JURNAL ILMU LINGKUNGAN
Volume 24 Issue 1 (2026) : 80-91 *ISSN 1829-8907*

Sustainable Landscape Management Strategies for Urban Parks: Lessons from Pakui Sayang Park, Makassar

Nurfaida[1*], Nur Syahraeni[1], Novaty Eny Dungga[1], Tigin Dariati[1], and Muhammad Faried[1]

[1]Agrotechnology Study Program, Department of Agronomy, Faculty of Agriculture, Hasanuddin University, Makassar, Indonesia 90245; e-mail: nurfaida@agri.unhas.ac.id

ABSTRAK

Taman kota memainkan peran krusial dalam mendukung keseimbangan ekologi, meningkatkan kesejahteraan masyarakat, dan mewujudkan ruang inklusif di tengah pesatnya perkembangan kota. Penelitian ini bertujuan untuk merumuskan strategi pengelolaan lanskap berkelanjutan untuk Taman Pakui Sayang di Makassar, Indonesia, dengan mengintegrasikan aspek fisik, ekologis, manajerial, dan sosial. Dengan menggunakan pendekatan deskriptif kualitatif yang didukung oleh kerangka analisis SWOT (Strengths, Weaknesses, Opportunities, Threats), penelitian ini mengevaluasi infrastruktur taman, rutinitas pemeliharaan, efektivitas tenaga kerja, dan fitur inklusif melalui observasi lapangan, wawancara dengan pemangku kepentingan, serta analisis data sekunder. Hasil penelitian menunjukkan adanya tantangan pengelolaan yang signifikan, seperti keterbatasan tenaga kerja, pendanaan yang minim, pemeliharaan fasilitas yang tidak memadai, serta hambatan aksesibilitas bagi kelompok rentan. Meskipun demikian, lokasi strategis taman, keberagaman ekologis, dan keterlibatan masyarakat memberikan peluang besar untuk perbaikan. Analisis SWOT menempatkan taman ini dalam kuadran Strength-Opportunity, yang menunjukkan bahwa optimalisasi sumber daya yang ada dan pemanfaatan keunggulan eksternal dapat menjadi dasar intervensi yang efektif. Strategi utama yang diusulkan mencakup peningkatan rutinitas pemeliharaan, penguatan pengawasan manajerial, serta promosi inklusivitas melalui peningkatan infrastruktur. Penelitian ini menekankan pentingnya pengelolaan terpadu yang selaras dengan dimensi ekologi, sosial, dan ekonomi, serta menawarkan model yang dapat direplikasi untuk tata kelola taman kota berkelanjutan di konteks metropolitan serupa.

***Kata kunci*:** lanskap, manajemen, keberlanjutan, SWOT, taman kota

ABSTRACT

Urban parks play a critical role in supporting ecological balance, enhancing public well-being, and fostering inclusive spaces within rapidly developing cities. This study aims to formulate a sustainable landscape management strategy for Pakui Sayang Park in Makassar, Indonesia, by integrating physical, ecological, managerial, and social considerations. Utilizing a qualitative descriptive approach supported by a SWOT (Strengths, Weaknesses, Opportunities, Threats) framework, the research assesses the park's infrastructure, maintenance routines, labor effectiveness, and inclusive features through field observation, stakeholder interviews, and secondary data analysis. Results indicate significant management challenges, including limited workforce, underfunding, inadequate facility maintenance, and barriers to accessibility for vulnerable groups. Despite these issues, the park's strategic location, ecological diversity, and community engagement present considerable opportunities for improvement. The SWOT analysis places the park in the Strength-Opportunity quadrant, suggesting that optimizing existing resources and leveraging external advantages can guide effective interventions. Key strategies include improving maintenance routines, enhancing managerial supervision, and promoting inclusivity through infrastructure upgrades. This research underscores the importance of integrated management that aligns ecological, social, and economic dimensions, offering a replicable model for sustainable urban park governance in comparable metropolitan contexts.

