be interoperable across different ministries (health, environment, education) and research institutions. **Standardised data collection protocols** should be developed and implemented across all regions, ensuring consistency and comparability. This requires significant investment in digital infrastructure and **training of health professionals, statisticians, and local researchers**, not only in technical skills, but also in understanding the links between environmental and public health.

Improving environmental and health data systems will enable early detection of health crises, facilitate health impact assessments, support targeted resource allocation, and guide preventive interventions. Most importantly, it will empower local governments, researchers, and communities with the knowledge needed to protect both human health and the ecological integrity of the Amazon.



5) Invest in education and research for Planetary Health

Academic institutions have historically played a **central role in driving social change**. They can serve as platforms for generating knowledge and informing policy on environmental and health issues. Training more faculty and researchers in Planetary Health will provide them with knowledge needed to address environmental and health challenges effectively and develop solutions aligned to Planetary Health principles to respond to the complex environmental and health challenges faced in the Bolivian Amazon. Expanding funding for interdisciplinary research on deforestation's impacts on health and climate, integrating Planetary Health principles into curricula, and fostering collaborations between academic institutions, policymakers and civil society can drive long-term progress.



6) Strengthen international regulations on deforestation and promote global cooperation

The protection of the Amazon depends on actions that go beyond national borders. Much of the deforestation in Bolivia is driven by international demand for raw materials. Addressing this challenge requires not only national reforms, but also stronger international regulatory frameworks that align with local conservation goals and promote fair trade.

In 2023, the EU approved the *Deforestation-Free Products Regulation (EUDR)*, aimed at preventing products linked to deforestation —such as cocoa, soy, beef, palm oil, rubber, and wood— from entering the European market. However, in November 2024, the European Parliament voted to postpone its implementation, originally scheduled for January 2025, by 12 months, citing the need to give companies more time to adapt to the strict supply chain traceability requirements. While this regulation represents significant progress, similar binding frameworks are still lacking in other major markets like China and the United States. This regulatory disparity creates loopholes and increases the risk of *land swapping*, in which producers allocate deforestation-free land for EU exports while using deforested land to supply less regulated markets.⁵⁷

Despite the existence of international frameworks and platforms, meaningful enforcement and sustained commitment to climate action remain weak. The upcoming COP30, to be held in Belém, Brazil, in November 2025, presents a crucial opportunity to strengthen international frameworks and improve policy coherence between trade, conservation, and climate action. Symbolically significant as the first UN Climate Summit to be held in the Amazon region, the event is also marked by a troubling contradiction. Reports have revealed significant deforestation in Belém's surroundings to make way for infrastructure to host the event, along with concerns over the substantial carbon footprint of the conference itself.^{58,59}

⁵⁷ García-López GA, Martínez-Alier J, Vázquez F. Transnational forest governance and its discontents: Power asymmetries, uneven geographies and the limits of participatory mechanisms. *Environ Plan C Politics Space*. 2024;42(2). doi:10.1177/14614529241247361.

⁵⁸ Watts, Jonathan. "Will Cop30 in Belém Help or Harm the Amazon?" *The Guardian*, April 25, 2025. <https://www.theguardian.com/environment/2025/apr/25/brazil-host-cop30-climate-talks-amazon>.

⁵⁹ Giraldo, Juan Camilo, and Rhea Khoury. "The Climate Paradox." *IAAC Blog*, March 25, 2024. [https://blog.iaac.net/the-climate-paradox/:contentReference\[oaicite:10\]\[index=10\]](https://blog.iaac.net/the-climate-paradox/:contentReference[oaicite:10][index=10]).

These developments have sparked local protests and underscored the irony of hosting a climate summit at the expense of an already threatened ecosystem.

This paradox highlights the need for credible, coordinated action—not only to deliver meaningful outcomes from COP30 but also to enhance the legitimacy of multilateral, international platforms. If addressed transparently and proactively, these tensions could serve as a catalyst for reform. COP30 holds the potential to become a turning point: a forum where rhetoric gives way to enforceable commitments, funding for conservation is expanded, and global action is better aligned with the needs and priorities of frontline communities. Ensuring the legitimacy of the summit demands that these contradictions are openly acknowledged and meaningfully addressed both in the lead-up to, during and after the conference.

Truly effective transnational forest governance must address power asymmetries, ensure the participation of Indigenous peoples, and recognize the political economy driving forest loss. **Fragmented and voluntary international initiatives are insufficient without binding commitments and robust accountability mechanisms •**

About the project...

This policy brief is part of the project 'Planetary Health: Challenges and Opportunities in the Northern Bolivian Amazon,' which aims to promote access to health, environmental justice, and sustainable socio-economic opportunities in the Bolivian Amazon through the Planetary Health framework, with a particular focus on the needs and rights of women. This brief is informed by research, stakeholder engagement, and fieldwork conducted as part of this initiative.

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