

# Conserving Kota Damansara Community Forest Reserve: Sustaining Urban Nature in a Rapidly Developing Landscape

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## Abstract

Kota Damansara Community Forest Reserve (KDCFR) is one of the last remaining lowland dipterocarp forests within the rapidly urbanising Klang Valley. This paper discusses the ecological, social, and cultural importance of the reserve, highlighting its role as a critical biodiversity refuge and a vital recreational space for surrounding communities. The forest supports a range of ecosystem services, including climate regulation, habitat protection, and opportunities for nature-based recreation and environmental education. The paper also emphasises the unique collaborative management model involving state authorities, local communities, and civil society organisations, which has been central to defending the reserve from development pressures. However, challenges such as increasing visitor demand, funding constraints, and ongoing urban encroachment require renewed and sustained conservation strategies. The discussion underscores the need for inclusive stewardship, long-term financing, and strengthened ecological protection to ensure that KDCFR continues to function as an accessible and resilient urban green sanctuary for future generations.

**Keywords:** Urban Forest Conservation, Biodiversity Protection, Community Stewardship, Sustainable Recreation, Green Infrastructure Management

## Introduction

The rapid pace of urbanisation in Malaysia has intensified pressures on natural ecosystems, particularly in major urban regions such as the Klang Valley. Urban expansion, infrastructure development, and land-use change continue to reduce natural habitats, making the conservation of remaining green spaces increasingly vital (Wang et al., 2024). Within this context, the Kota Damansara Community Forest Reserve (KDCFR) in Petaling Jaya stands as one of the last surviving lowland dipterocarp forests in the region. Beyond its ecological importance, KDCFR provides a wide range of ecosystem services, including microclimate regulation, habitat provision, carbon storage, and opportunities for recreation and

environmental education (Sari & Bayraktar, 2023). These benefits contribute significantly to both urban biodiversity conservation and community well-being. At the same time, debates within the social sciences increasingly highlight the uneven distribution of access to urban nature, the governance tensions surrounding urban green infrastructure, and the social justice implications of conserving natural spaces within rapidly developing cities. Situating KDCFR within these broader discussions underscores its relevance not only as an ecological asset but also as a site where competing social, cultural, and political values intersect.

Despite its official status as a forest reserve, KDCFR faces mounting conservation challenges. The surrounding urbanisation has led to habitat fragmentation, increased visitor pressure, trail degradation, and disturbances to wildlife. The forest is freely accessible to the public, and while this encourages community engagement, it also raises concerns about long-term financial sustainability (Kiss et al., 2022). Maintenance, monitoring, habitat restoration and the development of educational and recreational facilities require continuous resources and strategic management. Without sufficient funding and institutional support, the ecological integrity of the reserve may be compromised (Wang et al., 2023). Furthermore, increasing recreational use highlights the need for sustainable visitor management approaches that balance access with conservation priorities. Recent empirical studies from other Asian and global urban reserves similarly report that rising recreational demand, limited enforcement capacity, and inconsistent financing are among the most critical pressures affecting urban forest resilience (e.g., Doucet et al., 2024; Singini & Baso, 2025). Incorporating these insights emphasises that the challenges observed in KDCFR are part of wider international patterns that require integrated social–ecological responses.

The significance of KDCFR extends beyond its ecological value; it serves as an important social and cultural space for surrounding communities. Residents frequently visit the reserve for hiking, cycling, nature appreciation and community gatherings. Local stewardship organisations such as Friends of Kota Damansara (FoKD) play an active role in forest conservation, advocacy and environmental awareness programmes (Nath & Magendran, 2021). Their involvement demonstrates a strong community commitment to protecting the forest. However, community-based efforts alone are not sufficient. Long-term conservation requires coordinated governance, adequate funding and policy support that recognise urban green spaces as essential components of sustainable city planning (Puchol-Salort et al., 2021). Moreover, current scholarship on community-based urban conservation stresses the importance of understanding how local stewardship interacts with institutional arrangements, socio-economic inequalities, and public perceptions of environmental responsibility. Positioning KDCFR within this research agenda allows a more explicit examination of how social dynamics influence ecological outcomes.

The purpose of this paper is to highlight the ecological significance and socio-cultural value of KDCFR, discuss the current pressures affecting its sustainability, and propose strategies for long-term conservation. In doing so, the paper contributes to broader discussions on the protection of urban green spaces in rapidly developing regions. Preserving KDCFR is not merely about protecting a patch of forest; it is about safeguarding biodiversity, supporting community well-being and ensuring that urban development progresses in harmony with environmental sustainability. By engaging with current debates in urban social–ecological research—particularly those concerning collaborative governance, environmental

equity, and the role of community stewardship—this study offers insights into how urban forest reserves can be protected amid intensifying development pressures and shifting public expectations.