***Keywords*:** landscape, management, sustainability, SWOT, urban park

Citation: Nurfaida, Syahraeni, N., Dungga, N. E., Dariati, T., dan Faried, M. (2026). Sustainable Landscape Management Strategies for Urban Parks: Lessons from Pakui Sayang Park, Makassar. Jurnal Ilmu Lingkungan, 24(1), 80-91, doi:10.14710/jil.24.1.80-91

1. INTRODUCTION

Rapid urbanization has become a defining feature of contemporary cities around the world, leading to increased demand for residential, commercial, and infrastructural development. This trend has resulted in a dramatic reduction in the availability of green open spaces (GOS), particularly in densely populated urban areas (Hu et al., 2024). Green spaces, especially city parks, play a crucial role in maintaining ecological balance, mitigating urban heat island effects, filtering

air pollutants, and supporting biodiversity (Paudel et al., 2023; Feng et al., 2024). In addition to these ecological benefits, urban parks contribute significantly to public health and social cohesion by providing spaces for recreation, physical activity, and social interaction (García et al., 2021).

Urban parks serve vital functions within city ecosystems by enhancing biodiversity and ecological balance, while mitigating environmental issues such as the urban heat island effect (Qin et al., 2024). They offer spaces for recreation and community gathering, supporting individual mental health and collective well-being (Wang, 2022; Lai et al., 2023; Cui et al., 2024). Parks also have educational potential through environmental workshops and exhibits, fostering greater public awareness of ecological issues (Lakićević et al., 2024). As carbon sinks, they help mitigate climate change impacts and improve urban air quality (Wu et al., 2023). Overall, these functions contribute to a more livable and resilient urban environment, improving the quality of life for residents (Zeng et al., 2023; Ahmad et al., 2022).

Despite these significant contributions, green spaces in many Indonesian cities continue to be undervalued, often seen as decorative elements or held in reserve for future construction (Hapsoro et al., 2024). This perception contributes to neglect, inadequate policy support, and insufficient funding for maintenance and development. City parks, a primary form of GOS, play a critical role in ensuring urban sustainability by addressing both ecological and social needs (Do et al., 2019). However, maintaining their multifunctionality requires a holistic management strategy that balances environmental integrity, economic viability, and community well-being (Cumming et al., 2020).

A major challenge in urban park sustainability lies in managing limited resources and competing land-use priorities. Poor maintenance can render parks unattractive, unsafe, and ineffective in serving their intended roles. Common problems include degraded facilities, labor shortages, and lack of accessibility for marginalized populations such as the elderly and people with disabilities. These issues are visible in many Indonesian urban parks, including Pakui Sayang Park in Makassar. Although centrally located and popular among residents, the park faces problems such as infrastructure wear, inadequate staffing, and irregular maintenance. A comprehensive evaluation of its current management is necessary to identify areas for improvement and ensure its long-term sustainability.

While frameworks for sustainable landscape management are available, many focus primarily on ecological indicators and overlook socio-economic dimensions. Urban contexts require integrated approaches that consider physical, biophysical, managerial, and social components. Strategic tools like SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis offer a structured method for assessing internal conditions and external influences to guide decision-making. Past research has emphasized the need for structured maintenance systems. Pertami et al. (2021), for instance, recommended standardized upkeep for both softscape and hardscape elements. Arifin & Arifin (2005) pointed to the importance of appropriate material selection and consistent maintenance schedules. Badrulhisham & Othman (2016) also underlined the role of proper vegetation pruning to maintain park aesthetics and safety.

Equally important is the issue of social inclusivity. Itair et al. (2023) advocated for smart technologies to enhance accessibility, especially for people with disabilities. Jennings & Bamkole (2019) emphasized how inclusive green spaces promote health and community cohesion. Yen et al. (2021) further supported this by demonstrating the positive impacts of physical activity in green environments on life satisfaction. Despite these valuable insights, there remains a lack of empirical studies that integrate these multiple dimensions, ecological, economic, and social, into actionable strategies tailored to specific parks, particularly in Indonesia.

This study aims to address that gap by developing a sustainable landscape management strategy for Pakui Sayang Park in Makassar City. Using a qualitative descriptive approach supported by SWOT analysis, this research assesses the park's physical, biophysical, managerial, and social conditions. The study's novelty lies in its integrative framework, which combines empirical field data with strategic tools to generate practical recommendations. By considering both internal factors and broader institutional contexts, the findings will contribute to advancing sustainable park management models in urban Indonesia and serve as a reference for similar contexts globally.

