

EVALUATING DAVAO CITY'S GREEN SPACES: A SYSTEMATIC REVIEW

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ABSTRACT

Urban green spaces are essential components of sustainable urban development, providing critical ecological, social, and economic benefits. In Davao City, prominent green spaces such as People's Park, Magsaysay Park, and Osmeña Park are increasingly under threat due to the pressures of rapid urbanization, poor management practices, and overcrowding. This study employs a systematic literature review (SLR), guided by PRISMA methodologies, to assess the sustainability challenges and risks of these spaces falling into the tragedy of the commons. The findings underscore the urgent need for localized governance and proactive strategies to safeguard these urban resources, highlighting actionable pathways for effective management and community engagement.

Keywords: Urban green spaces, Tragedy of the Commons, sustainability, community engagement, Davao City

1. INTRODUCTION

Urban green spaces play a fundamental role in creating sustainable cities by delivering numerous environmental, social, and health benefits. These areas contribute to mitigating air pollution, reducing the urban heat island effect, and promoting the physical and mental well-being of urban populations (UN-Habitat, 2012). As urbanization accelerates globally, the demand for accessible and well-maintained green spaces continues to grow, yet many cities struggle to preserve and sustain these critical resources. In Davao City, where over 75% of the population resides in urbanized areas (Philippine Statistics Authority, 2023), the situation is no different. Iconic parks such as People's Park, Magsaysay Park, and Osmeña Park are increasingly strained by overcrowding, inadequate infrastructure, and insufficient maintenance efforts.

Despite their importance, the management of Davao City's green spaces has not kept pace with urban growth. Hardin's (1968) Tragedy of the Commons offers a theoretical lens to understand how shared resources, like green spaces, can be overexploited in the absence of effective governance. Complementing this, Ostrom's (1990) Commons Theory emphasizes the potential of collective action and community-led management to address such challenges. These frameworks are instrumental in framing this study's exploration of sustainability issues in Davao City's green spaces. To analyze these challenges comprehensively, this research adopts a systematic literature review (SLR) approach, following PRISMA guidelines to ensure a structured and transparent synthesis of existing knowledge. This research aims to address the following objectives: first, to evaluate the current state of Davao City's green spaces in terms of usage and maintenance; second, to identify the risks of resource degradation and the factors driving overexploitation; third, to examine the adequacy of existing sustainability management practices; and finally, to assess public awareness and involvement in preserving these urban assets.

The study's significance lies in its potential to inform urban planning and policymaking for cities facing similar challenges. By providing evidence-based insights into the risks and opportunities associated with urban green spaces, this research aims to contribute to creating more sustainable and resilient urban environments. Through targeted recommendations, it seeks to bridge the gap between theory and practice, empowering stakeholders to adopt innovative and collaborative approaches to green space governance. This study not only addresses the immediate challenges in Davao City but also offers broader lessons for managing urban commons in rapidly urbanizing regions.

2. METHODOLOGY

Design. This study employed a systematic literature review (SLR) to evaluate the sustainability and risks associated with the tragedy of the commons in Davao City's urban green spaces. The research adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework, a widely recognized guideline for ensuring transparency and rigor in systematic reviews (Page et al., 2021; Moher et al., 2009). PRISMA provides a structured process encompassing four critical stages: Identification, Screening, Eligibility, and Inclusion, ensuring that only high-quality studies relevant to the research objectives are included.

In the identification phase, a search strategy was developed using a modified Population, Intervention, Comparison, and Outcome (PICO) framework to define keywords and search terms. The framework targeted studies on urban green

spaces (Population), sustainability practices and the risks of the tragedy of the commons (Intervention), governance and management strategies (Comparison), and measurable outcomes related to community engagement and sustainability (Outcome). The keywords included “urban green spaces,” “tragedy of the commons,” “community-based management,” “sustainability practices,” and “urban biodiversity conservation.” Boolean operators (AND, OR) were utilized to refine search results. Searches were conducted across databases, including MDPI, Semantic Scholar, Google Scholar, JSTOR, and ResearchGate, yielding a total of 320 studies. No geographical or institutional restrictions were applied during this phase to ensure a comprehensive review (Gough et al., 2017).

