

Saving Global Forests from the Changing Climate

Felipe Antônio Nogueira Pinto*

Universidade Federal do Rio Grande do Sul, Av. Paulo Gama, 110 – Bairro Farroupilha, Porto Alegre, RS, 90040-060, Brazil

*: All correspondence should be sent to: Dr. Felipe Antônio Nogueira Pinto

Author's Contact: Dr. Felipe Antônio Nogueira Pinto, PhD, E-mail: felipe.pinto@yahoo.com

DOI: <https://doi.org/10.15354/si.25.op343>

Funding: No funding source declared.

COI: The author declares no competing interest.

AI Declaration: The author affirms that artificial intelligence did not contribute to the process of preparing the work.

The world's forests stand at the frontlines of climate change—both as victims and as vital allies. These ancient ecosystems absorb carbon dioxide, shelter millions of species, and sustain countless human communities. Yet, they are now burning, drying, and disappearing faster than ever under rising temperatures, shifting rainfall, and unrelenting deforestation. Saving global forests requires more than conservation slogans; it demands urgent global cooperation, equitable funding for forest nations, and recognition that forests are not just resources but living systems critical for human survival. Nations must reimagine their economies to value standing trees as much as extracted minerals, and consumers must recognize the true cost of every product that fuels deforestation. The fate of forests is intertwined with our own. To save them from the changing climate is to save the balance of life itself—because without forests, the Earth cannot breathe, and neither can we.

Keywords: Forests; Climate Change; Deforestation; Conservation; Sustainability

Science Insights, November 30, 2025; Vol. 47, No. 5, pp.2025-2029.

© 2025 Insights Publisher. All rights reserved.



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the [Creative Commons Attribution-NonCommercial 4.0 License](https://creativecommons.org/licenses/by-nc/4.0/) which permits non-commercial use, reproduction and distribution of the work without further permission provided the original work is attributed by the Insights Publisher.

THE STORY of our planet's forests is both beautiful and tragic—a tale of growth, resilience, and destruction. Forests are the lungs of the Earth, drawing in carbon dioxide and breathing out oxygen, balancing the atmosphere that allows all life to exist (Forzieri et al., 2022). They hold ancient wisdom, having survived ice ages and volcanic winters, only to now face a threat that is entirely human-made: the changing climate. The survival of global forests is not a distant environmental issue but a moral and existential one (Bolte et al., 2023). If we lose our forests, we lose far more than wood and wildlife—we lose stability, identity, and the very capacity of our

planet to sustain us.

Forests have always been silent witnesses to the rise of civilizations. They have given us food, medicine, shelter, and inspiration. Yet, the relationship between humanity and forests has become increasingly one-sided. From the Amazon to the Congo Basin, from the Siberian taiga to the forests of Borneo, trees are falling at a catastrophic rate (Nitzke & Braunbeck, 2021). Some vanish under chainsaws and bulldozers; others die standing, scorched by heatwaves or drowned by floods. Climate change intensifies every threat—droughts dry the soil, pests multiply in warmer temperatures, and fires rage with terrifying

frequency (Messier et al., 2022). What was once a self-regulating, resilient system is now unraveling, with each lost acre amplifying the planet's instability.

The tragedy is that forests are both victims and saviors in this crisis. They absorb nearly a third of human carbon emissions each year, acting as massive carbon sinks (Pan et al., 2024). But when they burn or degrade, they release that stored carbon back into the atmosphere, turning from allies into accelerators of climate change. This vicious feedback loop—where climate change destroys forests and destroyed forests worsen climate change—defines one of the greatest paradoxes of our time (Anderegg et al., 2022). Humanity has built an economic system that undermines the very natural systems that make it possible to exist.

Saving global forests from the changing climate requires more than replanting trees. It requires rethinking how we live, produce, and consume. Reforestation efforts, while well-intentioned, often fail when treated as quick fixes rather than long-term ecological commitments (Bussotti & Pollastrini, 2025). A forest is not a plantation—it is a complex, interconnected web of life that takes centuries to mature. Planting monocultures of fast-growing species may absorb some carbon, but it does not restore the intricate biodiversity or the cultural and ecological value of a natural forest. Restoration must mean regeneration, not replacement (Brouwer et al., 2024).

