

OPEN LETTER

Urban forests as essential infrastructure for climate resilience and biodiversity: A call to policymakers

OPEN LETTER TO POLICYMAKERS AT THE 30TH MEETING OF THE CONFERENCE OF THE PARTIES TO THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (COP 30, BELÉM, BRAZIL)

By 2050, nearly 70% of the global population will live in cities (UN, 2018), increasing the demand for urban green spaces. Urban areas are facing increasing risks from climate change, including heatwaves, flooding, wildfires, and growing social inequality, which challenges urban planning and design. Urban forests form the backbone of green infrastructure supporting resilient, equitable, and sustainable cities. Importantly, their cost-effective benefits advance sustainable development, climate action, and biodiversity conservation.

WHAT ARE URBAN FORESTS AND WHY DO THEY MATTER?

Urban forests include all woody and understorey vegetation within and around dense settlements, from cultivated trees in streets, parks, and gardens to self-sustaining stands in remnant and peri-urban woodlands (FAO, 2016). As essential nature-based solutions (Cohen-Shacham et al., 2016), urban forests provide multiple ecosystem services. They help cool urban temperatures, reduce air pollution, enhance soil infiltration, slow stormwater runoff, buffer extreme weather, and support human health (Livesley et al., 2016). They contribute significantly to climate adaptation and moderately to mitigation by reducing the energy demand for cooling (McPhearson et al., 2023). Urban forests also enhance biodiversity by providing habitats and climate refugia at multiple scales (Alvey, 2006).

Trade-offs in urban forest benefits, costs, and the impacts of policy interventions, such as those related to measurement, outcomes, or implementation, remain complex (Vogt et al., 2015), but the loss of canopy reduces air quality, biodiversity, and resilience to floods, droughts, pests, and extreme heat (Nowak, 2018). Canopy loss impairs recreation and impacts physical and mental health (Carrus

et al., 2015). Because urban forests are inherently dynamic systems, the death or removal of large and mature trees should be anticipated through proactive planning for their replacement, including careful consideration of which species are selected and why. Unequal access drives social-environmental injustice and health inequities, which can be addressed through greenspace expansion, equitable distribution, and better management (Esperon-Rodriguez et al., 2025).

URBAN FORESTS AT INCREASING RISK FROM STEWARDSHIP GAPS

Urban forests are increasingly at risk due to significant stewardship gaps. Despite the existence of international management standards, ongoing tree losses result from pests introduced through trade, climate and pollution stress, inadequate legal protections, rapid urban densification, and insufficient maintenance (Esperon-Rodriguez et al., 2022; Paap et al., 2017; Vogt et al., 2015). Planting alone cannot offset accelerated mature tree losses or replace the vital functions these trees provide over their shortened lifespans in urban environments. Closing the stewardship gap demands urgent investment, robust funding, and stronger policy to sustain diverse and resilient urban forests.

POLICY PRIORITIES FOR VISIONARY ACTION

- Invest in urban forests as infrastructure.** Recognize and fund urban forests as essential and critical green infrastructure and natural health systems. Integrate trees into city budgets and legal, financial, accounting (e.g., ecosystem accounting), and planning frameworks. Urban planning must prioritize retaining existing green infrastructure, mature trees, and biodiversity over 'clear and build' approaches. Protecting mature trees requires stronger illegal removal penalties, safeguards, and incentives like property tax reductions proportional to canopy or municipal long-term care support.

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2. **Deliver equity and access.** Close canopy gaps in underserved neighborhoods by co-designing local canopy and access targets with communities and securing stewardship of soils, understorey, and habitat. Leverage natural regeneration on vacant lots, rights-of-way, and riparian buffers with community stewardship. Adopt 'retain-and-grow' policies crediting regenerating trees in approvals and protecting recruitment during construction. Prioritize structural and functional diversity, including native and climate-adapted species, understorey, soils, and genetically rich plantings that deliver ecosystem services equitably and sustain diverse urban wildlife. Set diversity thresholds for species and provenance to increase resilience. Public outreach should build on diverse community values and strengths, empowering marginalized groups and embedding green space through inclusive planning to counter densification-driven disparities.
3. **Mainstream in climate and biodiversity governance.** Embed urban forests in global to local strategies for mitigation, adaptation, and biodiversity conservation, supported by climate finance. Set ambitious, ecologically grounded, measurable targets for canopy, diversity, and equitable access, aligned with the Paris Agreement, the Convention on Biological Diversity, and the UN Sustainable Development Goals (CBD, 2025; Paris Agreement, 2015; UN, 2025). Targets must build on past lessons. Recognize urban forests as critical climate and biodiversity infrastructure, include measurable goals (e.g., canopy cover, distribution, five-year survival) in Nationally Determined Contributions (NDCs) and National Biodiversity Strategies and Action Plans (NBSAPs), and ensure financing for long-term stewardship. Multi-level governance and local actor participation are essential.
4. **Strengthen resilience with adaptive, evidence-based management.** Invest in integrated management systems involving cross-sector collaboration, Indigenous and community knowledge, monitoring, research, and planning, capturing public and private trees. Identify funding for long-term maintenance amid rising pests, disease, and climate extremes. Build species and genetic diversity with nursery investments and supply-chain incentives. Promote guided spontaneous regeneration where safe to accelerate recruitment and relieve nursery bottlenecks. Treat trees as urban assets eligible for capital depreciation and tax incentives reflecting long-term benefits.

WHY ACT NOW?

Urban forests are among the most effective, equitable nature-based solutions available. When protected and resourced, they cool neighborhoods, manage stormwater, store carbon, support biodiversity, and improve health, especially in underserved communities. Yet mature tree loss outpaces replacement amid increasing climate and biological stresses. We urge COP30 policymakers to treat urban forests as essential and critical city infrastructure: safeguard mature trees, set and finance SMART canopy, diversity and access targets,

mainstream urban forests in climate and biodiversity plans, and fund long-term operations, monitoring, nursery capacity, and biosecurity. Implementing this visionary action delivers cooler, healthier, more biodiverse, and more equitable cities now and for future generations.

KEYWORDS: canopy cover targets, climate resilience and adaptation, community engagement, ecosystem services, environmental justicegreen infrastructure, nature-based solutions, social equity

AUTHOR CONTRIBUTIONS

MER and MGT led the initiative and drafted the letter. All authors provided feedback, edited, and agreed with the content of the letter. All authors, except MER and MGT, are listed alphabetically.

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We declare no conflict of interest.

DATA AVAILABILITY STATEMENT

There are no data associated with the article.

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