The screening phase narrowed down the studies through the removal of duplicates and irrelevant articles which left with 220. Titles and abstracts were reviewed to assess relevance to the research questions, such as the role of community participation in urban green space management, the sustainability of urban green spaces, and governance practices. After the screening process, 70 studies remained, with each study evaluated for direct alignment with the research scope and goals. The studies retained at this stage provided meaningful insights into green space sustainability and community engagement (Liberati et al., 2009).

During the eligibility phase, the studies were thoroughly assessed using inclusion and exclusion criteria. Inclusion criteria required studies to have been published in peer-reviewed journals within the last 10 years to ensure contemporary relevance (Jones et al., 2019). Eligible studies were required to provide empirical evidence or theoretical contributions related to urban green spaces, governance, or community-based management. Furthermore, studies with a focus on tropical climates or regions experiencing rapid urbanization, similar to Davao City's context, were prioritized (Ahmed et al., 2021). Exclusion criteria involved removing articles that lacked accessible full texts, offered insufficient empirical data, or addressed unrelated topics. After applying these criteria, 40 studies were deemed eligible for further analysis.

The inclusion phase finalized the selection of studies for the systematic review. Only those with robust methodologies, such as GIS-based analyses, ecological assessments, or participatory management frameworks, were considered. By the end of this phase, 30 studies met all criteria and were included for synthesis. These studies represented a diverse set of insights into urban green space sustainability, risks of resource depletion, and the role of community governance (Higgins et al., 2021).

Data extraction and synthesis were conducted systematically to ensure reliability and consistency. Each study's key details, including authorship, objectives, methodologies, and findings, were recorded using a standardized extraction form. Thematic analysis was performed to identify recurring patterns and themes, such as governance challenges, community involvement, and ecological benefits. These themes informed the development of recommendations for improving the sustainability of Davao City's green spaces (Clarke & Braun, 2013).

The study's systematic process is visually summarized using a PRISMA flow diagram, which details the number of studies at each stage of the review. The diagram provides a clear representation of the progression from initial identification to final inclusion, enhancing the transparency of the review process.

Although this study relied solely on publicly available secondary data, ethical considerations were upheld by properly attributing all sources and ensuring transparency in the methodology. However, certain limitations were acknowledged. The reliance on secondary data constrained the analysis to available literature, potentially overlooking relevant non-English studies. Additionally, the exclusion of gray literature, such as unpublished reports, may have limited the scope of insights into local practices. Despite these limitations, the rigorous application of PRISMA guidelines ensures that the findings are robust and credible.

Table. 1 Distribution of Studies in Peer-Reviewed Journals and Databases

Source	Number
MDPI	5
Google Scholar	30
Semantic Scholar	30
JSTOR	5
ResearchGate	10

Among the 40 studies that met the eligibility criteria, 4 were sourced from MDPI, 5 from JSTOR, 25 from Semantic Scholar, 35 from Google Scholar, and 10 from ResearchGate. All of these studies were also accessible through Semantic Scholar and Google Scholar, ensuring comprehensive access to high-quality, credible content.