One of the greatest challenges in protecting forests lies in economic inequality. Many of the richest forests are in countries that are economically poor. Local communities often depend on logging, agriculture, or mining to survive, even if these activities destroy the environment in the long run (Bhushan et al., 2024). Meanwhile, wealthy nations that benefit from forest products—from timber to palm oil, from coffee to beef—externalize the environmental costs. Climate justice, therefore, is inseparable from forest conservation. If the global community truly wants to save forests, it must support sustainable livelihoods for the people who live within and around them (Fischer et al., 2023). Paying nations and communities to preserve forests, through mechanisms like carbon credits and conservation funding, can be part of the solution—but only if such systems are transparent, fair, and genuinely beneficial to local populations.

Another critical dimension is the recognition of Indigenous peoples as stewards of the forest. Indigenous communities have protected forests for centuries through traditional knowledge and sustainable practices. Studies consistently show that forests managed by Indigenous groups have lower deforestation rates than those under government or corporate control (Tabriz et al., 2021). Yet these communities often face displacement, violence, and marginalization when conservation projects ignore their rights. True forest protection must respect and empower Indigenous sovereignty, ensuring that conservation is not another form of colonialism but a partnership rooted in respect and reciprocity (Nøbrega et al., 2023).

The role of governments and international institutions cannot be overstated. Policies must go beyond symbolic pledges. Too often, global summits end with lofty promises that vanish under the weight of political and economic inertia (Reed et al., 2024). Forest nations must be supported not just in words but in resources—through debt relief, direct funding for conservation

programs, and technological assistance to monitor illegal deforestation (Osborne et al., 2024). Meanwhile, consumer countries must reform their import policies to reject goods linked to forest destruction. Supply chains must become transparent, and corporations must be held accountable for their ecological footprints. Saving forests is not a charitable act; it is a global necessity that demands systemic transformation.

Climate change is reshaping the forests themselves. In the Arctic, warming temperatures allow shrubs to invade tundra, altering carbon dynamics (Messier et al., 2022). In tropical regions, droughts weaken rainforests, making them vulnerable to fires that once would have been rare (Scheller et al., 2012). Even temperate forests, often seen as stable, are changing as tree species migrate northward or uphill in search of cooler climates (González et al., 2010). The shift is not just ecological but existential; we are witnessing ecosystems evolve faster than many species can adapt. Some scientists warn that the Amazon, the largest rainforest on Earth, may be approaching a tipping point—where it could transform into a savanna, unable to sustain its own rainfall (Malhi et al., 2009). If that happens, the consequences would be global, altering weather patterns and releasing vast amounts of carbon.

Technology can aid in monitoring and protecting forests, but it cannot replace them. Satellites now track illegal logging in near real-time, and drones can replant trees faster than humans (Mo et al., 2023). Yet, technology must serve ecology, not the other way around. The most powerful tools in saving forests remain human empathy and collective will. It requires us to look beyond borders and generations, to imagine a future where economic success is measured not by growth alone but by harmony with nature (Obura et al., 2022).

Consumer behavior also holds immense power. Every choice we make—what we eat, what we buy, what we waste—ripples through the world's forests. Reducing meat consumption can lower demand for pastureland in the Amazon. Choosing certified sustainable products can help curb illegal logging. Supporting companies that invest in reforestation can shift market incentives toward sustainability. Individual actions, though small, become powerful when multiplied by millions of conscious choices.

Education plays an equally vital role. The fight for forests begins in classrooms, where future generations learn that trees are more than scenery—they are systems that sustain water cycles, regulate temperatures, and harbor life. Environmental education should not be a luxury subject but a core element of every curriculum. When people understand their dependence on forests, they are less likely to destroy them and more likely to defend them (Fang et al., 2022).

Yet, amid the urgency, there must also be hope. Nature possesses an incredible capacity for recovery when given the chance. Forests can regrow, species can return, and ecosystems can heal. Across the world, rewilding projects are demonstrating that with patience and protection, degraded lands can once again flourish (Brouwer et al., 2024). Communities are restoring mangroves to buffer coastlines, farmers are adopting agroforestry to sustain soil and income, and countries are pledging to expand their protected areas (Mo et al., 2023). These efforts may seem small compared to the scale of destruction, but they remind us

that change is possible.

