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## The role of Indigenous peoples in protecting forests: a case study of the Brazilian Amazon

**SUMMARY** The article aimed to assess the role of Indigenous peoples in conserving natural resources. It focused on the Amazon, a region inhabited by more than 2 million Indigenous people and highly vulnerable to human pressure due to its mineral and timber wealth. In light of the threats to the ecological balance of this biome caused by economic exploitation, the article sought to verify the hypothesis that the full protection of natural heritage and effective climate policies are impossible without the involvement of Indigenous peoples. The discussion began by identifying the ecosystem services provided by the Amazon to humans and other living organisms. Two research questions were posed: (1) What environmentally relevant rights are guaranteed to Indigenous peoples under the Brazilian legal system? and (2) What actions do Indigenous peoples take to protect natural resources? The questions were addressed through institutional-legal analysis and case studies.

**KEYWORDS** Indigenous people, deforestation, climate change, the Amazon, Brazil

### Introduction

Following World War II, around 1950, a period known as the “Great Acceleration” (Steffen et al., 2011) began, marked by rapid population growth and an accompanying surge in production and consumption, driven by accelerated technological development. This shift led to disruptions in the stability of local ecosystems, eventually impacting the global ecosystem. In just fifty years, humanity experienced profound changes in conditions that had remained relatively stable for the preceding ten thousand years. Given the increasing human

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pressure on the environment, this article aims to assess the role of Indigenous populations in the protection of natural resources, using the Amazon as a case study. This region, located in northern South America between the Andes and the Atlantic Ocean, represents the largest continuous area of tropical rainforests and rivers in the world, while also being rich in mineral resources such as oil, natural gas, gold, diamonds, bauxite, iron ore, tin, copper, manganese, chromium, zinc, lead, nickel, tungsten, and thorium. In addition to rainforests, southern Amazonia contains vast areas of transitional vegetation between forests and savannas (known as *cerradão*), while the central, southern, and eastern parts feature natural savannas (*cerrados*) (Encyclopedia PWN).

In the 1950s, the deliberate colonization of the Amazon began, accompanied by rapid population influx and subsequent changes in land and water resource use, particularly deforestation, road construction, and dam building for hydroelectric energy. Between the 1960s and 1980s, numerous roads were built through the Amazon (e.g., during “Operation Amazonia” a military dictatorship plan aimed at integrating the Amazon with the rest of Brazil, over 16,000 km of roads were constructed in just seven years, including Brasília–Belém, Trans-Amazonian Highway, and Cuiabá–Pôrto Velho). Immigrants from northeastern, southeastern, and southern Brazil settled along these roads, while settlers from the overpopulated Andes arrived in western Amazonia, initiating a growing anthropogenic pressure (Dias, 2019). Approximately 95% of all deforestation occurs within a 5.5-kilometer strip on either side of newly constructed roads (Barber et al., 2014).

State-supported colonization efforts have contributed to deforestation and the conversion of forested areas for agriculture and cattle ranching, particularly in Brazil, as well as deforestation related to oil extraction and other resource exploitation. Approximately 17% of the Amazon rainforest has been cleared, with an additional 17% of the ecosystem degraded due to selective logging and the use of timber for fuel and firewood (Nobre, Arieira & Nascimento, 2023). Over 15% of the entire Amazon is under concessions for oil extraction, significantly impacting the environment and potentially paving the way for further economic exploitation (Vergara et al., 2022). In light of the ecological threats posed by economic activities in the Amazon, this article seeks to examine the hypothesis that effective conservation of the region’s natural heritage and climate policy cannot be achieved without the involvement of Indigenous populations.

