



# Frogs, coalitions, and mining: Transformative insights for planetary health and earth system law from Ecuador's struggle to enforce Nature's rights

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## ABSTRACT

Pachamama, Mother Earth, faces a mass extinction threat. A radical transformation in human systems is essential, guided by equity and justice at local and global scales. This transformation must reconfigure the World-System's power structures, impacting the ecosphere (ecological functions, biodiversity, and resource regimes) and the ethnosphere (ontological, epistemological, and legal pluralism). Together, these shape the Pluriverse—a planet of many worlds. The status quo is unsustainable. Effective solutions must prioritize a just transition that integrates the pluriverse. Alternatives from the so-called Global South offer valuable tools for this shift, such as the Rights of Nature, which views nature as a rights-bearing entity, not merely an object of regulation. The Llurimagua case—a dispute over a mining concession in Ecuador's cloud forest—illustrates this approach, providing a unique opportunity to rethink Earth System Governance and address the Anthropocene Gap (i.e., disconnect with Earth System Law), crucial for tackling planetary health challenges.

## 1. Introduction

Mother Earth—*Pachamama* in the Andean Indigenous cosmovision, the planetary being encompassing all manifestations of existence, including the mineral and ancestral worlds (Gallegos-Riofrío et al., 2022a)—faces imminent mass extinction risk (Ceballos et al., 2017). This planetary health crisis, unprecedented for humanity, also reveals underlying power dynamics (Friel et al., 2022). A socio-ecological struggle with global implications is unfolding in Ecuador's Intag Valley, where local communities resist mining activities to protect their land, health, and livelihoods, along with safeguarding unique species, including frogs, that nowadays have become symbols of their cause.

Located in Imbabura Province, within the western foothills of the Ecuadorian Andes, the Intag Valley's mountainous terrain, ranging from

600 to 4,000 m above sea level, fosters diverse microclimates and habitats (Freile et al., 2020). This territory, buffer area of the Cotacachi-Cayapas Ecological Reserve and the Biosphere Reserve Chocó Andino, spans over 200,000 ha and is renowned for its exceptional biodiversity, high endemism, and lush cloud forests (e.g., Guayasamin et al., 2021; Kuecker, 2007) (Image 1).

The Intag Valley is home to several communities, Peñaherrera, Plaza Gutiérrez, Cuellaje, Vacas Galindo, García Moreno, and Apuela—the largest settlements. Smaller villages engaged in traditional farming and environmental protection include Junín, Chalguyacu Alto, Cerro Pelado, Barcelona, La Armenia, Chalguyacu Bajo, La Magnolia, San Francisco de Villaflores, Cuaravi, and Chinipamba. Junín, home to approximately 40 households, is the only community located within the Llurimagua concession area—formally designated as the Advanced

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Exploration Phase of Metal Mining Concession (code: 403001) since November 7, 2011 (Plan V, 2023). 'Llurimagua' has been a local reference for the mining operation. Chalguyacu Alto, Cerro Pelado, and Barcelona fall within the direct area of influence of the concession (Walter et al., 2016).

The concession title designated 4956 ha for mining. However, on November 26, 2012, the Ministry of Non-Renewable Natural Resources rectified the Llurimagua Concession title, as part of the granted area overlapped with the Intag Valley's Protected Forest of Chontal and two private properties enrolled in the *Socio Bosque* program (governmental financial compensation initiative incentivize landowners to conserve forests). Following this revision, the concession area was adjusted to 4839 ha, which the Ministry described as 'free of protected areas and/or forests' (Entrix, 2018).

The past 30 years, the Intag Valley has been a focal point of activism. Communities, in coalition with scientists, international figures, and national and international organizations, have opposed mining projects that threaten deforestation, soil and water pollution, food insecurity, loss of biodiversity and local cultures (Avci and Fernández-Salvador, 2016; Guayasamin et al., 2021; Acosta & Zorilla, 2022). To date, sustained, coalesced efforts have successfully blocked three large mining projects (Los Cedros Reserve, 2020; Pothier and Salomonovitch, 2015; Walter et al., 2016), including one in partnership with CODELCO, the world's third-largest copper producer (Pistilli, 2021). In 2015, the Ecuadorian State allocated 51 % of its shares to ENAMI EP, the National Mining Company, and 49 % to CODELCO. By 2020, the government moved to sell its shares to international investors (Plan V, 2023).

The Llurimagua case is pivotal in advancing Nature's rights, with two frog species and the Junín community serving as plaintiffs. It exposed environmental impact studies' failure to account for the protection of a rediscovered species previously thought extinct and a new species. In 2023, a Specialized Constitutional Court ruled a violation of Nature's rights (Trial No. 10332202100937). It revoked the environmental license, halting CODELCO's mega-mining project in Llurimagua (Kimbrough, 2023). However, the Ecuadorian government now pretends to concede Llurimagua to Hanrine (Intag Santuario de Vida, 2024)—a company with a controversial record of alleged environmental

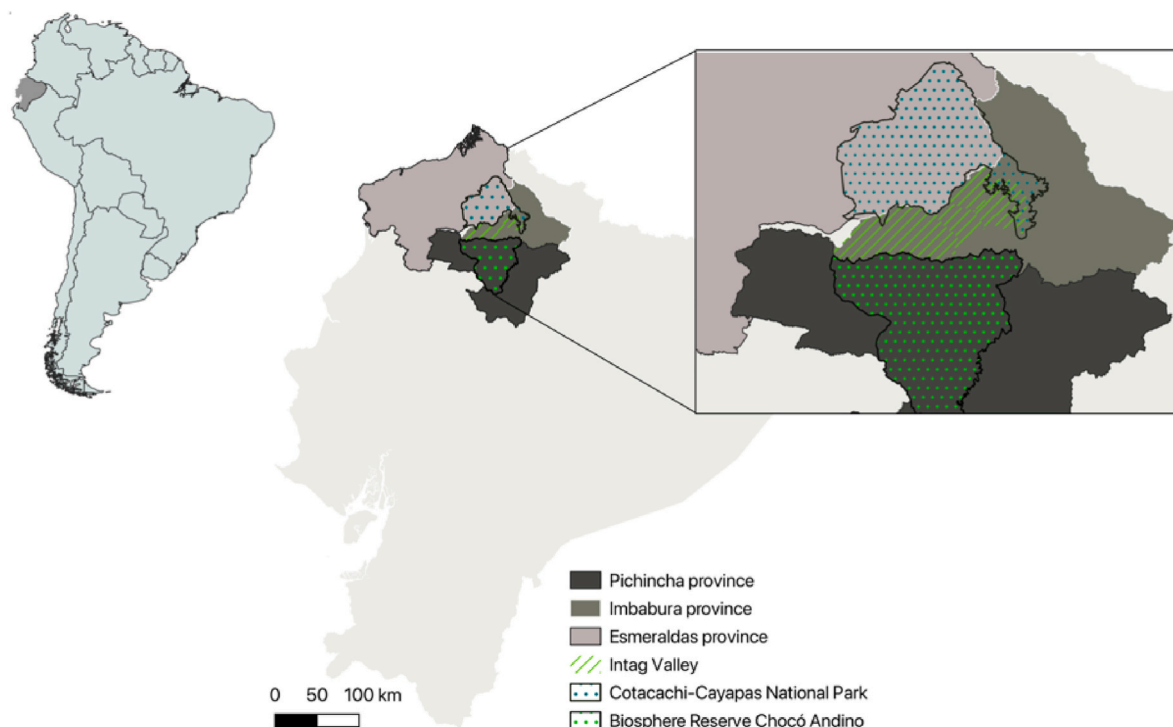
ethical and human rights violations (Environmental Defense Fund, 2019; Human Rights Watch, 2020)—heightening concerns. A critical issue remains: State must to enforce a complete mining ban in the area.