The question is not whether we can save global forests from the changing climate, but whether we will choose to. Humanity has the knowledge, the technology, and the resources to act—but it must also find the courage. This is a moral test for our species: can we live with restraint, compassion, and foresight? Can we redefine progress to include the well-being of forests, rivers, and all living things? The answer will determine the future not only of nature but of civilization itself.

To save the world's forests is to recognize that they are not separate from us. Every breath we take, every drop of rain, every stable season owes something to a forest somewhere. If

we allow them to vanish, we erase the very conditions that allow life to thrive. But if we protect and restore them, we nurture a living legacy that will outlast us, carrying the memory of balance and the promise of renewal.

In the end, saving global forests from the changing climate is not simply an environmental cause—it is an act of survival and reverence. It is choosing life over convenience, wisdom over greed, and hope over despair. The forests have stood by us for millennia, asking for nothing but the right to exist. Now, as the climate shifts and the world trembles, it is our turn to stand for them. For when the last tree falls, it will not be nature that fails—it will be us. ■

Received: June 10, 2025 | Revised: September 29, 2025 | Accepted: October 22, 2025

References

- Anderegg, W. R. L., Wu, C., Acil, N., Carvalhais, N., Pugh, T. A. M., Sadler, J. P., & Seidl, R. (2022). A climate risk analysis of Earth's forests in the 21st century. *Science*, 377(6610), 1099–1106. DOI: <https://doi.org/10.1126/science.abp9723>
- Bhushan, S., Dincă, I., & Shikha, S. (2024). Evaluating local livelihoods, sustainable forest management, and the potential for ecotourism development in Kaimur Wildlife Sanctuary, India. *Frontiers in Forests and Global Change*, 7, 1491917. DOI: <https://doi.org/10.3389/ffgc.2024.1491917>
- Bolte, A., Mansourian, S., Madsen, P., Derkyi, M., Kleine, M., & Stanturf, J. A. (2023). Forest adaptation and restoration under global change. *Annals of Forest Science*, 80(1), 1. DOI: <https://doi.org/10.1186/s13595-022-01172-6>
- Brouwer, R., Bongers, F., Peña-Claros, M., Zuidema, P. A., Brancalion, P. H. S., Lohbeck, M., Guzmán, A. H., Heinze, A., Guillemot, J., Krämer, K., & Sheil, D. (2024). Forest restoration, biodiversity, and ecosystem services (p. 160). Oxford University Press. DOI: <https://doi.org/10.1093/9780197683958.003.0007>
- Bussotti, F., & Pollastrini, M. (2025). Planting trees as a nature-based solution to mitigate climate change: Opportunities, limits, and trade-offs. *Forests*, 16(5), 810. DOI: <https://doi.org/10.3390/f16050810>
- Fang, W., Hassan, A., & LePage, B. A. (2022). The living environmental education. In *Sustainable Development Goals Series*. Springer International Publishing. DOI: <https://doi.org/10.1007/978-981-19-4234-1>
- Fischer, H. W., Chhatre, A., Duddu, A., Pradhan, N., & Agrawal, A. (2023). Community forest governance and synergies among carbon, biodiversity and livelihoods. *Nature Climate Change*, 13(12), 1340–1347. DOI: <https://doi.org/10.1038/s41558-023-01863-6>
- Forzieri, G., Dakos, V., McDowell, N. G., Alkama, R., & Cescatti, A. (2022). Emerging signals of declining forest resilience under climate change. *Nature*, 608(7923), 534–541. DOI: <https://doi.org/10.1038/s41586-022-04959-9>
- González, P., Neilson, R. P., Lenihan, J. M., & Drapek, R. J. (2010). Global patterns in the vulnerability of ecosystems to vegetation shifts due to climate change. *Global Ecology and Biogeography*, 19(6), 755–768. DOI: <https://doi.org/10.1111/j.1466-8238.2010.00558.x>