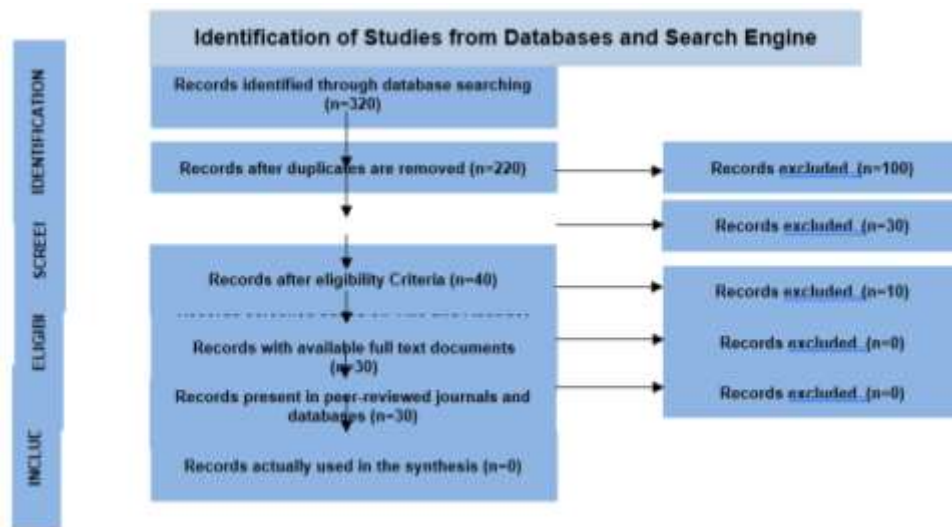


Fig. 1 Contextualized PRISMA Model Used in the Study

By adhering to a thorough and structured approach, this study ensures that only the most relevant, up-to-date, and well-conducted research informs the development of best practices for improving green spaces in urban areas like Davao City. This method, grounded in established systematic review techniques, offers a clear path to answering the research questions and providing practical insights.

3. RESULTS AND DISCUSSIONS

Assessing the Current State of Davao City's Green Spaces

Green spaces in urban areas are essential for the well-being of residents, offering ecological, social, and recreational benefits. In Davao City, key green spaces such as People's Park, Magsaysay Park, and Osmeña Park play a crucial role in improving the quality of life for citizens and visitors alike. However, as the city continues to grow, the effective management and maintenance of these spaces have become increasingly challenging. This section aims to assess the current state of Davao City's green spaces by examining usage patterns, identifying key issues affecting their functionality, and discussing potential solutions to ensure their continued benefits for future generations.

Usage Patterns of Green Spaces. Davao City's primary green spaces—People's Park, Magsaysay Park, and Osmeña Park—serve vital ecological and social functions. People's Park, recognized for its well-designed layout conducive to fitness activities such as Zumba and jogging, is the most frequented among these spaces (Regalado, 2023). Similarly, Osmeña Park provides shaded areas that offer respite from urban heat (San Jose, 2014). However, these benefits are increasingly compromised by overcrowding, insufficient infrastructure maintenance, and limited supervision (Singco, 2023).

Maintenance Challenges. Maintenance deficiencies are evident across all three parks, with irrigation systems, turf care, and lighting falling short of user needs. Issues such as litter, soil erosion, and poor plant health further highlight the inadequacy of current management strategies, which appear reactive rather than preventive (Wilson et al., 2020). These findings underscore the need for incorporating ecological principles into urban planning to mitigate resource degradation and enhance user satisfaction (San Jose, 2014).

Identifying Risks of Resource Degradation

Risks of resource degradation in Davao City's green spaces are primarily driven by overcrowding, environmental pollution, and inadequate infrastructure, all of which threaten their ecological and social functions.

Overcrowding and Infrastructure Stress. The deterioration of Davao City's green spaces points to significant risks of resource degradation. Overcrowding, particularly during festivals and events at Magsaysay Park, results in damaged turf and compacted soil, further straining the park's limited resources (Singco, 2023). Without targeted interventions, these green spaces risk reaching an irreversible state of resource depletion, commonly referred to as carrying capacity overshoot (Wilson et al., 2020).

Governance Gaps. Such conditions align with Garrett Hardin's Tragedy of the Commons theory, where a lack of governance leads to overexploitation of shared resources (Hardin, 1968). Addressing these risks requires reclassifying green spaces from open-access public goods to managed common resources. Ostrom's principles of collective governance offer actionable guidelines for achieving sustainable management, such as implementing local rules and engaging stakeholders (Ostrom, 1990).

Evaluating the Sustainability Management of Green Spaces

The sustainability management of Davao City's green spaces is evaluated in terms of the effectiveness of current policies and practices, with a focus on their ability to maintain ecological balance and ensure equitable public access.

Current Management Practices. The sustainability management of Davao City's green spaces shows notable gaps. While People's Park demonstrates some positive practices, such as partial adherence to eco-friendly maintenance standards, broader management strategies lack integration with long-term sustainability frameworks. This deficiency is compounded by rapid urbanization and a growing population, exacerbating the city's green space deficiency (Regalado, 2023).