The Amazon biome, defined as a region primarily covered by dense tropical rainforests, interspersed with various other types of vegetation (such as savannas,

floodplain forests, grasslands, and wetlands), as well as unique freshwater ecosystems, spans approximately 6.7 million km<sup>2</sup>. It extends across eight countries (in order of their share of its area): Brazil (60.1%), Peru (11.8%), Colombia (7.3%), Bolivia (6.6%), Venezuela (5.9%), Guyana (3.2%), Suriname (2.1%), Ecuador (1.8%), and the overseas department of French Guiana (1.2%) (Maretti et al., 2014, pp. 16–17). The Amazon is home to 47 million people, of whom more than 2 million are Indigenous, representing over 500 different groups (World Wide Fund for Nature). Of the 2.4 million km<sup>2</sup> of Indigenous territories within the Amazon rainforest, approximately 1 million km<sup>2</sup> remain unrecognized. It is estimated that around 20% of this area is seriously threatened by pressure from oil extraction, infrastructure projects, or large-scale agro-industrial exploitation (Climate Alliance). Since the largest portion of the Amazon biome, and consequently the largest group of Indigenous people, is located in Brazil, this article focuses on this part of the region. According to the 2022 census, Brazil is home to 266 Indigenous peoples, accounting for approximately 0.83% of the country's total population (nearly 1.7 million people) (Beldi de Alcântara, 2024). The discussion begins by outlining the region's significance for humans and other living organisms. The article then addresses two research questions: (1) What environmental protection rights are guaranteed to Indigenous populations under Brazil's legal system? and (2) What actions are Indigenous populations taking to protect natural resources? The article uses institutional-legal analysis and case studies to address these questions.

## Ecosystem services of the Amazon

Ecosystem services, also referred to as environmental functions, are defined as the condition and processes through which natural ecosystems, and the species that make them up, sustain and fulfill human life (Daily, 1997, p. 3). According to the report published as part of the Millennium Ecosystem Assessment (2005),<sup>2</sup> four categories of services are distinguished:

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<sup>2</sup> The Millennium Ecosystem Assessment is an initiative launched by UN Secretary-General Kofi Annan in 2001, with the goal of evaluating the impact of ecosystem changes on human well-being and providing a scientific foundation for actions needed to enhance the protection and sustainable use of environmental resources. More than 1,360 experts from across the globe contributed to this assessment. For further details, visit the Millennium Ecosystem Assessment website: <http://millenniumassessment.org/en/About.html#1> [accessed: 14.05.2024].

1. Provisioning services, which involve nature supplying various products, such as food, water, and medicinal substances.

The Amazon provides food not only in the form of plant products (e.g., avocados, Brazil nuts, cocoa, bananas, guava fruits, and açai berries)<sup>3</sup> but also around 511,000 tons of fish annually, accounting for 4.26% of the global freshwater catch (Food and Agriculture Organization, 2020, p. 58). The Amazon River basin is the largest in the world, sustained by the planet's most extensive freshwater system in terms of both length and volume, containing 12–20% of the Earth's freshwater (excluding water stored in ice caps, glaciers, or permanent snow). It is important to note that Brazilian Amazonia ranks among the world's leading regions in tropical timber production, following Indonesia, India, and Vietnam. It is estimated that in 2021 and 2022, Brazil produced around 29.2 million m<sup>3</sup> of tropical timber, with most of this resource coming from the states of Pará, Amazonas, and Mato Grosso (International Tropical Timber Organization, 2023). The timber industry drives the local economy and plays a crucial role in promoting formal employment in the Amazon region.

The flora of the rainforests represents a potential genetic bank, with resources that can be used, for instance, in medicine. Many substances tested for their potential to combat cancer originate from plants and trees in the rainforests. Among the substances used in medicine is tubocurarine, derived from the roots of *Chondrodendron tomentosum*, which was used by Indigenous people in the Orinoco and Amazon basins to poison arrows. In the early 1940s, tubocurarine was introduced as a general anesthetic, blocking neuromuscular transmission, paving the way for other muscle relaxants used in modern medical procedures (Encyclopedia Britannica). Before the introduction of muscle relaxants, anesthetists had to use larger doses of substances such as ether, which caused deeper and riskier states of anesthesia.

2. Regulating services, which refer to the benefits derived from the regulatory functions of natural systems.

The Amazon rainforest is a key component of the global carbon cycle, acting as a carbon sink that absorbs carbon dioxide from the atmosphere, helping mitigate climate change. The Amazon forests sequester between 0.5 and

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<sup>3</sup> For more information about products and ingredients derived from Amazonian forests, see: World Wide Fund for Nature, *Ten Products and Ingredients that Come from Tropical Forests*. Retrieved from: <https://www.wwf.org.uk/updates/10-products-come-tropical-forests> [accessed: 14.05.2024].