### Literature Review

Urban green spaces (UGS) have emerged as indispensable components of resilient cities, delivering a spectrum of ecological, social and cultural benefits that underpin human well-being (Dmitrović et al., 2025). Studies across diverse geographies consistently show that UGS provide regulating services (microclimate amelioration, stormwater attenuation, air purification), supporting services (habitat for flora and fauna, pollination), provisioning services (non-timber resources and sometimes food) and cultural services (recreation, education, spiritual values). In rapidly urbanising regions, remnant patches of natural forest within city boundaries—such as community forest reserves—play a particularly critical role because they retain elements of native biodiversity that are otherwise lost in heavily modified landscapes (Zhou et al., 2022). Lowland dipterocarp fragments are of especially high conservation value in Southeast Asia, given their species richness, endemic taxa and disproportionate vulnerability to conversion. The Kota Damansara Community Forest Reserve (KDCFR), situated within the Klang Valley's urban matrix, exemplifies these functions: it is simultaneously a biodiversity refuge, a recreational amenity for dense neighbourhoods, and a natural laboratory for environmental education. Recent empirical scholarship further highlights the social equity dimensions of UGS, noting that access, governance, and benefits are often unequally distributed across urban populations (Wong et al., 2023). This reinforces the need to understand UGS such as KDCFR not only ecologically, but also through the lens of contemporary social science debates on environmental justice and urban sustainability.

Conservation in urban forest reserves confronts a distinct set of challenges compared with rural protected areas. Chief among these are land-use pressures from development, habitat fragmentation and edge effects, which together reduce ecological integrity and increase vulnerability to invasive species and microclimatic shifts (Singini & Baso, 2025). Urban reserves also face intense recreational pressure: while public access fosters stewardship and delivers social value, unmanaged visitation can accelerate trail erosion, littering, disturbance to wildlife and degradation of sensitive microhabitats. Pollution and altered hydrological regimes from adjacent urban infrastructure further modify forest processes, reducing recruitment and altering species composition (O'Brien et al., 2022). Importantly, the political economy of urban land often places conservation in direct competition with housing, commercial and transport priorities, making long-term protection contingent on sustained policy attention and viable financing. Recent case studies from Indonesia, China and Brazil show similar patterns, where urban forest patches experience escalating visitor pressure, insufficient enforcement and conflicting land-use priorities—highlighting the global relevance of these challenges (Haryanto et al., 2023; Liu et al., 2024).

Governance and institutional arrangements, therefore, shape conservation outcomes (Ayambire et al., 2025). Traditional command-and-control protection is often inadequate in urban contexts where multiple stakeholders—municipal authorities, forestry departments, local communities, NGOs and private landowners—have intersecting interests. Co-management and participatory governance have been increasingly advocated: when local communities and civil society groups are actively engaged in planning, monitoring and

benefit-sharing, compliance and legitimacy improve (Khan et al., 2022). Community forest approaches that combine legal protection with local stewardship (e.g., volunteer patrols, community monitoring, stewardship agreements) can be particularly effective in urban reserves because they align conservation objectives with local livelihood and recreation needs. In the KDCFR context, partnerships between state forestry agencies and community groups can translate public support into practical on-ground management. However, recent empirical research shows that participatory governance models succeed only when power-sharing is genuine and institutional responsibilities are clearly defined (Rai et al., 2023). This underscores the need to evaluate how far KDCFR's existing governance arrangements align with these effectiveness criteria.

Financing is another recurring theme in the literature. Urban reserves frequently suffer from budgetary constraints within government agencies, while the public good character of forests limits private investment (Doucet et al., 2024). Innovative financing mechanisms—modest entrance fees, membership schemes, corporate sponsorships, payment for ecosystem services (PES), and trust funds—have been trialled in various contexts to generate predictable revenue streams. Importantly, design matters: fees must be equitable and sensitive to local socioeconomic diversity to avoid exclusion, and revenue governance must be transparent to maintain public trust (Thompson et al., 2023). Non-monetary contributions, including volunteering and in-kind support from local businesses, are also valuable complements to formal funding. Emerging studies also emphasise hybrid funding models that combine government allocations with community fundraising and private-sector partnerships, which have demonstrated improved sustainability in urban protected areas in Singapore, Seoul, and Tokyo (Lim & Tan, 2024).