2. METHODOLOGY

2.1. Study Site

The research was conducted in Pakui Sayang Park, an urban green space located on Jalan Andi Pangeran Pettarani, Masale Subdistrict, Panakkukang District, Makassar City, South Sulawesi, Indonesia. The park covers approximately 1 hectare and lies at geographic coordinates 5°9'6.6132"S and 119°26'13.2936"E (Figure 1). This site was selected due to its strategic location in a dense urban setting, adjacent to government offices and residential areas, which makes it a vital hub for public activities such as sports, recreation, and social interaction. The park features a range of facilities, including sports fields, jogging tracks, children's play areas, and various amenities for public convenience. Its accessibility and multifunctional use highlight its importance as a case study for sustainable park management.

2.2. Research Design

This study used a qualitative descriptive approach supported by SWOT analysis to develop a sustainable management strategy for Pakui Sayang Park. The

research was conducted in three stages: (1) field data collection, (2) descriptive analysis, and (3) SWOT-based strategy formulation. This mixed-methods framework enabled a comprehensive assessment of the park's physical, biophysical, managerial, and social conditions by integrating field observations and stakeholder input.

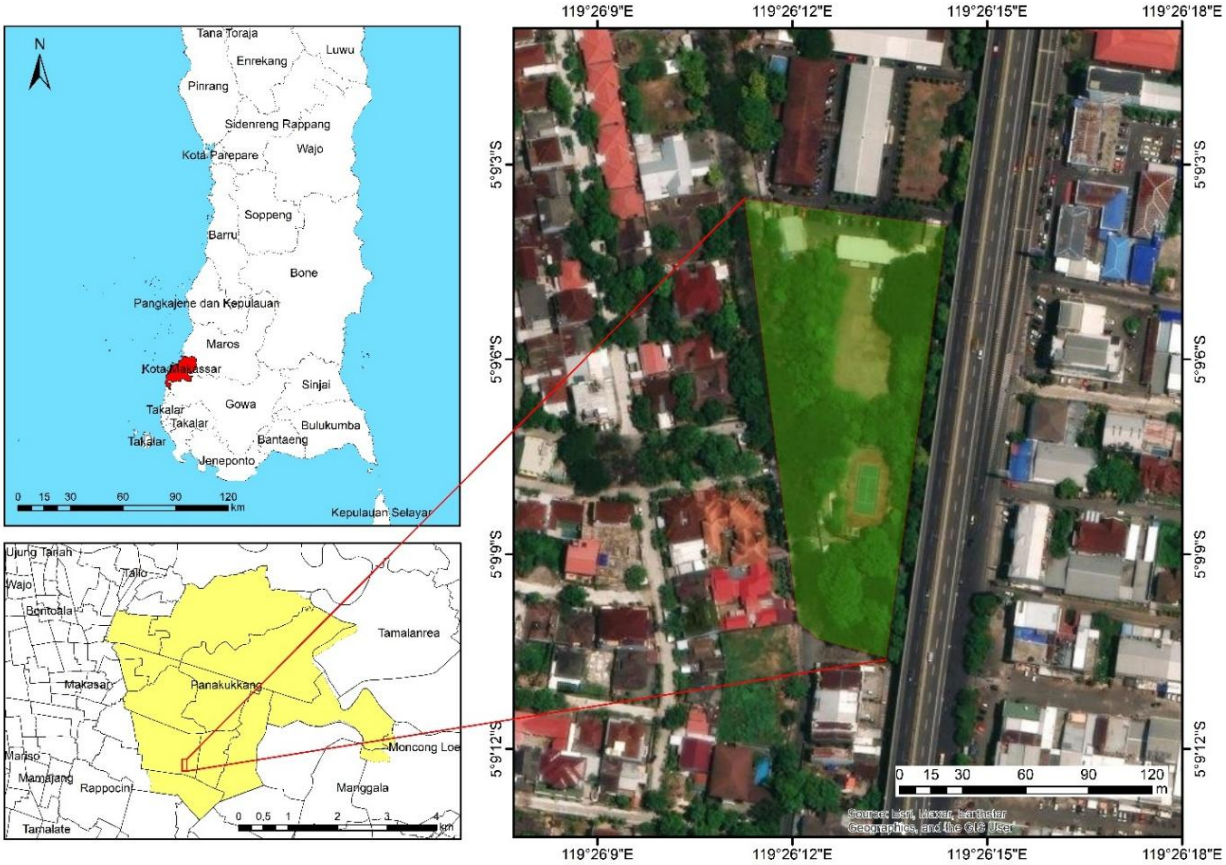

Figure 1. Research Location

2.3. Data Collection

Primary data were gathered through systematic field observations and semi-structured interviews. Observations covered infrastructure conditions, vegetation health, cleanliness, accessibility, and circulation. Focus areas included maintenance needs and operational effectiveness. Interviews were conducted with a total of four key informants, consisting of one park manager, two staff members, and one representative from an inclusive group addressed maintenance routines, labor distribution, management practices, and perceived challenges. In addition, a questionnaire survey was administered to 73 visitors. Data on task frequency and tool availability were also collected to assess maintenance efficiency. Secondary data were sourced from academic literature, government policies, and official documents related to park management. Key references included minimum wage standards, municipal planning regulations, and national green space guidelines, serving as benchmarks for sustainability evaluation.

Data were qualitatively analyzed to provide a holistic overview of the park. Analysis categories included infrastructure, vegetation, social use, economic aspects, and management practices. Physical evaluations assessed the state of facilities (e.g., paths, playgrounds), while biophysical analysis focused on plant health indicators. Social aspects were examined through inclusive features like ramps and seating, while economic review compared labor costs with local wage standards.