2.9 Gt of carbon annually (Laurance, 1998), while global anthropogenic carbon emissions in 2022 totaled 11.1 Gt (40.7 Gt CO<sub>2</sub>) and are estimated to have remained at a similar level in 2023 (Friedlingstein et al., 2023). Research from the 1990s found that Amazonian forests and soils store 10% of the world's biomass carbon (Melillo et al., 1993). The Amazon region holds nearly 38% (86,121 MtC) of the 228,700 MtC stored above ground in the tropical tree vegetation of the Americas, Africa, and Asia. Indigenous territories in the Amazon alone are responsible for storing nearly one-third (32.8%) of the region's terrestrial carbon (28,247 MtC). This amount is larger than the carbon stored in all the forests of the Democratic Republic of Congo (22,128 MtC) or the Republic of Indonesia (18,851 MtC) (Walker et al., 2014). It is important to note that when forests are cut down or burned, the reverse process occurs, as carbon is released into the atmosphere, contributing to the intensification of the greenhouse effect.

The Amazon biome also plays a crucial role in regulating regional climate patterns through the release of water vapor, helping to maintain temperature and humidity levels. The Amazon rainforest recycles 50–75% of its annual rainfall back into the atmosphere through high levels of evapotranspiration (the process by which water is transferred to the atmosphere from the soil, water bodies, and plants) (Macedo & Castello, 2015, p. 22). If this process remains undisturbed by deforestation or degradation, approximately seven trillion tons of water are released into the atmosphere annually (Moutinho, Schwartzman & Santilli, 2005, p. 9). The geographic location and topography of the Amazon make this water crucial for rainfall in key agricultural regions. Moist Amazon air is deflected near the Brazilian state of Acre by the 6-kilometer-high barrier of the Andes, and in the summer, the water vapor is transported southward to a vast quadrilateral area bound by Cuiabá in the north, São Paulo in the east, Buenos Aires in the south, and the Andes in the west. This circulation of water vapor has been called the “flying rivers” of the Amazon. This area accounts for 70% of the continent's GDP (primarily due to agriculture), which would be significantly drier without the influence of the Amazon (Nobre, 2014, pp. 18–19). Through this air flow, billions of tons of water vapor released from the forested areas bring rain to distant regions of the continent. The Amazon rainforest is the primary source of most of the rainfall in South America. By regulating water flow through gradual storage and release, the Amazon helps prevent floods during the rainy season and ensures a stable water supply during dry periods.

Other important regulating services, especially for agriculture, include creating habitats for pollinators and preventing soil erosion. In terms of human

health, its impact on disease incidence is significant. For example, studies conducted in the Peruvian Amazon revealed that the bite rate of *Anopheles darlingi* mosquitoes, the primary malaria vector, was over 278 times higher in deforested areas compared to heavily forested regions (Vittor, 2009).

3. Cultural services, which are intangible benefits people gain from nature, manifesting in spiritual fulfillment, cognitive development, recreation, or aesthetic satisfaction as described by individuals accessing these services.<sup>4</sup>

4. Supporting services, which are essential for delivering other categories of ecosystem services.

These include maintaining natural processes such as soil formation (the Amazon forest recycles nutrients through the decomposition of dead plant and animal matter), nutrient cycling, supporting life cycles (seed dispersal, species interactions, etc.), and preserving biodiversity (genetic, species, and habitat diversity) (Millennium Ecosystem Assessment, 2003). The Amazon biome is one of the most biologically diverse regions in the world. A species inventory conducted in 2002 identified at least 40,000 plant species, 75% of which are endemic. Additionally, scientists have classified 427 mammals, 1,300 birds, 378 reptiles, and 427 amphibians in the Amazon (Da Silva, Rylands & da Fonseca, 2005). It is estimated that the Amazon hosts 10% of all known species on Earth (Maretti et al., 2014, p. 7), though a significant portion of these species remains undiscovered.