This article fosters a dialogue on global power dynamics, justice, and planetary health by analyzing the Rights of Nature's application in the Llurimagua case, drawing on Wallerstein's World-System framework. It fosters the pluriverse, moving beyond the 'North-South' dichotomy (Escobar, 2019). Our contribution addresses two implications. First, it examines how power-sharing among local communities and their allies—a coalition of local, national, and international actors—can counteract transnational economic interests and their clients, including the Ecuadorian State. Our team—Ecuadorian and U.S. academics, Ecuadorian lawyers, an NGO biologist, and a Nature advocacy network representative—argues that the Llurimagua case is crucial for advancing Earth system governance's legal dimensions, i.e., Earth system law, a research and praxis field key for the regulatory frameworks that addresses Anthropocene challenges (Kotzé and Kim, 2019).

Second, it emphasizing jurisprudence in the interplay between the ecosphere and the ethnosphere—the cultural fabric intertwined with ecological processes and cycles (Davis, 2009). We define planetary health as the interdependent ecosphere-ethnosphere relationship, shaping both human and ecosystem health (Gallegos-Riofrío et al., 2022b), as well as a transdisciplinary field and global movement (Schuftan et al., 2014; Whitmee et al., 2015). By linking planetary health transformative reforms in Earth system law—guided by a pluriversal perspective (e.g., Demaria et al., 2023; Escobar, 2020; Gallegos-Riofrío et al., 2022c) and exemplified by the Llurimagua case and other Rights of Nature rulings—we offer a pathway to advance planetary health equity, i.e., the just and sustainable enjoyment of good health and well-being within a thriving ecosystem (Frank et al., 2024; Friel et al., 2022). Furthermore, this pathway has clear pragmatic implications for bridging Earth system law and Earth system governance, which Kotzé and Kim (2019) describe as the Anthropocene Gap.

## 2. Justice in current World-System?

The North-South dichotomy a widely recognized geopolitical



**Image 1.** Map of Intag Valley, located between the Cotacachi-Cayapas and the Chocó Andino.

concept, oversimplifies the intricate realities of our interrelated world (Escobar, 2019). This binary framing obscures deeper power dynamics best analyzed through World-System Theory, which, despite its limitations, remains relevant for understanding the global sociopolitical order sustained by the exploitation of non-renewable resources like oil and minerals. Within this framework, wealthier nations, the Core, drive resource extraction, exploiting less affluent regions, the Periphery, while Semi-periphery countries occupy a middle ground, simultaneously contributing to and being subjected to exploitation (Wallerstein, 1999). Global policies prioritize the interests of the Core (Chase-Dunn and Grimes, 1995; Reifer, 2004), perpetuating inequality and undermining peripheral regions' pursuit of economic and environmental sustainability.

Core, Semi-periphery, and Periphery, as conceptual categories in World-System, capture systemic power imbalances in global structures. The Periphery disproportionately bears the externalities of this exploitation, enduring severe ecological and social harm (Smith, 2008). However, this resource extraction have not lifted resource-rich nations to the level of Core nations, the primary consumers of these resources (Wolf, 2010).

Robinson (2011) highlights how globalization, driven by transnational corporative forces Core-based mining companies, exploits peripheral regions and reinforces Core-Periphery dynamics. Neighboring Ecuador, for instance, 18 % of Peru's national territory is allocated to mining concessions dominated by transnational corporations from Core nations, extracting gold, copper, and silver for global markets while causing environmental degradation, water scarcity, and displacement in local and Indigenous communities (IWGIA, 2024). Hence, the North-South is not merely geographic but a construct shaped by mechanisms of exploitation that bind resource-extracting nations in the Core to the subordinated regions of the Periphery—a legacy of power asymmetries.

The World-System illuminates the broad patterns of dependency between nations. Still, it has been critiqued for its deterministic nature, often neglecting the agency of local actors in reshaping global systems (Chase-Dunn, 1997). Also, the dynamics of exploitation are not confined to global relations; they are reproduced within Core nations as well. In the interior of these nations, elites act as a Core, consolidating power through various mechanisms and maintaining structures that secure their privileged status (e.g., Gamsu et al., 2024). Additionally, its emphasis on broad structural categories can overlook the nuanced and intersecting identities and struggles within and across regions, particularly in relation to identity and environmental justice. For example, Quijano (2000) argues that the World-System focuses more on economic structures while underestimating the legacy of military expansion and conquest, shaping the cultural, social, and epistemic dimensions of global inequality—the coloniality of power.

In light of the limitations of World-System Theory, it is key to recognize its merit as a dynamic framework with long-term economic cycles—e.g., Kondratieff waves lasting 50 to 70 years—shifting the balance of power (Robinson, 2011). China's \$16 billion investment in overseas mining (2018–2020), particularly in South America's lithium triangle—Argentina, Bolivia, and Chile, which hold 56 % of global lithium resources (BBC News, 2024)—signals its emergence as a rising power within the World-System framework. Investments such as \$1.4 billion in Ecuador's Mirador copper mine and \$30 billion in Latin America's oil sector (2005–2017) further challenge the dominance of modern Core nations (Adler and Ryan, 2022), revealing the potential for global dynamics to be reshaped.

From a critical perspective, following Quijano's coloniality of power, the World-System reinforces not only the Core's coercive and technological power (Chase-Dunn and Grimes, 1995) but also its symbolic power (Bourdieu, 1991)—the hegemonic control over knowledge that, through globalization, critically codifies our understanding of the planet. This control influences perceptions of nature, both its instrumental and intrinsic value while perpetuating the divide between

human and non-human nature (Gallegos-Riofrio et al., 2022c). Moreover, global corporate culture—driven by consumerism, individualism, and competition—adapts to regional 'geocultures' (Robinson, 2011), reinforcing the Core's symbolic power and the hegemonic control over knowledge that shapes Earth system governance. The premise that the World-System is a centuries-old accumulation system endures, particularly when viewed through a 700-year historical lens (Brian, 2023). This global injustice could give way to new forms of coexistence—an Earth system grounded in planetary limits and Escobar's (2019) politics of solidarity.

Considering *Pachamama's* health state—where human activities driven by the current World-System have surpassed the safe operational limits defined by the EAT-Lancet Commission (Willett et al., 2019)—we cannot continue with “business as usual.” Legal disputes contesting state and corporate interests can serve as counterhegemonic movements (Robinson, 2011). Unseen forces, in the form of local resistance and the mobilization of civil coalitions rooted in this resistance, have the potential to challenge the World-System status quo and creating opportunities to reshape global governance in a way that procure planetary health.

The Rights of Nature, arising from local agency in a peripheral country, is a notable response with radical transformative potential (Chapron et al., 2019). The 2008 Constitution of Ecuador marked a paradigm shift by recognizing Nature (purposely capitalized here and elsewhere) as a subject of rights (e.g., the right to maintain life cycles and restore damages), reflecting a broader ethical evolution that expands the premise of dignity beyond humans to encompass all life, regardless of its utility to humans (Cárdenas and Meza, 2023; Jones, 2021). Countries' recognition, like Ecuador, challenges exploitation by positioning non-human nature and ecosystems as legal subjects, offering a counterbalance to entrenched power dynamics.