Labor effectiveness was quantitatively evaluated by comparing actual maintenance output to ideal benchmarks based on existing literature (Arifin & Arifin, 2005). The effectiveness metric was calculated by dividing the actual work capacity of maintenance staff by the ideal capacity for key activities such as sweeping, watering, and pruning. The goal was to identify gaps in human resource allocation and performance, which are critical for determining operational sustainability.

2.4. SWOT Analysis

A SWOT analysis was used to evaluate internal and external factors influencing park management. This involved identifying strengths, weaknesses, opportunities, and threats through descriptive analysis and stakeholder interviews. Each factor was assigned to weight (reflecting its importance) and a rating (indicating performance), following scoring

methods adapted from Rangkuti (2006) and Wardoyo (2011). The weighted scores were then compiled into Internal and External Factor Evaluation matrices (IFAS and EFAS) and plotted onto a SWOT matrix to determine the park's strategic positioning. This process guided the development of prioritized management strategies based on the resulting quadrant classification.

3. RESULTS AND DISCUSSION

3.1. Physical and biophysical characteristics

Pakui Sayang Park, encompassing approximately one hectare, exhibits a diverse range of physical and biophysical attributes that reflect both its urban ecological significance and the challenges it faces in sustainable management. Located centrally in Makassar City and bordered by residential and governmental buildings, the park benefits from high visitor accessibility and frequency. The main facilities include a jogging track, sports courts (tennis and fitness areas), climbing walls, reflexology path, and a children's playground. Support amenities such as benches, trash bins, washbasins, toilets, an ATM center, canteen, parking area, and a security post are also present.

Despite the comprehensive infrastructure, numerous physical facilities exhibit signs of deterioration (Figure 2). Observations revealed that the grass block area is overgrown with weeds and tall grass, some gym equipment is rusted, the reflexology stones are slippery with moss, and several playground elements, such as slides, are damaged. The tennis court gate and washbasins are partially non-functional, and toilets designed for wheelchair users have been repurposed for storage. The parking space, approximately 993 m^2, is insufficient during peak visitor times, causing overflow into adjacent government office areas. The utility infrastructure includes an electricity grid managed by PLN (State Electricity Company of Indonesia) and clean water supply provided by PDAM (Regional Drinking Water Company), though park maintenance relies on groundwater wells. The park uses an open drainage system that follows the jogging track, and its internal circulation is facilitated through a 2.9-meter-wide pedestrian path made from non-slip paving blocks.

