Editorial

In war, one thing is certain: the environment always loses

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The Spanish painter Francisco de Goya (1746–1828) left, among his rich artistic legacy, a series of engravings entitled *Los Desastres de la Guerra* (*The Disasters of War*), in which he portrays, with striking rawness, scenes of human violence during the Napoleonic conflicts. A hidden figure in these images, though no less significant than the human tragedy, is nature itself, which emerges as a casualty in every war. As Michel Serres observes in *Le Contrat Naturel* (*The Natural Contract*) (1990), the environment is an often-overlooked victim of human conflict.

Wars have always existed, and human losses have invariably been immense. However, since the First World War (1914–1918), advances in military technology have increasingly revealed a dual trend: the growing asymmetry in casualties between opposing sides, and the expanding scale of destruction inflicted upon both natural and built environments. From the earliest chemical weapons to the use of missiles and drones, including atomic and fragmentation bombs, the environmental footprint of warfare has intensified alongside its destructive capacity. At the same time, conflicts continue to proliferate, driven by intertwined religious, political, and economic interests.

The current war involving Israel and the United States of America against Iran has drawn attention to several issues already evident during the US military intervention in Venezuelan territory in 2025. Although Israel maintains longstanding political and military rivalries with Iran, the involvement of the United States highlights interests tied to energy resources — more specifically, oil and gas reserves.

Beyond the motivations surrounding access to fuel supplies, the sudden escalation of the conflict and the resulting concerns over restrictions on global oil and gas trade have exposed humanity's persistent dependence on fossil-fuel-intensive energy systems.

This dependence of nations on non-renewable fossil fuels, alongside the vulnerabilities it creates, continues to produce immediate geopolitical and economic repercussions. Beyond financial speculation, the mere prospect of supply disruption has driven prices upward almost instantaneously.

Such dynamics raise a pressing question: why does this vulnerability persist despite decades of recognition regarding the urgency of energy transition? Technological advances have already made the large-scale expansion of renewable energy sources, including solar, wind, biomass, and hydropower, viable. Scientific evidence and international protocols have reinforced the urgency of accelerating this transition. Nevertheless, geopolitical and economic interests prevail, prolonging global dependence on hydrocarbons.

An analysis conducted by Clean Creatives, examined approximately two thousand corporate communication materials (YouTube videos, digital and social media ads, executive speeches, press releases, interviews and television commercials), published between 2020 and 2024 by major oil companies, such as BP, Chevron, ExxonMobil and Shell. The study found that these firms retreated from prior commitments with transition plans and returned to prioritisng fossil fuel production and shareholder returns, while framing mitigation strategies such as carbon capture and storage as justification for continued expansion of extraction activities.

According to the study, this shift was accompanied by a gradual transformation in corporate narrative. They gradually abandoned the discourse adopted in 2021, when they claimed they would assume responsibility and leadership in the energy transition in response to the climate emergency. This shift evolved arguments focused on energy security (2022), followed by claims regarding the need for a diversified energy mix to legitimise continued fossil fuel expansion. To preserve some residual reference to climate concerns, companies mobilised references to emissions reduction and carbon sequestration (2023), before a more explicit reaffirmation of fossil fuel dependence and the necessity of maintaining extraction for economic stability and energy security re-emerged (2O24)[1]. Thus, corporate discourse has been progressively transformed, and environmental concern has receded from both the rhetoric and the practices of oil extraction companies. National governments have similarly reinforced policies aligned with economic priorities and the worldview that underpins them.

Brazil's current efforts to expand oil exploration along the Equatorial Margin of the Amazon confirm this broader context. On its official website, Petrobras justifies the initiative in the following terms:

"We work continuously to meet energy demand, develop production, and expand our horizons. Located in the country's northern region, the Equatorial Margin has significant oil potential and offers numerous opportunities to improve the lives of thousands of Brazilians. It has the potential to generate jobs, increase tax revenues, and contribute to regional and national development."[2]

The immediate economic and social appeal of this argument is evident.

This leads to a further warning: the environmental implications of this renewed trajectory. The Paris Agreement is being quietly undermined, and the environment may pay a severe price. In Brazil, there is a risk of direct damage to coastal and marine ecosystems, including mangrove areas. Continued fossil fuel combustion will intensify greenhouse gas emissions, further exacerbating climate change. In this context, investments in science, technology, and public debate concerning energy transition risk being eclipsed by the imperatives of political and financial rationality.