### 3. Biodiversity hotspot clashing with mining concessions

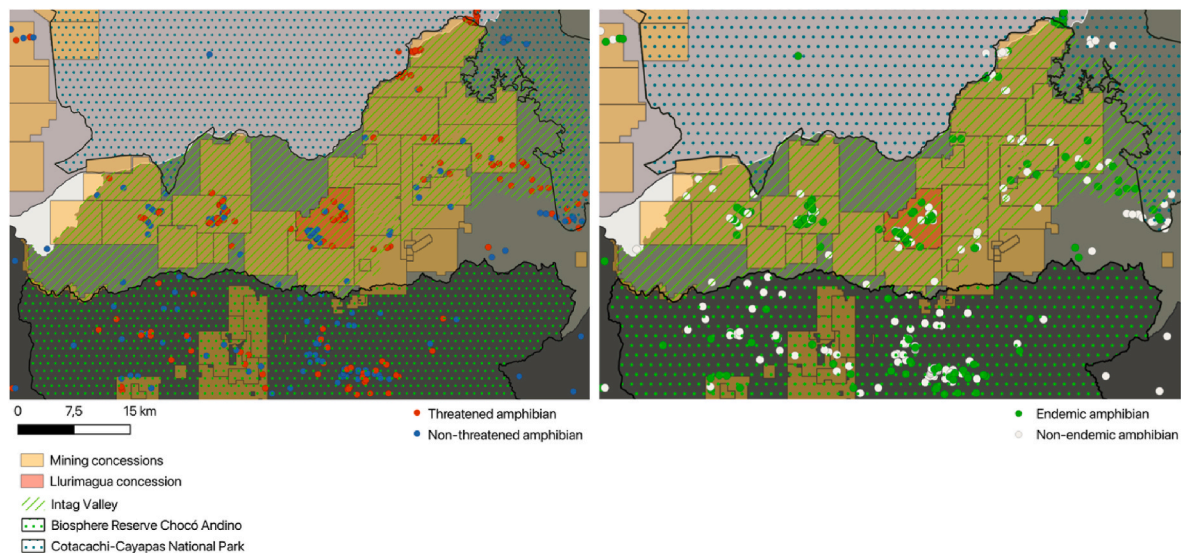
Ecuador ranks ninth among the world's megadiverse countries, with an impressive species diversity (Butler, 2016). The country hosts approximately 16,500–20,000 vascular plant species (Ulloa-Ulloa and Jørgensen, 2004), 465 mammal species (Brito et al., 2023), and 690 amphibian species (Frost, 2024). This includes significant levels of endemism, with 4500 plant, 60 mammal, and 319 amphibian species unique to the region. Ecuador's amphibian diversity is particularly notable, with approximately 2.3 species per 1000 square kilometers—17 times higher than Brazil, 11 times higher than Mexico, five times higher than Peru, and three times higher than Colombia (Coloma and Duellman, 2025).

While the Amazonian region is often recognized for its biodiversity, the Andean region of Ecuador is home to around 60 % of the country's amphibian species. However, this critical area is heavily impacted by mining concessions (Image 2). These concessions overlap with remnants of Andean tropical forests and protected areas, including private and community lands designated for conservation, such as Los Cedros Biological Reserve (Guayasamin et al., 2021). Approximately 20 % of land in protected forests is leased for mining, and around 43 % of these protected forests are affected by mining concessions (Peck et al., 2024).

In Ecuador, the primary mechanism for preventing mining activities in highly biodiverse areas is designation by the National System of Protected Areas (NSPA). However, many mining areas are situated in NSPA buffer zones and in or adjacent to Community Reserves, Protected Forests, and other local protection categories designated for conservation and/or sustainable use that are not considered part of the NSPA. This exclusion is paradoxical because the primary criterion for NSPA inclusion is the absence of overlap with mining concessions. Consequently, biologically essential areas cannot receive protection if there is an economic interest in mining or other extractive activities.

Several authors have issued severe warnings about the impact on unique species in the areas of mining concessions. Mining operations in





**Image 2.** Map - Overlap protected areas, amphibian species and mining concessions  
Based on 2024 Data from Jambatu Center for Amphibian Research and Conservation.

**Table 1**  
Landmark cases on the rights of nature in Ecuador.

Case	Trial No.	Resolution Year	Description	Implications
Piatua Case	16281201900422	2019	Environmental license suspended for inadequate impact study, failing to protect endangered species, and violating Indigenous consultation. Partial compliance was observed.	Highlights the need for comprehensive environmental studies and respect for Indigenous consultation.
Mecheros Case	21201202000170	2021	Nine Indigenous girls sued the state over health risks from gas flaring and oil exploitation, linking human rights, health, and the Rights of Nature.	Reinforces Nature’s rights and emphasizes the need for environmental restoration and state compliance.
Los Cedros Case	1149-19-JP/20	2021	The Constitutional Court ruled on the lack of consultation and violation of Nature’s rights in the Río Magdalena mining concession. The State was found lacking in its effort to protect Nature due to scientific uncertainty. The environmental license was suspended, but mechanisms for non-repetition and protection of Los Cedros forest are not fully complied.	Establishes legal precedent for protecting Nature, urging active conservation and measures to avoid repetition.
Mangrove Case	22-18-IN	2021	The case challenged the Organic Environmental Code’s treatment of mangroves. The court ruled to ban all activities except essential infrastructure and affirm the role of communities and scientific experts in representing Nature in court decisions.	Strengthens mangrove protection and underscores the role of local agency and science in judicial decisions.
Estrellita Case	253-20-JH	2022	Involved the death of a monkey, Estrellita, in custody. The court ruled that her rights to freedom and connection to her ecosystem were violated and held the Ministry of Environment responsible.	Highlights the right not to be extinct and the protection of individual species, emphasizing the obligation to safeguard their dignity and survival.
Llurimagua Case	10332202100937	2023	Challenged failure to protect two frog species in environmental studies. The environmental license was revoked, but company activity remains unaddressed.	It stresses the importance of species protection in environmental studies and calls for strict enforcement.

Source: Ecuadorian Coordinator of Organizations for the Defense of Nature and the Environment (CEDENMA)

the Andean region have great potential for irreversible damage to endemic and critically endangered species, ecological functions, and ecosystem services (Barba et al., 2020; Guayasamin et al., 2021; Peck et al., 2024; Roy et al., 2018). Additionally, the loss of biodiversity extends beyond the number of species to other dimensions, such as genomic, proteomic, chemical, morphological, ecological, and behavioral diversity, as well as traditional knowledge, aesthetic beauty, biomedical potential, and economic value (Coloma and Duellman, 2025).

Civil resistance in Intag is rooted both in the community’s right to free-prior informed consent about extractive activities on their territories and, since the 2008 Constitution, more strongly, in the Rights of Nature (Guayasamin et al., 2021; Walter et al., 2016). The Cedros Case (No. 1149-19-JP/20) is emblematic as it represents a Constitutional Court ruling in 2021, binding nationwide (Guayasamin et al., 2021).

This resistance is aligned with international legal frameworks, such as the ILO’s Indigenous and Tribal Peoples Convention No. 169 of 1989, which Ecuador ratified. The Convention’s central principles—consultation, participation, and free, prior, and informed consent—are vital for protecting the rights of Indigenous communities and rural territories from adverse effects of extractive activities. These principles are enshrined in other international instruments, like the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), which Ecuador endorsed in 2007. While the Llurimagua case primarily involves rural communities, these legal frameworks have played a crucial role in several instances in Ecuador, where Indigenous communities have been at the forefront of promoting the Rights of Nature (see Piatua Case in Table 1).

A 1995 resolution (No. 057) declared 6400 ha of the Los Cedros property in García Moreno parish (Cotacachi canton in Imbabura

province, in the northern highlands of Ecuador) as a Protected Forest. This resolution permits scientific research and tourism while prohibiting activities threatening the environment's integrity (Barba et al., 2020; Constitutional Court of Ecuador, <http://doc.corteconstitucional.gob.ec/>).