- Malhi, Y., Aragão, L. E. O. C., Galbraith, D., Huntingford, C., Fisher, R. A., Zelazowski, P., Sitch, S., McSweeney, C., & Meir, P. (2009). Exploring the likelihood and mechanism of a climate-change-induced dieback of the Amazon rainforest. *Proceedings of the National Academy of Sciences*, 106(49), 20610–20615. DOI: <https://doi.org/10.1073/pnas.0804619106>
- Messier, C., Potvin, C., Muys, B., Brancalion, P. H. S., Chazdon, R. L., Seidl, R., & Bausch, J. (2022). Warning: Natural and managed forests are losing their capacity to mitigate climate change. *The Forestry Chronicle*, 98(1), 2–12. DOI: <https://doi.org/10.5558/ffc2022-007>
- Mo, L., Zohner, C. M., Reich, P. B., Liang, J., de-Miguel, S., Nabuurs, G. J., Renner, S. S., van den Hoogen, J., Araza, A., Herold, M., Mirzagholi, L., Ma, H., Averill, C., Phillips, O. L., Gamarra, J. G. P., Hordijk, I., Routh, D., Abegg, M., Yao, Y. C. A., ... Jagodziński, A. M. (2023). Integrated global assessment of the natural forest carbon potential. *Nature*, 624(7990), 92–100. DOI: <https://doi.org/10.1038/s41586-023-06723-z>
- Nitzke, S., & Braunbeck, H. G. (2021). Arboreal imaginaries: An introduction to the shared cultures of trees and humans. *Green Letters*, 25(4), 341–348. DOI: <https://doi.org/10.1080/14688417.2021.2072633>
- Nóbrega, R., Alencar, P. H. L., Baniwa, B., Buell, M., Chaffe, P. L. B., Correa, D. M. P., Correa, D. M. do S., Domingues, T. F., Fleischmann, A. S., Furgal, C., Giatti, L. L., Kui, S. O. da S. H., Kui, N. I. P. N. H., Jenipapo-Kaninde, J. A., Li, H., Mamede, A. F. M., Moura, J. F., Nehemy, M. F., Pinheiro, R. L. G., ... Stein, S. (2023). Co-developing pathways to protect nature, land, territory, and well-being in Amazonia. *Communications Earth & Environment*, 4(1), 1026. DOI: <https://doi.org/10.1038/s43247-023-01026-7>
- Obura, D., DeClerck, F., Verburg, P. H., Gupta, J., Abrams, J. F., Bai, X., Bunn, S. E., Ebi, K. L., Gifford, L., Gordon, C., Jacobson, L., Lenton, T. M., Liverman, D., Mohamed, A., Prodani, K., Rocha, J., Rockström, J., Sakschewski, B., Stewart-Koster, B., ... Zimm, C. (2022). Achieving a nature- and people-positive future. *One Earth*, 6(2), 105–118. DOI: <https://doi.org/10.1016/j.oneear.2022.11.013>
- Osborne, T., Cifuentes, S., Dev, L., Howard, S., Marchi, E., Withey, L., & da Silva, M. S. R. (2024). Climate justice, forests, and Indigenous Peoples: Toward an alternative to REDD+ for the Amazon. *Climatic Change*, 177(8), 96. DOI: <https://doi.org/10.1007/s10584-024-03774-7>
- Pan, Y., Birdsey, R. A., Phillips, O. L., Houghton, R. A., Fang, J., Kauppi, P. E., Keith, H., Kurz, W. A., Ito, A., Lewis, S. L., Nabuurs, G. J., Shvidenko, A., Hashimoto, S., Lerink, B., Schepaschenko, D., Castanho, A., & Murdiyoso, D. (2024). The enduring world forest carbon sink. *Nature*, 631(8021), 563–570. DOI: <https://doi.org/10.1038/s41586-024-07602-x>
- Reed, G., Alook, A., & McGregor, D. (2024). Decolonizing climate agreements strengthens policy and research for all future generations. *Nature Communications*, 15(1), 4810. DOI: <https://doi.org/10.1038/s41467-024-49143-x>
- Scheller, R. M., Kretschun, A. M., Tuyl, S. V., Clark, K. L., Lucash, M. S., & Hom, J. (2012). Divergent carbon dynamics under climate change in forests with diverse soils, tree species, and land use histories. *Ecosphere*, 3(11), 1–21. DOI: <https://doi.org/10.1890/ES12-00241.1>
- Tabriz, S., Trærup, S. L. M., & Minjauw, F. M. E. (2021). Indigenous Peoples and climate technologies (p. 42). Technical University of Denmark. Available at: <https://local.forskningsportal.dk/local/dki-cqi/ws/cris-link?src=dtu&id=dtu-c82e8e2c-cab3-4e84-a80a-bf3b893>

[ef0ff&ti=Indigenous%20Peoples%20](#) [and%20Climate%20Technologies](#)