Ecological restoration and adaptive management are essential for urban forest resilience (Simonson et al., 2021). Restoration approaches that prioritise native species, connectivity and structural complexity increase habitat value for native fauna and enhance ecosystem service delivery. Connectivity—linking isolated patches through green corridors or stepping stones—mitigates the negative effects of fragmentation, enabling species movement and genetic exchange. Adaptive management, informed by regular monitoring of biodiversity indicators, visitor impacts and hydrological health, allows managers to adjust interventions in response to changing conditions (Zuniga-Teran et al., 2022). In urban reserves, monitoring programs that incorporate community science can both expand data collection capacity and strengthen public engagement. Recent empirical assessments show that community-based biodiversity monitoring can significantly enhance data resolution while strengthening local stewardship, suggesting its potential applicability for KDCFR (Perez et al., 2023).

Environmental education and interpretive services are vital to long-term conservation success (Tan & Nurul-Asna, 2023). Interpretive signage, guided walks, school programmes and citizen science increase public awareness of ecological processes and threats, translating appreciation into supportive behaviours. Research demonstrates that educational outreach can shift perceptions of responsibility from passive expectation of government provision to active stewardship and willingness to support conservation—financially or through volunteering (Kiss et al., 2022). Recent interventions in urban parks across Thailand and Vietnam show measurable improvements in pro-environmental behaviour following

sustained educational programmes, suggesting similar opportunities for KDCFR (Phan et al., 2024).

Finally, situating urban conservation within broader policy frameworks—municipal planning, climate adaptation strategies and sustainable development goals—strengthens institutional support (Salvador & Sancho, 2021). Recognising urban forests as critical infrastructure (urban green infrastructure) reframes them from optional amenities to essential services that warrant investment. Integrating conservation objectives into land-use planning reduces ad hoc destruction and enables proactive protection. New policy analyses also highlight the importance of embedding urban forest conservation within climate-resilience agendas, particularly in tropical cities experiencing intensifying heatwaves, flooding and biodiversity loss (Rahman et al., 2024).

In sum, the literature suggests a multifaceted approach for conserving urban forest reserves like KDCFR: protect and restore ecological values; manage visitor use to minimise impacts; develop equitable and diversified financing; embed participatory governance; invest in education and monitoring; and align forest conservation with urban planning and climate resilience agendas. Translating these general principles into locally appropriate strategies—attuned to KDCFR's ecological characteristics, user demographics, institutional context and development pressures—offers the best prospect for sustaining this crucial urban natural asset into the future. By integrating recent empirical findings and ongoing social science debates, this review underscores the need for holistic, socially attuned conservation strategies for urban forests in rapidly developing contexts.

## **Materials and Methods**

This study employed a qualitative case study approach to investigate the conservation status, ecological significance, and management practices of the Kota Damansara Community Forest Reserve (KDCFR), situated within the rapidly urbanising Klang Valley. The case study method was selected to allow an in-depth exploration of both ecological and socio-cultural dimensions of urban forest conservation, integrating multiple data sources to enhance the reliability and richness of findings. Data collection involved a combination of field-based ecological assessments, document analysis, and stakeholder engagement. Field observations were systematically conducted over multiple visits to assess forest structure, canopy cover, species composition, and signs of anthropogenic impacts such as littering, trail erosion, and informal encroachment. Ecological surveys focused on key flora and fauna, including rare, endemic, and threatened species, using established sampling protocols such as quadrat and transect methods for vegetation, and visual encounter and acoustic surveys for fauna.

Complementary to fieldwork, an extensive review of secondary sources was undertaken, including forest management plans, governmental and non-governmental reports, policy documents, and relevant scientific literature, to provide context on governance frameworks, conservation initiatives, and historical land use patterns. To capture socio-cultural and institutional perspectives, semi-structured interviews were conducted with a diverse range of stakeholders, including local community members, civil society organisations, and government officials involved in forest management. These interviews explored perceptions of the forest's ecological and recreational value, challenges in maintaining the reserve, and strategies for sustainable management. All collected data were systematically synthesised and analysed thematically, integrating ecological findings with

social and governance insights, to provide a comprehensive understanding of the reserve's current status, management effectiveness, and potential pathways for long-term conservation in an urbanising landscape.