In 2009, the Ecuadorian government launched an extractivist revenue plan using the slogan “responsible mining” (Dosh and Kligerman, 2009). As one of the results, in 2017, 68 % of the Los Cedros conservation area was given in concession for gold and copper mining activities to the Canadian mining company Cornerstone Capital Resources in partnership with ENAMI EP, the Ecuadorian state mining company (Los Cedros Reserve, 2020). In response, in June 2019, communities near Los Cedros, along with Ecuadorian and international scientists and advocates, issued and received a Writ of Protection (WoP) (*Acción de Protección*) in the Provincial Court of Imbabura (Basantes, 2020; Guayasamin et al., 2021). The WoP ruling revoked the mining permits, but the government appealed the decision, escalating the case to the Constitutional Court's highest level.

Los Cedros case addressed the lack of environmental consultation and the violation of the precautionary principle during the initial exploration phase of the mining concession named Río Magdalena (Guayasamin et al., 2021). In December 2021, in a landmark ruling, the Constitutional Court determined that plans to mine an area of importance for the conservation of biodiversity in Ecuador are unconstitutional and that the State had not sufficiently protected Nature's rights, citing the principle of scientific uncertainty (Barba et al., 2020). The Court subsequently suspended the environmental license. However, mechanisms for non-repetition and active protection of cases in favor of the Rights of Nature have not been fully implemented.

In the Llorimagua case, in particular, the Specialized Civil, Commercial, Labor, Family, Child, Adolescent, and Juvenile Offenders Chamber of the Provincial Court of Imbabura issued its ruling in 2023 and resolved to (i) declare that there has been a violation of rights related to the protection of Nature and environmental consultation in the communities affected by the mining project; (ii) revoke the environmental license and suspend all mining activities until the ENAMI EP complies with all the required mechanisms and guidelines for environmental consultation, and submits a new environmental impact study and management plan for the advanced exploration phase of metal mining concession 403001 (i.e., Llorimagua).

In theory, Environmental Impact Assessments (EIAs) should mitigate or avoid impacts on these vital ecosystems. However, these assessments frequently fail to account for critical and threatened species. For example, two EIAs conducted by CODELCO, the mining company that holds the most recent concession, only reported 10 (Entrix, 2014; Entrix, 2018) of the 21 (known at the time of the trail) threatened amphibians present in Junin, omitting key species such as the longnose harlequin and a new species of rocket frog (Freile et al., 2020). This oversight highlights the inadequacies of current EIAs in addressing biodiversity concerns. Moreover, according to Barba et al., (2020), areas declared as Protected Forests like Los Cedros, are meant to conserve biodiversity and prohibit activities harmful to the environment. Nevertheless, mining concessions persist despite these legal protections, undermining collective rights and conservation goals (Barba et al., 2020).

The conflict between conservation efforts on fragile ecosystems and economic interests around the exploitation of metals in the Intag Valley is evident, particularly in areas that are part of the Tropical Andes Hotspot (like Los Cedros and the Llorimagua mining concession), the wealthiest and most diverse region of the planet (Yáñez-Muñoz et al., 2024). Los Cedros harbors 500 tree species in its southeastern portion and a cloud forest with at least 242 species at risk of extinction according to the Ecuador Red List (149 according to the IUCN Red List) (Guayasamin et al., 2021). Junin and its surroundings, impacted by the Llorimagua concession, is home to the last known population of the longnose harlequin frog (*Atelopus longirostris*), considered extinct until very recently (Tapia et al., 2017), a new rare species of rocket frog

(*Ectopoglossus* sp. “*resistencia*”), and 20 other threatened amphibian species (Freile et al., 2020; Centro Jambatu, data provided by A. Terán-Valdez, unpublished) (Image 3).

Amphibians are crucial ecological indicators due to their heightened sensitivity to environmental pollutants and toxins (Hopkins, 2007). They occupy significant roles within ecological food webs as predators and prey. Amphibians consume insects and invertebrates while serving as prey for birds and reptiles (Cortéz-Gómez et al., 2015; West, 2018). Their abundance and diversity are vital indicators of ecological health (Hopkins, 2007; Cortéz-Gómez et al., 2015; West, 2018). Frogs are also valuable for educational purposes and inspire joy and wonder among children.

The newly discovered critically endangered resistance rocket frog (Image 3) has become a symbol of hope amidst struggle, drawing global attention, including activist Leonardo DiCaprio: “The people chose the species’ official name—*Rana Cohete Resistencia de Intag* (Intag’s Resistance Rocket Frog), representing the fight of local communities” (DiCaprio, 2022). This species embodies Intag residents’ courage and tireless efforts to defend nature and their traditional livelihoods. Llorimagua is distinguished by the involvement of amphibians, typically non-charismatic species, in a pivotal legal dispute. Community-led resistance against mining activities, exemplified by initiatives such as organic coffee production and ecotourism, is crucial. These efforts aim to offer alternative livelihoods while preserving the ecological integrity of the valley.

However, a more recent and particularly contentious event is a new agreement for mining operation granted to Hanrine Mining Company (a subsidiary of Hancock Prospecting PTY LTD) around the Llorimagua concession (Image 2: ‘Mining concessions’). The Environmental Defense Fund (2019), Human Rights Watch (2020), and The Guardian (2021) reported conflicts between Hanrine’s mining operations and Indigenous rights, while Global Witness (2022) raised concerns about corruption and environmental mismanagement linked to the company Mining operations in Llorimagua would disregard constitutional protections and legal resolutions aimed at conserving biodiversity and safeguarding the community’s health and wellbeing. This situation underscores the broader issue discussed in this contribution: power distribution in the World-System, where economic interests often overshadow protections for local communities and vital ecosystems.

#### 4. Ethnosphere: Andean contributions to the pluriverse

*Terra Mater* for the ancient Romans, *Madre Tierra* in Spanish, *Anu* or *Danu* for the Celtic, *Bhumi Devi* for the Hindus, *Asase Yaa* for the Akan, *Ina Maka* for the Lakota, *Gaia* (γᾱῖα) for the Greeks—who inspired the idea of Earth as a self-regulating, complex system that maintains the conditions for life, i.e., the ecosphere/biosphere (Lovelock and Margulis, 1974)—are among many voices and cultural traditions for Mother Earth. In general, she is a supreme being, a feminine, creative cosmic entity, Earth personified, even land and soil (Gallegos-Riofrío et al., 2022a).

All these different ethos underline a profound relationship that connects systems of knowledge with the balance, homeostasis, of Mother Earth and all her children. Ontological and epistemological alternatives, such as Indigenous Natural or First Law (Redvers et al., 2020). In the Andes, the cosmovision, at the heart of the ontological system, and the Ancestral Wisdom, connected to knowledge and technologies, hold enormous potential to confront the ecological and climate crisis (Carrasco-Torrontegui et al., 2021; Gallegos-Riofrío et al., 2022a).