## Indigenous rights in Brazil's legal system

The Constitution of the Federative Republic of Brazil recognizes the original rights of Indigenous populations to the lands they have traditionally occupied, including the right to inhabit and utilize natural resources, breaking with the previously dominant tradition of assimilation. "Lands traditionally occupied by Indigenous peoples are designated for their permanent possession, and they have the exclusive right to the riches of the soil, rivers, and lakes existing therein"

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<sup>4</sup> For more details on this topic, refer to the publication presenting the results of research on seven cultural ecosystem services, using the Colombian Amazon as a case study: Angarita-Baéz, J.A., Pérez-Miñana, E., Beltrán Vargas, J.E. et al. (2017). Assessing and mapping cultural ecosystem services at community level in the Colombian Amazon. *International Journal of Biodiversity Science, Ecosystem Services & Management*, 13(1), 280–296. DOI: <https://doi.org/10.1080/21513732.2017.1345981>

(*Constituição da República Federativa do Brasil*, 1988, art. 231, sec. 2). These traditionally occupied lands are defined as “lands permanently inhabited by [Indigenous people], used for their productive activities, essential for the preservation of environmental resources necessary for their well-being, and necessary for their physical and cultural reproduction, according to their ways, customs, and traditions” (*ibid.*, art. 231, sec. 1). The Constitution obligates the central authorities to demarcate, protect, and ensure respect for Indigenous property rights. Furthermore, it stipulates that “water resources, including energy potential, may be exploited, and mineral resources on Indigenous lands may be explored and extracted only with the approval of the National Congress, after consulting the affected communities, and a share in the results of such extraction must be assured to them in accordance with the law” (*ibid.*, art. 231, sec. 3). Lands within Indigenous reserves are permanently held by Indigenous tribes, though they do not have the right to lease or sell the land (*ibid.*, art. 231, sec. 4). Of particular importance is the provision that prohibits the removal of Indigenous groups from their lands, “except in cases of a referendum by the National Congress, in the event of a disaster or epidemic that poses a threat to their population, or in the interest of national sovereignty, following a decision by the National Congress, with the guarantee that in any case, the return will be immediate once the threat ceases” (*ibid.*, art. 231, sec. 5).

The process of demarcating Indigenous lands is overseen by the National Foundation for Indigenous Peoples (*Fundação Nacional dos Povos Indígenas*), which currently operates under the Ministry of Indigenous Peoples (*Ministério dos Povos Indígenas*).<sup>5</sup> It is worth noting that this ministry was established for the first time in Brazil’s history in January 2023, following the presidential election victory of Luiz Inácio Lula da Silva, who had pledged during his campaign to reverse the policies of his predecessor, Jair Bolsonaro. During his administration, Bolsonaro focused on economic development in the Amazon, implementing legal changes that weakened environmental protection policies and

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<sup>5</sup> The name has been in use since January 2023 as a result of a legal act issued by President Luiz Inácio Lula da Silva (Provisional Measure No. 1.154 of January 1, 2023 [*Medida Provisória nº 1.154 de 01 de Janeiro de 2023. Estabelece a organização básica dos órgãos da Presidência da República e dos Ministérios*]). The body was originally established under the name National Indian Foundation (Portuguese: *Fundação Nacional do Índio*, FUNAI) in 1967 [*Lei nº 5.371 de 05 de Dezembro de 1967. Autoriza a instituição da “Fundação Nacional do Índio” e dá outras providências*]) during the military dictatorship (1964–1985) to promote political and economic expansion into the interior of the country, particularly in the Amazon region. FUNAI was initially subordinate to the Ministry of the Interior and later to the Ministry of Justice.

institutions, as well as safeguards for Indigenous lands (see Gonçalves & Cafrune, 2023), leading to a rise in invasions and illegal exploitation of natural resources on protected Indigenous territories.