### **Results and Discussion**

The Kota Damansara Community Forest Reserve (KDCFR) was found to retain significant ecological, social, and cultural value despite being embedded in a rapidly urbanising landscape. Field observations and ecological surveys revealed a structurally complex forest dominated by lowland dipterocarp species, with a diverse understory supporting numerous ferns, shrubs, and ground-dwelling plants. Faunal assessments identified a variety of bird, reptile, and mammal species, including several species of conservation concern, indicating that the reserve functions as an important refuge for biodiversity in an otherwise fragmented urban environment (Schnetler et al., 2021). Signs of anthropogenic pressure, such as informal trails, litter accumulation, and occasional encroachment, were present but remained relatively localised, suggesting that current management and community stewardship efforts have been partially effective in limiting widespread degradation. These patterns mirror recent empirical findings in other tropical urban reserves, where remnant forest patches continue to harbour substantial biodiversity despite surrounding development, provided that localised pressures are managed (Liu et al., 2023; Haryanto et al., 2024).

Interviews with stakeholders highlighted the critical role of collaborative governance in sustaining KDCFR. State authorities, local communities, and civil society organisations jointly contribute to forest protection through monitoring, educational outreach, and advocacy, creating a shared sense of responsibility. Community members reported that the forest provides opportunities for recreation, environmental education, and spiritual connection with nature, underscoring its social and cultural significance. However, rising visitor numbers and ongoing urban development were consistently cited as emerging challenges, indicating the need for adaptive management strategies (Wang et al., 2024). These dynamics align with current social science debates emphasising the tension between promoting public access to nature and mitigating ecological impacts—an issue increasingly recognised as central to urban environmental governance (Rahman et al., 2024).

Document analysis and stakeholder perspectives revealed that while existing policies and community initiatives provide a foundation for conservation, gaps remain in long-term financing, ecological monitoring, and enforcement against encroachment. Integrating ecological data with governance insights suggests that sustaining KDCFR requires a multi-pronged approach that balances biodiversity protection with public access and educational use. Strengthening inclusive stewardship, enhancing ecological monitoring programs, and securing dedicated funding are essential to ensure the forest's resilience (Baird et al., 2021). Recent studies highlight that urban forest reserves with strong co-governance arrangements and diversified financing mechanisms demonstrate higher long-term ecological and social performance (Lim & Tan, 2024), suggesting clear avenues for improving KDCFR's management framework.

These findings align with broader urban ecology research, which highlights that small but well-managed urban green spaces can significantly contribute to biodiversity conservation, climate regulation, and human well-being. Moreover, the KDCFR case provides

empirical support for contemporary arguments in social–ecological systems research that emphasise co-management, local stewardship, and community participation as key determinants of urban conservation success. Overall, KDCFR exemplifies how collaborative urban forest management can maintain ecological integrity while providing social and cultural benefits, even amidst intense urbanisation pressures. By situating the results within ongoing debates about sustainability transitions, environmental justice, and participatory governance, this study demonstrates how locally grounded conservation practices can inform wider discussions on managing urban nature in rapidly developing cities.

### **Conclusion**

The Kota Damansara Community Forest Reserve (KDCFR) demonstrates the critical importance of urban green spaces in rapidly developing landscapes. This study shows that the reserve not only serves as a vital refuge for biodiversity, including rare and threatened species, but also provides essential ecosystem services such as climate regulation, habitat conservation, and opportunities for recreation and environmental education. The success of KDCFR is strongly linked to its collaborative management model, which engages state authorities, local communities, and civil society organisations in shared stewardship. This aligns with growing empirical evidence that co-governance arrangements enhance legitimacy, compliance, and public support in urban conservation initiatives.

Despite these achievements, the reserve faces ongoing pressures from increasing visitor demand, urban encroachment, and limited funding, highlighting the need for adaptive management and sustained conservation strategies. Ensuring the long-term resilience and accessibility of KDCFR will require strengthened ecological protection, inclusive governance, and reliable financing mechanisms. These requirements reflect broader debates in the social sciences regarding the governance of common-pool natural resources, the equity implications of urban environmental management, and the challenges of balancing public access with ecological integrity.

Ultimately, the case of KDCFR underscores the potential for community-driven conservation to safeguard urban nature, offering valuable insights for preserving other urban forest ecosystems in rapidly transforming cities. By situating KDCFR within contemporary discussions on environmental justice, participatory governance, and urban sustainability transitions, this study contributes evidence that well-supported community stewardship can play a decisive role in maintaining ecological resilience and social value in urban green spaces. As cities continue to expand, examples such as KDCFR illustrate how locally grounded, socially inclusive strategies can help embed nature within urban futures.

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