In Latin America’s cultural roots and relational scholarly, nature is integral to the cognitive and cultural matrix; human beings are seen as part of nature, and life is understood as process and interrelationships (Gallegos-Riofrío et al., 2022c). Notably, Indigenous communities have been at the forefront, advocating for the recognition of Nature’s rights at a constitutional level (Akchurin, 2015; Guzmán, 2019; Peña, 2016). Relational ontologies and epistemologies innately give rise to cultural norms and customary institutions founded on an ethics of care for the





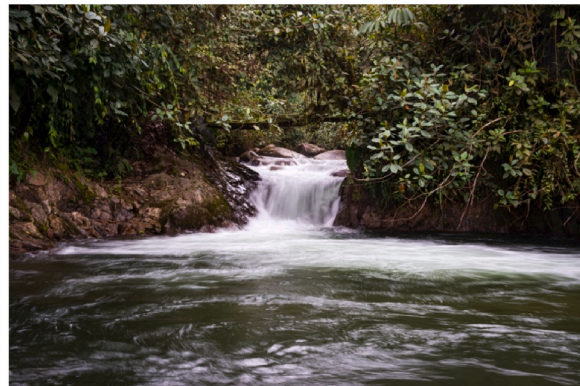
*Atelopus longirostris*  
Photos by Diego Acosta



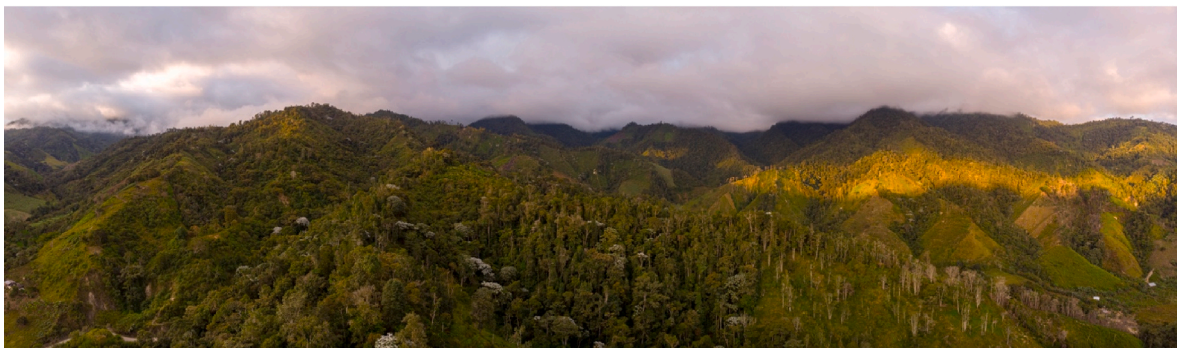
*Ectopoglossus* sp. “resistencia”



Forest



Waterfall



Intag Landscape

Photos (Forest, Waterfall and Landscape) by Gustavo Miño

**Image 3.** Frogs Arlequin, Rocket, landscape. Forest and Waterfall by Gustavo Pazmiño. Intag Landscape by Morley Read.

community and our planet, which we belong to and call Mother Nature, *Pachamama* (e.g., Carrasco-Torrontegui, 2025; Gallegos-Riofrío et al., 2021a). This cognitive matrix in the Ecuadorian case led to institutional hybridization, ethnopolitics (e.g., Fernández-Salvador, 2018), and relational laws originating in social mobilization, activism, and Indigenous discourses. The recognition of Nature (capitalized) as a subject of rights includes acknowledging its dignity—its inherent worth and right to respect simply by existing—dignity being the foundation of human rights (Habermas, 2010). This is reflected in the Preamble of Ecuador’s 2008 Constitution:

RECOGNIZING our age-old roots, wrought by women and men from various peoples,

CELEBRATING nature, the **Pachamama (Mother Earth)**, of which we are a part and which is vital to our existence,

INVOKING the name of God and recognizing our diverse forms of religion and spirituality,

CALLING UPON the wisdom of all the cultures that enrich us as a society,

AS HEIRS to social liberation struggles against all forms of domination and colonialism

And with a profound commitment to the present and the future,

At that moment decided to build

A new form of public coexistence, in diversity and harmony with nature, to achieve a good way of living, the **sumak kawsay** [we prefer the customary term **alli kawsay**];

A society that respects, in all its dimensions, the dignity of individuals and community groups;

The controversial Llurimagua mining case in Ecuador, illustrates the clash between current World-System dynamics and paradigms known as 'civilizational proposals' or 'pluriversal alternatives' (Demaria et al., 2023; Escobar, 2020). The Pluriverse embracing multiple worldviews, cosmovisions, and knowledge systems of knowledge that challenge single dominant Core perspective, the One-World Ontology (Gallegos-Riofrío et al., 2022c). The Andean cosmovision and ancestral wisdom emphasize harmonious coexistence, embodied in the concept of *allí kawsay* (good way of living or good living), and is enshrined in the Rights of Nature (Kothari et al., 2014). In this view, food sovereignty is intrinsically tied to healthy, sustainable food systems and good living, prioritizing planetary health over economic growth and recognizing the vital role of small communities in peripheral countries like Ecuador within the Earth system (Gallegos-Riofrío et al., 2021b).

Article 71 of the 2008 Constitution of Ecuador grants Nature the right to "integral respect for its existence and for the maintenance and regeneration of its life cycles, structure, functions, and evolutionary processes [...]" and also that "all persons, communities, peoples, or nationalities may call upon public authorities to enforce the Rights of Nature." Its conceptualization, regulation, and implementation involve a intercultural and interdisciplinary dialogue (e.g., Guayasamin et al., 2021; Kothari et al., 2014). This right requires engagement among various stakeholders—including collaboration among local communities, inhabitants of affected territories, and representatives from science, academia, conservation NGOs, and other interested parties to create a shared language and coordinate actions to protect Nature.

New forms of coexistence with non-human nature, like the 30-year anti-mining resistance in Intag Valley, are crucial for Earth system law and planetary health. This approach differs from the conventional conservation and sustainability concepts models (Gallegos-Riofrío et al., 2022c; West et al., 2024) and praxis within the World System framework, which often symbolically separates and physically limits or excludes human communities from "protected areas."

The recognition of the Rights of Nature represents a significant Andean contribution to the pluriverse, with profound implications for the sustainability of human societies. It offers a framework to address the intersecting biodiversity loss and ecological degradation on a global scale. The Andean cosmovision's concept of *allí kawsay* codes Nature, *Pachamama*, as a web of radical interdependence (Gallegos-Riofrío et al., 2022c), encompassing rich sociocultural, historical, and material diversities, collectively known as the *ethnosphere*, along with its cognitive and cultural outcomes, which shape the pluriverse (Gallegos-Riofrío et al., 2022b). Fundamentally, *Pachamama* embodies a multidimensional planet of many worlds, integrating *ethnosphere* and *ecosphere*.

## 5. Re-signifying Global Just Transitions through Nature Rights

Climate change, a manifestation of the World-System, drives Core societies toward an accelerated transformation of their energy matrices, fueling an increasing demand for critical minerals needed for this transition (McCauley and Heffron, 2018). The global shift from non-renewable to renewable energy sources (Smith, 2012) presents significant opportunities and substantial risks. Large-scale mining activities in previously untouched areas pose severe environmental threats and have repercussions transcending national borders.

The concept of just transitions, first developed by trade unions and environmental groups in the United States during the 1970s, goes beyond merely creating a sustainable economy (Heffron, 2015). It is a framework designed to protect rights, enhance community wellbeing, promote environmental health while addressing broader social injustices (Heffron and Heffron, 2021). However, to effectively address World-System disparities, the just transition framework must confront justice issues arising from socio-ecological dynamics within and beyond Core nations (Newell and Mulvaney, 2013).

The journey towards a just transition involves a complex interplay of external and internal factors (Scoones et al., 2020). Internal factors,

especially community-led initiatives, are crucial for addressing local challenges and seizing opportunities. They emphasize the importance of local, instilling a sense of empowerment and motivation. On the other hand, external factors, including significant political and economic forces and social movements, play a pivotal role in driving systemic change. Recognizing the Rights of Nature in Ecuador is particularly important to the just transition framework as it exemplifies how the confluence of external and internal factors can drive systemic transformation.

Rooted in Indigenous wisdom and supported by academic and social movements, Ecuador's 2008 constitutional recognition of Nature's rights reflects the Andean concept of *allí kawsay* (good living). The concept has gained global recognition embraced, including adoption by the U.S. Climate Justice Alliance to emphasize thriving without exploiting others. In this sense, the framework aims to foster harmony between human activities and Nature, integrating considerations of ecology, gender, and ethnicity (Routledge et al., 2018).