The Ministry of Indigenous Peoples is led by Sonia Bone de Sousa Silva Santos,<sup>6</sup> also known as Sonia Guajajara, from the Guajajara/Tentehar people. Her efforts to defend the rights of Indigenous peoples, their territories, and socio-environmental issues have earned her international recognition, and *Time* magazine named her one of the 100 most influential people in the world in 2022 (Boulos, 2022). As of November 2023, the National Foundation for Indigenous Peoples' records showed 782 Indigenous territories (i.e., traditionally occupied lands and Indigenous reserves, which are areas transferred by third parties, purchased, or expropriated by the federal authorities for permanent possession by Indigenous people) at various stages of the demarcation process, accounting for approximately 13.82% of Brazil's territory and spread across all biomes, especially within legal Amazonia. A total of 486 areas had regulated status (*Fundação Nacional dos Povos Indígenas*, 2023), and six of them were legally recognized by President Lula da Silva in April 2023. These were the first territories successfully recognized by the state since 2016 (Boadle, 2023).

Despite the special status granted to Indigenous territories, many tribes face violence, attempts to seize their lands, and the exploitation of resources located within their territories. The Indigenous Missionary Council (*Conselho Indigenista Missionário*, CIMI), a Christian organization defending the rights of Brazil's Indigenous inhabitants, recorded 309 cases of violations in 2022 concerning the constitutionally guaranteed exclusive use of Indigenous territories by native populations. Documented incidents include illegal logging on 74 Indigenous lands, unlawful hunting and/or fishing on 45, and illegal extraction of timber, sand, chestnuts, and other natural resources on another 65 Indigenous territories. Among the most affected communities were the Karipuna people in Rondônia

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<sup>6</sup> Sonia Guajajara was born in Araribóia, in the state of Maranhão, northeastern Brazil. Her parents were illiterate, and at the age of 10, she had to leave her home to attend school. In 2018, she was selected as the vice-presidential candidate for the Socialism and Liberty Party (*Partido Socialismo e Liberdade*), becoming the first Indigenous person to run for this office. In the 2023 parliamentary elections, she became the first Indigenous woman elected as a federal deputy for the state of São Paulo. Subsequently, she made history again by becoming the first Indigenous woman to hold a ministerial position in Brazil's government. For more information on Sonia Guajajara, see: Netto, A. (29.09.2023). Brazil's first-ever minister for Indigenous peoples: 'It is time for the world to look at our way of life'. *The Guardian*. Retrieved from: <https://www.theguardian.com/global-development/2023/sep/29/brazils-first-ever-minister-for-indigenous-peoples-it-is-time-for-the-world-to-look-at-our-way-of-life> [accessed: 9.06.2024].



(12 documented cases of invasion, illegal resource exploitation, and damage to cultural heritage), the Yanomami people in Roraima, and the Munduruku people in Pará (10 violations each), the Guarani Mbya people in Rio de Janeiro, Santa Catarina, and São Paulo (9 incidents), and the Mura people in Amazonas (7 illegal activities on Indigenous lands) (*Conselho Indigenista Missionário*, 2023, pp. 78–83). The next section of this article presents a case study of the Karipuna tribe, illustrating the critical role Indigenous inhabitants play in the sustainable use of natural resources.

## **Actions of Indigenous peoples in Brazil to protect the environment and its resources**

The Karipuna people, residing along the banks of the Jacy-Paraná River in north-western Brazil, in the state of Rondônia, have faced environmental degradation on their territory for decades. The Karipuna first made direct contact with outsiders in 1976, when their population was on the verge of extinction. Representatives from the National Indian Foundation (FUNAI), accompanied by a Japanese film crew, reached the village as part of a government mission to locate and assimilate isolated tribes. As a result of this encounter, the Karipuna population collapsed due to introduced infectious diseases such as pneumonia and influenza. Another factor that had already negatively affected the tribe's population was the conflict arising from infrastructure projects. Between the 1970s and 1980s, the tribe's population plummeted from about 200 to just eight individuals (*All Eyes on the Amazon*, 2021). In the 1970s, the Karipuna territory was opened to loggers and rubber producers, who have since attempted to take over the tribe's land. Farmers and cattle ranchers also sought to seize the land by clearing forests for crops and grazing. Although in 1998 the Brazilian government demarcated over 153,000 hectares as Karipuna Indigenous Territory (*Terras Indigenas no Brasil* – Indigenous Land Database), just a year later, settlers arrived in the forest, a few kilometers west of the protected lands, to farm and raise cattle. The settlement was named União Bandeirantes, in honor of the former Brazilian gold prospectors who invaded Indigenous lands. As the settlement grew, settlers encroached further into Karipuna territory, primarily seeking timber and, over time, land for cattle ranching.