War merely served as the starting point for this reflection, whose conclusion highlights a planetary crisis that underscores the urgent need to free us from dependence on oil and gas and from the conflicts this dependence engenders. Advancing the transition to renewable energy is therefore not only an environmental imperative but also a strategic necessity for peace and global stability. Regardless of who prevails in any given war, the environment always loses. As a scholarly forum committed to advancing socio-environmental sustainability, *Sustainability in Debate* reaffirms its commitment to promoting critical reflection and evidence-based advocacy in support of the global transition towards renewable energy systems.

In this edition, *Sustainability in Debate* brings together contributions that directly address the structural challenges and contradictions surrounding sustainability transitions, socio-environmental governance, and climate adaptation, issues that the current geopolitical conjuncture makes impossible to ignore.

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Several articles engage directly with the political, territorial, and geopolitical dimensions of the energy transition.

González examines Latin America's strategic yet constrained position in the geopolitics of critical minerals, arguing that the global shift towards renewable energy may be reconfiguring, rather than overcoming, historical centre-periphery dependency relations, thereby limiting the region's prospects for greater autonomy in the emerging geopolitical order. Complementing this macro-structural perspective, Carvalho *et al.* provide a comparative assessment of wind energy policies in Ceará, Brazil, and Galicia, Spain, demonstrating that the expansion of renewable energy infrastructure, while

essential to decarbonisation, may reproduce distributive injustices and territorial conflicts when not accompanied by robust mechanisms of procedural and distributive justice.

A second group of contributions addresses the growing complexity of climate adaptation and socio-environmental vulnerability across diverse territorial contexts. Araújo *et al.* assess the Climate Action Plan of the City of Rio de Janeiro through a public health lens, finding that while the plan addresses several determinants of the Urbanism Favourable to Health framework, significant opportunities remain to strengthen local-level vulnerability assessments. Rahmani *et al.* assess recent trends in water quality indicators in the Paraíba do Sul River basin, demonstrating that climate variability affects water quality and availability is projected to decline, particularly under high-emission scenarios, underscoring the urgency of mitigation and adaptation measures to ensure regional water security. Nascimento and Panceri investigate perceptions of climate change among grape and wine producers across Brazil, showing that although approximately 80% of producers already perceive climatic impacts on productivity and quality, adaptive responses remain limited in both scope and effectiveness.

The issue also explores the socio-economic and institutional drivers of environmental degradation and resource governance. Carvalho *et al.* examine the relationship between macroeconomic variables and deforestation in the Amazon between 2000 and 2023, showing that exchange rates and agricultural profitability are key economic drivers of land-use expansion, and that conservation policies and monitoring mechanisms remain essential counterweights to these pressures. Pariona and Vieira analyse determinants of innovation in aquaculture organisations in the San Martín region of Peru, underscoring the role of technological cooperation and fiscal incentives in fostering a more competitive and resilient sector.

Methodological and epistemological innovations in sustainability research also feature prominently in this edition. Dávalos *et al.* reflect on the application of qualitative research techniques, including participant observation and semi-structured interviews, in socio-environmental studies. The authors use the case of the Jacaré-Curituba settlement in Sergipe to demonstrate how qualitative approaches can capture subjective dimensions that quantitative methods often fail to measure. Messias and Drumond present an ethnobotanical study documenting plant species historically used to dye sisal fibres in a Brazilian artisan community, showing how the reintroduction of natural dyes through participatory workshops can revive traditional knowledge while supporting more sustainable artisanal production. Tarin *et al.* examine the Emergent Ecologies platform, focusing on its Women in Artisanal Fishing section, to argue that platforms integrating social science research, digital media and socio-environmental activism create spaces for the co-production of knowledge and can contribute to climate justice and transformative sustainability action.

Finally, Pereira *et al.* broaden the debate on sustainability governance by analysing FIFA's environmental standards for stadium infrastructure and identifying opportunities to strengthen environmental criteria in global sports governance by incorporating internationally recognised sustainability benchmarks, such as B Corp, GRI, Carbon Trust, and ISO 14001.

Taken together, the contributions in this issue reaffirm that sustainability transitions are neither linear nor inherently just. Whether in the geopolitics of critical minerals, the territorialisation of renewable energy, urban climate adaptation planning, environmental governance, or knowledge co-production, the pathways towards sustainability remain contested, uneven, and deeply political.

We hope you enjoy reading this issue.

The Editors

NOTES

1 | https://climainfo.org.br/2026/03/25/petroliferas-abandonam-discurso-verde-e-reforcam-dependencia-de-petroleo-e-gas/

2| https://petrobras.com.br/quem-somos/novas-fronteiras