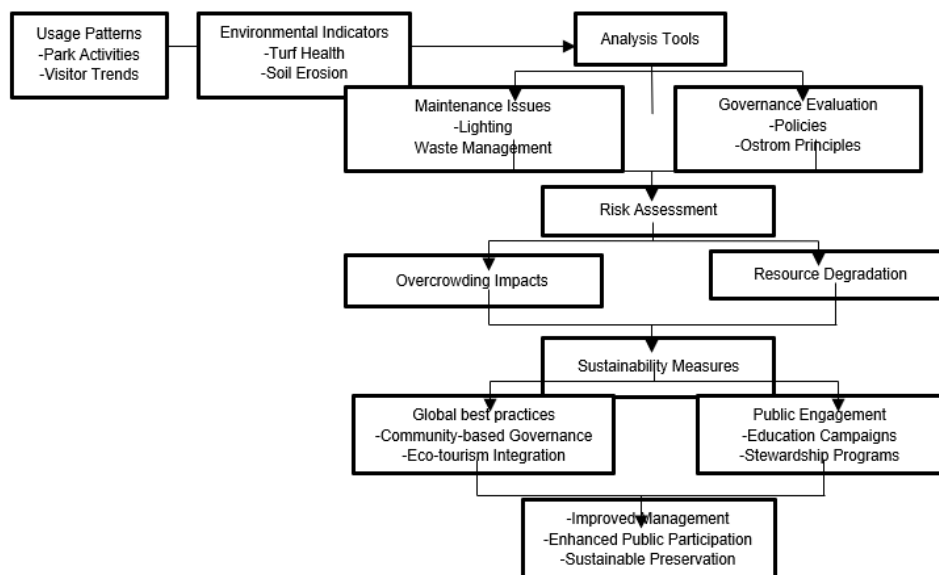
Lessons from Global Practices. Adopting global best practices can provide valuable lessons. Community-based governance models, such as those highlighted by Byrne and Sipe (2010), emphasize participatory decision-making and stakeholder engagement. These principles could be applied locally by empowering residents through stewardship programs and participatory governance mechanisms. Additionally, incorporating eco-tourism as a funding source could address financial constraints while promoting conservation awareness (Regalado, 2023). Strengthening enforcement of visitor behavior and maintenance policies is also critical for improving sustainability outcomes (Wilson et al., 2020).

Enhancing Public Awareness and Involvement in Green Space Preservation

Current Levels of Awareness and Action. Public awareness about the ecological and recreational benefits of green spaces in Davao City is moderate, with 45% of surveyed residents participating in activities such as cleanup drives and volunteer programs (Singco, 2023). However, this level of engagement is insufficient to foster a robust culture of green space preservation (Bujis et al., 2016).

Strategies for Increased Engagement. Programs designed to increase public participation, such as "adopt-a-park" initiatives or community-led maintenance efforts, can significantly enhance stewardship (Byrne & Sipe, 2010). Educational campaigns and incentives can further bridge the gap between awareness and action, cultivating a sense of ownership among residents (Bujis et al., 2016). Empowering local communities through such initiatives not only strengthens green space sustainability but also fosters greater social cohesion (Regalado, 2023).

STUDY FRAMEWORK



4. CONCLUSION AND RECOMMENDATIONS

The findings underscore critical challenges and opportunities in managing Davao City's green spaces which will result to tragedy of the commons if not mitigated. Key issues include overcrowding, maintenance deficiencies, governance gaps, and insufficient public involvement.

To ensure their sustainability and mitigate risks of resource depletion, the following policy recommendations are proposed. A proactive maintenance practices must be upheld, through transitioning from reactive to preventive maintenance strategies to adequately address resource degradation. Community-based governance must be applied with the integration of Ostrom's principles to enhance collective management and accountability among stakeholders and the community. Moreoso, public engagement campaign is seen as a good avenue for education and outreach endeavors to promote active community participation in green space preservation. Lastly, the integration of eco-tourism is suggested as a sustainable funding mechanism to support green space conservation efforts.

Implementing these measures will create a balanced framework for managing Davao City's green spaces, ensuring the preservation of their ecological, social, and recreational benefits for future generations. Additionally, it is recommended that further studies explore the integration of the tragedy of the commons and commons theory in relation to green spaces. This approach could broaden the interpretation of emerging concerns and highlight the implications of neglecting the collective responsibility in safeguarding these vital areas.

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