At the beginning of the 21st century, Brazil began international efforts to combat deforestation. These efforts included attempts by authorities to evict settlers, and when that failed, the Brazilian Institute of Environment and Renewable

Natural Resources (IBAMA)<sup>7</sup> fined nearly all the farmers in *União Bandeirantes*. While these actions initially reduced deforestation, it began to rise again when institutional protections weakened, and Brazil's economy entered a recession in 2014 (Sandy, 2019).

Deforestation and land grabbing on Karipuna lands escalated from 2016 onwards, coinciding with the construction of a FUNAI Indigenous Territory Surveillance Post (*Posto Indígena de Vigilância*, PIV) on Karipuna lands. Built 12 kilometers from the village of Panorama, this post was part of an environmental compensation project by Santo Antônio Energia, the company building the Santo Antônio hydroelectric dam on the Madeira River in Porto Velho. Unfortunately, after just a few months, inspectors abandoned the post due to depleted operational funds, and FUNAI did not extend the funding.

From 2017, Karipuna leaders began filing reports with the Federal Prosecutor's Office (*Ministério Público Federal*, MPF) regarding invasions and illegal activities on their Indigenous lands (*All Eyes on the Amazon*, 2021). As a result, in September 2017, the Federal Prosecutor's Office issued recommendations ordering FUNAI to create an emergency action plan and provide protection for the Karipuna people and their territory within 10 business days. However, no actions were taken (*Conselho Indigenista Missionário*, 2018a). In February 2018, the abandoned FUNAI post was set on fire by invaders, intensifying fears for their safety among the tribe members (Dantas & Tito, 2019).

In the face of their inability to physically defend their lands from degradation, resource theft, and land grabbing, the Karipuna, now numbering around 60 people, sought help from national and international organizations. In June 2018, Karipuna leaders, along with members of Greenpeace and the Indigenous Missionary Council (CIMI), conducted an aerial survey of their Indigenous territory to identify deforestation and fire sites. They detected illegal road construction providing access to their land and found clearings with large amounts of timber ready for transport. Additional aerial surveys in February and July 2019 uncovered further road expansions used for transporting illegally harvested timber. The aerial monitoring was supplemented with satellite data, including

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<sup>7</sup> The main tasks of the institute established in 1989 include issuing environmental permits and licenses for the use of natural resources, along with supervision and monitoring, as well as exercising police powers in the field of environmental protection. For more information about the environmental protection agency, see the institution's website: <https://www.gov.br/ibama/pt-br/acao-a-informacao/institucional/sobre-o-ibama#historico> [accessed: 11.06.2024].

information from systems like Sentinel-2B<sup>8</sup> and data provided by Brazilian deforestation monitoring systems, such as the Real-Time Deforestation Detection System (*Sistema de Detecção de Desmatamento em Tempo Real*, DETER).<sup>9</sup> Based on the gathered data, Greenpeace analysts concluded that at least 7,640 hectares of forest had been degraded through illegal exploitation between 2015 and 2018 (*All Eyes on the Amazon*, 2021). Deforestation peaked in 2017–2018, surpassing 1,500 hectares, placing the Karipuna Indigenous Territory among the most deforested areas in Brazil (Angelo, 2020). The systematic data collection provided Brazilian authorities with precise information about illegal activities occurring on Indigenous lands.