While global recognition of the Rights of Nature faces resistance, the Ecuadorian social movements continue to resist the Ecuadorian government and international mining companies seeking to exploit the country's resources. This ongoing resistance underscores the necessity for a Just Transition Framework that addresses power dynamics in Core and Periphery, reflecting the complexities of a globalized world.

The extensive copper deposits in Llurimagua, projected to become the country's third-largest mine, cater to the demands of affluent nations transitioning to cleaner energy sources (Bridge, 2018). Although this transition aims to balance benefits and mitigate externalities, in reality, the Periphery bears the burden of pollution while the benefits remain unevenly distributed. A more genuine just transition must address power concentration in the Core and ensuring ensuring that resource-rich peripheral country are not further marginalized in Earth's system governance.

The current World-System—governing the Earth system—challenges the implementation of the Rights of Nature, particularly as the Core benefits from extractive practices. A significant example is China's rise as a global power, driving large-scale balsa wood extraction for wind turbine production. This activity threatens Indigenous territories and protected areas in the Amazon, including the Cuyabeno Wildlife Reserve in Ecuador. Ecuador supplies 90 % of the world's balsa wood, with 79 % of exports directed to China between 2019 and 2024 (Entorno, 2024). This dynamic perpetuates economic exploitation, undermining ecological health and social stability, in direct conflict with the *allí kawsay*.

A worldwide recognition of the Rights of Nature requires binding global authority, similar to the Universal Declaration of Human Rights (UN General Assembly, 1948). While international institutions like the United Nations and international coalitions could embed these rights into global frameworks, harmonizing legal systems and overcoming resistance from economic-driven forces remains challenging. The *Escazú Agreement* (2020) stands out as a critical governance tool for advancing environmental and ecological justice. Signed by Ecuador and 22 other Latin American countries, this binding regional treaty emphasizes safeguarding biodiversity and ensuring accountability for violence against defenders. However, despite its entry into force in April 2021, violence persists; 2100 nature defenders were killed globally, and 70 % of these murders occurred in four Latin American countries in 2023 (Global Witness, 2024). Strengthening the Escazú Agreement is crucial for a Global Just Transition through Nature's Rights.

Economically, the challenges are profound. No large-scale extractive models have achieved true sustainability—even those incorporating circular economy principles. This underscores the need for innovative, ethical, and grounded approaches. The *Earth Charter* (2000) offers a pathway for advancing the Rights of Nature by recognizing nature's intrinsic value and advocating for environmental justice. Shaping policy and law fosters more equitable and sustainable global practices.

Overcoming these challenges requires coordinated efforts among nations, global institutions, and local communities. Effective recognition



and implementation of the Rights of Nature will be fostered by design a more just and sustainable relationship between humans and non-human nature.

## 6. Governance for planetary health equity and justice

The planetary boundaries framework evaluates humanity's impact on the Earth system's capacity to sustain life, serving as a stark reminder of the urgent need for action (Lade et al., 2020). However, achieving inclusive—and therefore pluriversal—governance of these boundaries remains a pressing challenge (Pickering and Persson, 2020; Lade, 2024). The Core's influence on the Periphery is a critical factor, degrading the health of Mother Earth and hindering a just transition. For instance, in 2019, 79 % of global metal ore extraction occurred in five of the six most species-rich biomes, with mining volumes in tropical humid and cloud forests doubling since 2000; half of this extraction occurred within 20 km of protected areas (Luckeneder et al., 2021).

Intense extractive operations in biodiversity hotspots, such as mining in the Chocó Andino bioregion (Image 1 and Image 2), embodied by the current struggle of the Intag Valley, pose a severe threat to regional resilience and planetary health. The Chocó Andino, a biodiversity hotspot, has crucial ecosystem functions like water purification, climate regulation, and soil fertility (Bruijnzeel et al., 2011; Requena Suarez et al., 2019). Mining in these areas creates a feedback loop of environmental stressors, including deforestation and pollution, which severely destabilize ecosystems and impair their recovery (Laurance, 2014). The resulting habitat fragmentation isolates species, hinders migration, and significantly declines biodiversity and ecosystem functionality (Avci and Fernández-Salvador, 2016). This degradation exacerbates vulnerability to climatic events and natural disasters, weakening natural and human systems (BenDor et al., 2015). Additionally, the loss of sustainable livelihoods, such as agriculture and ecotourism, due to intense extractive operations like mining erodes social capital and prompts rural depopulation (TEEB, 2010).

The Llurimagua Project in Intag Valley critically compromises biodiversity, ecosystem viability, and public health. The Environmental Impact Study (references as No. 403001) insufficiently addresses public health impacts, including vector-borne diseases, respiratory conditions, and mental health issues. Endemic species like the Intag resistance rocket frog and the long-nosed harlequin frogs (Image 3) would face extinction, endangering the region's genetic heritage (Guayasamin et al., 2021). Heavy metals in soils and water sources accumulate in plants and organic tissues, posing long-term health risks (Machado et al., 2008).

A growing body of research shows how forest conservation is crucial for reducing chronic child malnutrition, protecting human health, and improving, underscoring conservation's potential benefits (Naidoo et al., 2019; Rasolofson et al., 2020). Heavy metal exposure near mining sites is strongly associated with severe health issues, including headaches, liver cirrhosis, kidney failure, and increased cancer risks (Chen et al., 2022), mainly affecting Junin and surrounding communities. Contamination from mining also threatens food safety and soil fertility (Chen et al., 2022; Altamira, 2010). This convergence of ecosystem, human health, and nutrition impacts threatens wellbeing and reduced self-sufficiency in accessing healthy culturally appropriate food for hundreds of Ecuadorians. These cascading consequences underscore the urgent need for sustainable and inclusive governance in biodiversity hotspots.

The planetary boundaries framework underscores the need for coordinated land and ocean governance, including policies to prevent agricultural expansion into natural ecosystems, restore degraded areas, and establish international land-use governance (Willett et al., 2019). However, continuing World-System logic, which describes the global economic and political system perpetuating inequality and exploitation, impacts planetary health, as local, national, and regional processes are intrinsically linked to the Earth system (Whitmee et al., 2015).

Conventional environmental laws often focus on regulating human impacts through permits, limits, and, in the best-case scenarios, restoration. In contrast, the Rights of Nature aim to preserve entire ecosystems holistically—for this reason, two frog species and a human community can act as plaintiffs. This biopolitical approach promotes health across the scale and the whole web of life rather than addressing isolated issues.

Recently, the connection between planetary health and Earth system governance has been explicitly recognized, emphasizing the need for equity (Frank et al., 2024). Building on Frank et al. (2024) and complemented by a pluriversal view (e.g., Gallegos-Riofrío et al., 2021b; WHO's 1999 Declaration on the Health and Survival of the World's Indigenous Peoples), we propose a conceptualization of planetary health equity that extends beyond individual wellbeing. It encompasses the fair and inclusive enjoyment of intergenerational and multidimensional health for ecosystems and living cultures. This includes integrating traditional and local knowledge, addressing structural barriers, ensuring food sovereignty and diverse, healthy diets, and embracing the principle of good coexistence, inspired by the Andean concepts of good living, *alli kawsay* (Gallegos-Riofrío et al., 2022c; Hidalgo-Capitán and Cubillo-Guevara, 2017; Kothari et al., 2014). However, emphasizing justice involves correcting and balancing the unevenly distributed impacts on planetary health exerted by the current World-System.

Ecuador offers a powerful example of inclusive and innovative governance, grounded in territorial regimes like heterarchy—systems of distributed intelligence, reciprocity-based social institutions, and legal pluralism, where customary norms are coordinated with modern legal frameworks—that values the interaction of multiple knowledge systems (Gallegos-Riofrío et al., 2021a). This approach, common in Andean Indigenous communities, fosters equitable collaboration—rather than imposing top-down decisions (i.e. hierarchy). The Ecuadorian constitutional process exemplifies this, with social movements—environmental, Indigenous, and agroecological collectives—playing a critical role in securing the country's recognition of the Rights of Nature. This shift faces tensions as state control clashes with Indigenous autonomy—and recognized in the 2008 Constitution (Gallegos-Anda, 2018).

