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Overlooking vegetation loss outside forests imperils the Brazilian Cerrado and other non-forest biomes

The global emphasis on halting forest loss has failed to recognize the biodiversity and ecosystem services provision of non-forest biomes such as the Brazilian Cerrado. Here, we stress the urgent need to address their destruction, including at the upcoming UN Conference of the Parties (COP28), and for coordinated efforts to protect these non-forest ecosystems amid the climate crisis.

The relentless destruction of non-forest biomes not only refers to the widespread conversion of native vegetation but also to historically neglected biodiversity-rich ecosystems. The Cerrado biome (Brazilian savannah) – a global biodiversity hotspot, with over 4,800 plant and vertebrate endemic species[1] – is the most active frontier of agricultural expansion in Brazil[2]. More than half of the original native Cerrado vegetation has already been lost and, in 2022, the Cerrado experienced the highest conversion rate in 7 years: 1.07 million hectares of natural area was converted[3]. Although DETER (a near-real-time deforestation-alert system for the Cerrado and Amazon, developed by the Brazilian National Institute for Space Research (INPE)) reported a 33.6% reduction in deforestation alerts in the Brazilian Amazon during the first half of 2023 (compared to 2022), the Cerrado experienced a 21% increase in deforestation and conversion alerts during the same period[3]. In 2022, PRODES (Brazil's Satellite Native Vegetation Monitoring System, which is another monitoring programme run by INPE) recorded 10,681 km^2 of Cerrado deforestation, which is close in size to the vegetation lost across the Amazon (despite the Cerrado being less than half the area of the Amazon); this marks a third consecutive yearly increase[3]. The deforestation rates in the Cerrado are higher in its northern part (a region known as 'MATOPIBA', for Maranhão, Tocantins, Piauí and Bahia), where 71% of the loss of native Cerrado vegetation in 2022 took place[3] – including in lands that are exposed to climate change[4] and susceptible to desertification[5].

There have been similar alarming surges in vegetation loss through land conversion in other non-forest biomes. In sub-Saharan Africa, over 430 million hectares of non-forest natural vegetation in the miombo and Guinean savannah–woodlands are expected to be cleared for agriculture by 2060 (refs. 6,7). In the American Great Plains, the annual rate of natural grasslands conversion (mainly for crops) was higher than 0.8 million hectares in 2020 (ref. 8).

Urgent action is now imperative to ensure the inclusion of the remaining approximately 198 million hectares of the Cerrado, and other non-forest biomes, in the discussions at COP28. Including natural 'other wooded lands' and grasslands in the European Regulation on Deforestation-Free Products is also crucial. This would stimulate deforestation-free product regulation and a reduction in natural ecosystem conversion associated with commodity production in native non-forest ecosystems such the Cerrado and miombo.

The Cerrado is generally excluded from sustainability policies and initiatives related to agribusiness, including the 'Soy Moratorium'[9] (a multi-stakeholder zero-conversion agreement that is restricted to the Amazon forest biome). The same efforts to counteract rising deforestation in the Amazon must also be extended to combat natural vegetation loss in the Cerrado and other Brazilian biomes. The Cerrado is a crucial hub for cultivating essential commodities, and it is home to Indigenous peoples and traditional communities who depend on the sustainable use of the region's natural resources. Deforestation and natural vegetation conversion in this biome threaten biodiversity: projections indicate an unprecedented extinction of endemic plants (around 480 species) by 2050 (ref. 1). Additionally, these activities jeopardize carbon stocks, freshwater provision and livelihoods[2]. For example, ecosystem conversion in the Cerrado directly contributes to a 15% reduction in river discharge[10]. Unfortunately, these ecological and socioeconomic functions are now threatened by the dual forces of destruction of native vegetation and climate change.

Despite its global importance, the Cerrado remains insufficiently safeguarded. Only 3% of its area is under strict legal protection[11] and 62% of all Cerrado vegetation remnants are located within private landholdings[12,13]. Currently, these private areas receive only limited protection, as the Brazilian Forest Code legislation allows conversion of 65% to 80% of all native vegetation within individual properties – this is in contrast to the code's requirement of protection of 80% of native vegetation in private lands in the Amazon. Remaining native vegetation in other biomes with a substantial share of non-forest ecosystems – such as in the Caatinga, Pampas, Pantanal, Chaco, African savannahs and American Great Plains – is similarly vulnerable[3,8] to the expansion of agricultural commodities, which actively drives deforestation, conversion and ecosystem degradation and affects not only ecosystems but also economically vulnerable rural communities.

There is no simple solution to avoid native vegetation loss in the Cerrado, considering national norms that contribute to its high rate of deforestation and natural vegetation conversion. Several legal standards and public policies have been proposed to regulate Brazilian deforestation and greenhouse gas emissions in alignment with the international environmental agenda, but substantial revisions or extensions of these are required to mitigate vegetation loss in the Cerrado and other non-forest biomes. For example, the first 'Action Plan for the Prevention and Control of Deforestation and Fires in the Cerrado' (known as PPCerrado) – an instrument of the National Climate Change Policy – was established in 2010. Now, a revised version of PPCerrado is open for public consultation. Ensuring its ambition and robust implementation is crucial.

Another stumbling block to the protection of the Cerrado is the register of rural properties in the official system by self-declaration, the Rural Environmental Registry (CAR). It enables overlapping declarations and property rights claims. Moreover, this instrument would be weakened by a proposed Brazilian law (PL no. 2633/20) that would facilitate land regularization without government validation and also allow an increase in the deforestation rate in public areas. Furthermore, Indigenous lands face vulnerability owing to PL no. 2903/2023, which may result in increased land invasions and land grabber impunity and could lead to a potential 70% rise in deforestation within these regions[14].

It is urgent to coordinate policy instruments and projects to avoid deforestation and conversion leakage from forest to non-forest biomes. These strategies must not only prevent further conversion and loss of natural vegetation, but also encompass water resources and fire management, establish ecological corridors, restore converted and degraded lands, and protect the territories of Indigenous peoples and traditional communities. Economic incentives will be needed to conserve the entirety of Cerrado remnants, including those within private properties[13], Indigenous land and public areas. Effectively implementing REDD+ and solidifying the payment for ecosystem services programmes in the biome are also fundamental to decreasing its deforestation rate. COP28 is an opportunity to highlight the importance of non-forest ecosystems and their role in the current climate crisis. The comprehension and valorization of the Cerrado's uniqueness and biological and social importance, both at the national and global levels, can enhance the effectiveness of its protection.

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Competing interests

The authors declare no competing interests.