To pressure federal and state authorities to protect Indigenous rights and raise public awareness about the violations occurring on Karipuna territory, representatives of the tribe, supported by NGOs, have undertaken numerous actions at the local (e.g., demonstrations in the state capital, Porto Velho), national (such as a meeting with then-Minister of Justice Torquato Jardim in March 2018), and international levels. One of the key international actions was Adriano Karipuna's speech in New York in April 2018 during the 17th session of the United Nations Permanent Forum on Indigenous Issues (UNPFII), which focused on the theme *Indigenous Peoples' Collective Rights to Lands, Territories, and Resources* (United Nations, 2018). The Karipuna representative appealed to the international community for the protection of his people, stating, "Since 2015, non-Indigenous people have been invading our land, and this invasion has significantly increased over the past two years under President Temer's administration. Our land is being invaded, allocated, and sold to people who illegally take possession of it and cut down our forests to plant pastures for cattle. [...] In addition to extensive environmental damage, there is a serious and immediate risk of attack on our land by invaders" (*Conselho Indigenista Missionário*, 2018b). In his statement, he accused the Brazilian government of failing to protect the territory and called for concrete action.

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<sup>8</sup> Sentinel-2B is a satellite operated by the European Space Agency (ESA) and is the second in the Sentinel-2 series. This satellite provides high-resolution optical imagery of Earth's surface every five days, capturing areas such as agricultural fields, forests, and land-use changes. For more details, visit the European Space Agency website: <https://esoc.esa.int/content/sentinel-2b> [accessed: 12.06.2024].

<sup>9</sup> DETER is a tool developed by Brazil's National Institute for Space Research (Portuguese: *Instituto Nacional de Pesquisas Espaciais*, INPE) for monitoring and controlling deforestation. Operational since 2004, it uses spatial resolution data of 250 meters from instruments onboard the U.S.-owned Terra and Aqua satellites. For more information about the monitoring system, including its limitations, visit INPE's website: [http://www.inpe.br/amazonia1/en/uses\\_applications.php](http://www.inpe.br/amazonia1/en/uses_applications.php) [accessed: 12.06.2024].

The combination of international pressure, information campaigns, protests covered by the media, and formal complaints filed with state authorities led to a series of federal actions aimed at protecting the Karipuna people and halting environmental destruction on their land. The first operation, codenamed *Kuraringa*, was conducted in September 2018 by the Federal Prosecutor's Office and the Federal Police, supported by FUNAI and the Environmental Military Police (*Polícia Militar Ambiental*). The operation revealed that farms on the edge of Karipuna territory were being used to store machinery for illegal logging, and farmers not involved in criminal activities were being intimidated by loggers into cooperating with them (Tudo Rondônia, 2019). In June 2019, eight federal and state institutions, including the Brazilian Army, the Environmental Military Police of Rondônia, and FUNAI inspectors, carried out an operation named *SOS Karipuna*. Drones were used to identify deforestation points and heavy vehicles inside the forest, and patrols searched for land grabbers' camps. Farmers were arrested, bridges and other constructions built by settlers were destroyed, and tons of illegally harvested timber from the protected area were confiscated (Moura, 2019). The operation resulted in 15 arrest warrants, 34 search and seizure warrants, and the confiscation of assets worth over 46 million Brazilian reais. The charges included theft, trespassing on federal land, illegal logging, money laundering, and forming and participating in a criminal organization (*Ministério Público Federal em Rondônia*, 2019). These coordinated efforts by multiple state institutions reduced environmental degradation on Karipuna territory – illegal vegetation clearing decreased by 49% between August 2019 and July 2020 compared to the same period in the previous year, totaling 580 hectares (Angelo, 2020).

As this analysis demonstrates, the Karipuna people have repeatedly managed to defend their territory from illegal deforestation and resource depletion, but these valuable lands remain under threat. According to data collected by the Indigenous Missionary Council, there has been a renewed escalation of invasions on Karipuna territory, this time by gold prospectors and drug traffickers (*Conselho Indigenista Missionário*, 2023, p. 15). In 2022, the final year of President Jair Bolsonaro's administration, which sought to legalize mineral extraction and logging on Indigenous lands, the sense of impunity was so great that invaders destroyed a bridge providing access to the Karipuna village. Loggers, hunters, and land grabbers (particularly farmers and cattle ranchers) also built bridges to access the tribe's land from nearby towns to facilitate illegal resource extraction. Following police intervention, these bridges were removed, but tribal

leaders were threatened in writing, and Indigenous residents, as well as state government workers who repaired the road leading to the village, were harassed (op. cit., p. 18 and 77). Despite these challenges, the Karipuna tribe continues to fight against environmental destruction on their territory.