The August 20, 2023, referendum highlights Ecuadorians' commitment to ecological justice, with 59 % voting to halt oil extraction in Yasuní National Park, a UNESCO Biosphere, and 68 % banning metallic mining in the Chocó Andino bioregion within Quito's Metropolitan District (Mongabay, 2023a, 2023b). Both areas are biodiversity hotspots with rich non-renewable resources.

Ecuador's Constitutional Court has advanced inclusive governance, notably with its 2022 ruling reaffirming the constitutional ban on genetically modified organisms (GMOs) (Agencia Tierra Viva, 2022). The decision overturned a 2017 amendment permitting transgenic seeds for research, marking a significant victory for *Acción Ecológica* (NGO Ecological Action), *Confederación de Nacionalidades Indígenas del Ecuador* (Confederation of Indigenous Nationalities of Ecuador), and other grassroots organizations. Grounded in the Constitution's Article 401, the ruling mandates strict national interest justification for GMOs, reinforcing the country's food sovereignty stance.

Ecuador demonstrates how collective-informed governance can navigate tensions, advance holistic policies, and bridge human and planetary health. Scaling this globally is urgent as health inequities worsen under a fuel-and-mineral-based economy that disproportionately harms Indigenous and rural communities (Anderson et al., 2016; IWGIA, 2024). Addressing this crisis requires dismantling extractivist systems and shifting governance toward equity, accountability, and ecological regeneration over profit (Friel et al., 2022).

## 7. Advancing earth system law

In 2014, the United Nations General Assembly (UNGA) called for regulatory approaches that integrate Earth system science with governance to and promote planetary-level policies and laws and policies for



to effectively managing human behavior (Kotzé and Kim, 2019). The Anthropocene Gap highlights legal shortcomings amid unprecedented human impact, which Kotzé and Kim (2019) address through Earth system law using international environmental law as a key example.

The 1948 Universal Declaration of Human Rights initiated a debate about legal rights for objects versus subjects. For instance, the 1989 Convention on the Rights of the Child marked a shift from viewing children as objects of societal protection to recognizing them as subjects with rights (Vargas, 2018). The human right to a clean, healthy, and sustainable environment was adopted by the UNGA in 2022.

Environmental law emerged from social movements advocating for human rights, peace, and environmental protection after disasters like the Trail Smelter, Love Canal, and Exxon Valdez oil spill, formally codified in the 1967 U.S. National Environmental Policy Act (NEPA) (Barsa and Dana, 2011). NEPA laid the foundation for international law (Brunnée, 2004), also adopted in Latin America (Paez, 1995). Over the past fifty years, international environmental law has shaped global agreements through seven key principles: sovereignty and responsibility, good neighborliness and cooperation, precaution, prevention, the 'polluter pays' principle, common but differentiated responsibility, and sustainable development (Soto, 1996; Tarlock and Dernbach, 2009). These principles frame modern extractivist activities and the interactions among states, corporations, communities, and illicit practices like illegal logging and species smuggling. This legal tradition laid the groundwork for the 1972 UN Conference on the Human Environment and the Sustainable Development Goals 2015–2030 Agenda (Purvis et al., 2019).

However, advancing Earth system law through existing environmental law presents key limitations. Rooted in anthropocentric-ethnocentric legal traditions, environmental law treats non-human nature as an object to be managed rather than a subject with inherent rights. The Anthropocene, depicting a human-dominated planet, reflects this divide and, as Whitmee et al. (2015) note, is linked to escalating planetary health risks. This ontological and epistemological separation of humans from nature may be at the core of the problem. In contrast, Kotzé and Kim (2019) see the Anthropocene as an opportunity to rethink human-nature relationships. The Rights of Nature framework advances Earth system law by recognizing ecosystems' intrinsic rights beyond human utility, promoting a moral evolution toward ecological justice (Cárdenas and Meza, 2023; Jones, 2021).

This article explores the 'Anthropocene Gap' through the Rights of Nature as a pluriversal perspective that transcends environmental law's limits, fostering a more inclusive, dignified, and regenerative human-nature relationship. This shift also aligns with alternatives to the Anthropocene, such as the Ecozoic (Farley et al., 2024), which resonates more closely with Andean *allí kawsay*—harmonious coexistence within Pachamama, recognizing humans as Nature (Gallegos-Riofrío et al., 2022c). It also connects with Escobar's (2019) vision of a globally rooted politics of solidarity, re-envisioning Earth system governance to evolve from the current World-System through local and regional struggles linked to international action and moving beyond environmental law top-down approaches.

The Rights of Nature have inspired legal innovations globally. For example, Bolivia's Mother Earth Law acknowledges the Rights of Nature within its legal framework (Calzadilla and Kotzé, 2018). Similarly, New Zealand has granted legal personhood to the Whanganui River and Te Urewera (Sheehan, 2015). In Canada, legal recognition of the Rights of Nature has been granted in specific cases such as the Grassy Narrows First Nation's land rights (Borrows, 2010), and there are numerous similar cases in Mexico, India, the U.S., Chile, Argentina, and Brazil (e.g., Clark et al., 2019; Gilbert et al., 2023). These advances push the international community toward an eco-relational model that harmonizes the ecosystem and ethnosphere.

Incorporating Nature's Rights into Ecuador's Constitution in 2008 was inspired by Indigenous ancestral wisdom and supported by

academic and social movements—the impact has been global (Arce et al., 2015). Consequently, despite emerging critiques claiming that the Rights of Nature may degrade Indigenous rights, their Indigenous origin and expansion represent a profound emancipatory advance (Guzmán, 2019). Social mobilization by Indigenous groups and activists, as seen in ecological justice causes worldwide (e.g., Schlosberg, 2007), has been crucial in advancing this paradigm shift (Table 1).

The Rights of Nature paradigm, which necessitates an epistemological shift, serves as a disruptive force with profound local, regional, and global implications, challenging the prevailing World-System. Ecuador's pioneering experience demonstrates that integrating diverse worldviews—the dominant Western perspective alongside Indigenous knowledge systems and cosmovision—has fostered a productive dialogue between science and the concept of Nature as core to *allí kawsay* (good living). As seen in rulings like the Mangroves Case, this synthesis has advanced the protection and respect for Nature as a subject of rights. Similarly, in the Llurimagua case, the advocacy coalition led by local communities and associations, Defensa y Conservación Ecológica de Intag (DECOIN), Jambatu Center, Coordinadora Ecuatoriana de Organizaciones para la Defensa de la Naturaleza y el Medio Ambiente (CEDENMA), and The Alliance of Organizations for Human Rights.

The litigation concerning the Rights of Nature aligns with scientific evidence and social movements that advocate for policy and action based on such evidence. The Los Cedros case includes 126 relevant publications on the non-profit website (<https://loscedrosreserve.org>). Both the scientific and practical dimensions are crucial to transcending the limitations and biases of environmental law, enriching the work initiated by the 2018 Task Force on Earth System Law (Kotzé and Kim, 2019).

Ecuador's constitution, through Article 71, grants nature the right to "integral respect for its existence and for the maintenance and regeneration of its life cycles, structure, functions, and evolutionary processes." The concept of *allí kawsay*, a new form of public coexistence, in diversity and harmony with nature, as stated in the preamble, embodies the spirit of Earth system governance. This approach coordinates human actions to address Earth system transformations, emphasizing the roles of institutions and actors in global environmental change to ensure "a 'safe' co-evolution with natural processes" (Biermann, 2007: 328).