## Conclusions

The analysis confirms the hypothesis outlined in the introduction: full protection of natural heritage and an effective climate policy cannot be achieved without the involvement of Indigenous peoples. Establishing clearly defined Indigenous territories by Amazonian governments, while respecting their rights to land and resources, is a critical mechanism for preserving biodiversity and sustainably managing this ecosystem. For Amazonian tribes, the destruction of their forests is tantamount to losing their way of life, as their survival is intricately tied to the health of the forest and its resources. Furthermore, given the vital regulatory ecosystem services provided by the Amazon biome, meaningful climate policy is impossible without its protection. Preserving Indigenous ecological knowledge is also crucial for maintaining the biocultural well-being of these communities.

However, the case of the Karipuna illustrates that Indigenous territories remain vulnerable to development projects and exploitative activities, which risk degrading or shrinking these lands without any compensatory efforts. The evidence suggests that the Amazon biome will continue to face ecological conflicts, as shown by the ongoing protests of Indigenous communities against plans for a railway to transport grain for export from agricultural states to Amazonian ports. In April 2024, during the annual meeting of Brazil's Indigenous peoples in the capital, participants voiced concerns over the potential destruction of tribal lands near the Tapajós River, a major tributary of the Amazon. Kleber Karipuna, leader of Brazil's largest Indigenous organization, *La Articulación de los Pueblos Indígenas de Brasil* (APIB),<sup>10</sup> noted that “the communities had not been consulted on the railway, whose announcement by the government has set off a wave of land grabbing along its planned path” (Boadle, 2024).

The disregard for Indigenous land rights and the rampant exploitation of their territories is further illustrated by the National Foundation for Indigenous Peoples, which reported that, in the first five months of 2024 alone,

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<sup>10</sup> For more information about APIB, visit the organization's official website: <https://apiboficial.org/apib/?lang=es> [accessed: 20.06.2024].

1,000 operations were conducted to combat illegal mining on Yanomami territory, home to 27,100 Indigenous people. These operations led to the confiscation of 38,000 kilograms of cassiterite, 10,848 kilograms of gold, and the arrest of 59 individuals (*Fundação Nacional dos Povos Indígenas*, 2024). The discovery of vast mineral resources and the construction of hydroelectric plants have spurred industrial growth and increased migration, further threatening the region's unique natural environment. While Indigenous peoples are capable of protecting this environment, their efforts require substantial support from government authorities.

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## Rola ludności rdzennej w ochronie lasów: studium przypadku brazylijskiej Amazonii

**STRESZCZENIE** Za cel artykułu obrano ocenę roli ludności rdzennych w ochronie zasobów naturalnych. Regionem szczególnie narażonym na antropopresję, przede wszystkim ze względu na bogactwo surowców mineralnych i drewna, a zamieszkałym przez ponad 2 miliony rdzennych plemion, jest Amazonia. W obliczu zagrożeń dla równowagi ekologicznej tego biomu, związanych z eksploatacją gospodarczą, w artykule postanowiono zweryfikować hipotezę, że pełna ochrona naturalnego dziedzictwa oraz efektywna polityka klimatyczna nie są możliwe bez zaangażowania rdzennej ludności. Rozważania rozpoczęto od wskazania usług ekosystemowych Amazonii dla człowieka i innych żywych organizmów. Następnie postawiono dwa pytania badawcze: (1) Jakie prawa istotne z punktu widzenia ochrony środowiska zagwarantowano ludności rdzennej w systemie prawnym Brazylii? oraz (2) Jakie działania podejmuje rdzenna ludność w celu ochrony zasobów przyrodniczych? Próbę odpowiedzi na wskazane pytania podjęto przy wykorzystaniu metody analizy instytucjonalno-prawnej oraz analizy przypadków.

**SŁOWA KLUCZOWE** ludność rdzenna, wylesienie, zmiana klimatu, Amazonia, Brazylia

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