Our analysis is that, in the Latin American context, judicial decisions such as those involving the Atrato River, the Colombian Amazon, or Mexican Laguna del Pescador, reveal that judges and lawyers must develop intricate arguments over extended periods to establish nature's status as a legal subject. This process involves constructing a legal framework based on jurisprudence and principles derived from human rights and the rights of Indigenous populations. In Ecuador, recognizing the Rights of Nature simplifies the legal process, allowing for a greater focus on developing, conceptualizing, and understanding this paradigm shift.

The so-called Global South is leading global transformation with its eco-relational approach to sustainability, conservation, and human livelihoods (Gallegos-Riofrío et al., 2022c). As Sir Jonathon Porritt, a prominent UK environmentalist, notes in a media release: "Ecuador was the first nation to include the Rights of Nature in its constitution, and it could now become the first to protect large swathes of biodiversity based on this constitutional innovation, setting an invaluable precedent worldwide" (Rainforest Action Group, 2020).

The constitutional court ruling in the Los Cedros case (Guayasamin et al., 2021) marks a significant step in establishing a legal tradition of critical importance to Ecuador's biomes and beyond. The Guardian (Greenfield, 2021) reported on the case, including insights from Mika Peck, a senior lecturer in biology at the University of Sussex who has conducted research in Los Cedros:

"Policy frameworks that place humans in context as a part of nature, integrated into a system that balances intrinsic rights between legitimate subjects of the law rather than putting humans above or apart from

**Table 2**  
Three dimensions of the Rights of Nature as they relate to Ecuador's legal framework.

Dimension	Definition	Ecuador's Constitutional Approach
<b>Axiological</b>	Redefines the legal system's values by granting Nature intrinsic worth beyond its utility to humans.	The ruling affirms the indivisibility and obligatory protection of Nature's rights, placing them on par with other constitutional rights.
<b>Principal</b>	Acts as a guiding principle to ensure that laws, policies, and rulings respect Nature, positioning it as a cross-cutting axis within the legal system.	It emphasizes that environmental permits cannot override Nature's rights, highlighting the precedence of these principles.
<b>Normative</b>	Recognizes specific rights for Nature, making its protection enforceable and obligating both the state and citizens.	The case demonstrates the practical application of constitutional mechanisms to enforce Nature's rights.

nature, will be necessary to address the serious environmental issues our planet faces. This ruling is as significant for nature as Thomas Paine's Rights of Man was for our species (Greenfield, 2021)".

Building on these concrete examples, the next critical step is to scale the Rights of Nature framework beyond its conceptual foundations and make it actionable. The experiences in Ecuador show that these rights are not theoretical but have been effectively operationalized in legal and advocacy contexts. to advance it and ensure its widespread implementation. Drawing on Ecuador's successes, we explore the legal, institutional, and political foundations needed to effectively recognize and enforce these rights, offering specific recommendations for policy reforms and governance models. The first step toward implementing these rights is their recognition in binding legal instruments. The Ecuadorian Constitution innovatively frames Nature's rights by:

1. Recognizing Nature as a legal subject.
2. Granting comprehensive, open-ended rights, such as:
  - o The right to respect, imposing obligations of care.
  - o The right to maintain vital cycles, requiring health-preserving actions.
  - o The right to restoration, mandating reparations for harm.
3. Affording Nature equal constitutional status, balancing these rights alongside human rights.
4. Providing mechanisms for immediate legal protection, accessible to all.

Viewing constitutions as frameworks that guide and constrain state actions, recognizing Nature as a subject of rights fulfills a threefold dimension: axiological, principal, and normative. Axiological emphasizes Nature's intrinsic value, principal ensures its protection is a guiding legal principle, and normative establishes enforceable standards obligating the state and citizens to uphold these rights. Ecuador's judicial cases have transitioned the debate from the existence of these rights to their scope, offering a vital framework for addressing the global civilizational crisis. The Llorimagua case exemplifies this three-dimensional approach (Table 2).

These recommendations aim to bridge the gap between legal recognition and real-world impact, providing a scalable framework adaptable to local and global contexts. Through this analysis, we hope to contribute to the global discourse on ecological justice, offering a pathway for systemic changes that safeguard the Rights of Nature at every level. Globally, local resistance and innovative legal frameworks, such as those in New Zealand (Whanganui River, Te Urewera), Mexico (Laguna del Pescador), India (glacier protection cases), and several in Ecuador (Table 1), demonstrate the paradigm's transformative potential.

Recommendations and examples prove that integrating Nature's rights into constitutional and legal systems, advancing globally earth system law, inspires not only transformative change but also offers actionable pathways to address planetary health challenges. Effective governance for planetary health requires a commitment to justice and pluriversality, ensuring that ecosystems and marginalized communities are uplifted and capable of challenging the current World-System; in the pluriverse, multiple futures and futures-in-difference are possible (Escobar, 2020). Co-existence requires legal pluralism, such as heterarchical governance of ecological communities that include humans (Gallegos-Riofrío et al., 2021a; Robbins-Schug et al., 2023).

8. Conclusions

Earth system governance integrates the social sciences and humanities to address global environmental change and sustainability in the Anthropocene (Biermann, 2014; Young, 2017), and its connection to planetary health is now well established (Frank et al., 2024; Friel et al., 2022). Yet, it must also confront the structural imbalances of the Core-Periphery dynamic. Major polluters in the wealthy Core must reduce their carbon footprint (IPCC, 2021) without deepening the ecological and social harms in resource-rich peripheral countries like Ecuador's Intag Valley. Extractive activities like mining—reinforced by anthropocentric-ethnocentric legal traditions that separate humans from Nature—undermine ecosystem integrity, public health, and local economies (Jones, 2021).

Addressing these challenges requires harmonizing the ecosphere and ethnosphere, as reflected in resilient biocultural landscapes (Gallegos-Riofrío et al., 2021a,b; Gallegos-Riofrío et al., 2022a) and diverse evosystems (Mastretta-Yanes et al., 2024). Rooted in Indigenous and grassroots movements, the Rights of Nature—especially with regionally binding tools like the Escazú Agreement—offer a legal and ethical foundation for peace, justice, and planetary health. Grounded in dignity and the Andean tradition of *alli kawsay*—harmonious coexistence with *Pachamama* (Gallegos-Riofrío et al., 2022c)—this approach integrates ecological and environmental justice, with potential for a genuine just transition.

Andean contributions to the pluriverse challenge dominant development law, and governance paradigms by centering collective and ecological rights over individual interests (Climate Justice Alliance, 2024). Framing the Anthropocene Gap through a pluriversal lens—via the Rights of Nature, politics of solidarity (Escobar, 2019), and the Planetary Health Equity and Justice framework—enables integrated, cross-scale governance that values diverse knowledge systems. This is essential to ensuring the Rights of Nature endure and actively shape a more just, regenerative, and healthy planet.

CRediT authorship contribution statement

**Carlos Andres Gallegos-Riofrío:** Writing – original draft, Supervision, Project administration, Investigation, Formal analysis, Conceptualization. **Mario A. Moncayo-Altamirano:** Writing – original draft, Conceptualization. **Andrea Terán-Valdez:** Writing – original draft, Visualization, Data curation. **Gustavo Redín-Guerrero:** Writing – original draft, Conceptualization. **Carlos Varela:** Writing – original draft, Conceptualization. **Stephen Posner:** Writing – original draft. **Amaya Carrasco-Torrontegui:** Writing – original draft, Supervision, Conceptualization.

Declaration of generative AI and AI-assisted technologies in the writing process

ChatGPT was used discreetly to check English during preparation, as six authors are non-native speakers. The authors reviewed and edited all content and take full responsibility for the final publication.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this article.

## Data availability

No data was used for the research described in the article.

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