Pakui Sayang Park hosts 27 types of vegetation, including grass, shrubs, bushes, and trees (Table 1). Several plant species exhibit signs of leaf desiccation and curling, indicating noticeable physiological stress. These symptoms were predominantly observed in ornamental herbaceous plants, particularly *Canna indica* L. and *Iris pseudacorus*, which showed more frequent and severe leaf damage compared to other vegetation types. In contrast, grasses and mature trees appeared relatively less affected. These conditions are presumed to be associated with water deficiency (Ai & Lenak, 2014) or nutrient imbalances, particularly potassium deficiency (Attia et al., 2022; Marathe et al., 2016). In addition, leaf edge damage was observed, which is likely due to pest activity. Some plants also require pruning due to excessive canopy density.

Poor routine maintenance has led to facility degradation, posing potential safety hazards and reducing the park's visual and functional appeal. High-risk hazards were identified in the reflexology path, where stones are covered with moss and become slippery, increasing the risk of falls, and in damaged playground equipment, particularly slides, which may cause injury to children. The climbing wall and tennis court also exhibit structural and surface deterioration that may compromise user safety. In addition, several facilities show moderate deterioration, including rusted outdoor gym equipment and non-functional washbasins, which reduce usability and may pose minor safety risks. The disability-accessible toilet has been repurposed for storage, limiting accessibility and raising sanitation concerns. These findings indicate that recreational infrastructure and accessibility-related facilities should be prioritized for immediate maintenance and rehabilitation. okeThis mirrors broader challenges in urban park management, where neglect in regular upkeep jeopardizes the sustainability of green spaces. Shifting towards preventive maintenance would extend infrastructure lifespan and reduce operational disruptions. This requires better workforce deployment, defined task schedules, and continuous evaluation. According to Badrulhisham and Othman (2016), routine pruning and plant care contribute not only to ecological balance but also to safety and visibility. Environmental factors, such as soil type, water availability, and microclimate, also influence plant health and diversity (Xu et al., 2024; English et al., 2022). Management strategies that incorporate green infrastructure and sustainable landscaping can optimize plant conditions and resource use (Yaacob, 2024). Regular monitoring can further ensure timely responses to declining plant health, allowing for targeted interventions such as replanting or care adjustments (Honcharenko et al., 2024). Effective Park design must also prioritize user needs through accessible facilities like restrooms, seating, and recreational zones. These features not only enhance comfort but also increase area capacity and promote social cohesion (Cheng et al., 2022; Li et al., 2023; Dai et al., 2022; Yang et al., 2021; Falih et al., 2025).

Figure 2. Utilities Requiring Maintenance

Table 1. Vegetation Species

No.	Species	Growth Form	Species	Growth Form	Species	Growth Form	Species	Growth Form
1.	*Streblus asper*	Tree	*Saraca asoca*	Shrub	*Iris pseudacorus*	Bush	*Pennisetum purpureum* cv. Mott	Grass
2.	*Maranthes corymbosa*	Tree	*Bougainvillea* sp.	Shrub				
3.	*Araucaria heterophylla*	Tree	*Canna indica* L.	Shrub				
4.	*Casuarina equisetifolia*	Tree	*Cordyline fruticosa*	Shrub				
5.	*Terminalia mantaly*	Tree	*Heliconia psittacorum*	Shrub				
6.	*Hyophorbe lagenicaulis*	Tree	*Jatropha curcas*	Shrub				
7.	*Veitchia merillii*	Tree	*Calathea* sp	Shrub				
8.	*Cordyline australis*	Tree	*Hibiscus rosa-sinensis* L.	Shrub				
9.	*Terminalia catappa*	Tree	*Polyscias scutellaria*	Shrub				
10.	*Mangifera indica*	Tree	*Syzygium paniculatum*	Shrub				
11.	*Gnetum gnemon*	Tree	*Codiaeum variegatum*	Shrub				
12.	*Streblus asper*	Tree	*Pedilanthus tithymaloides*	Shrub				
13.	*Samanea saman*	Tree						

3.2. Social Function and Inclusivity

Pakui Sayang Park serves various social functions, as reflected in the diverse activities conducted by visitors. Field observations and questionnaire responses indicated that the park is actively used for physical activities such as jogging, aerobics, and informal sports, particularly during weekends and peak hours. The jogging track and open spaces were the most frequently utilized facilities, supporting both individual exercise and group-based activities (Figure 3). In addition, seating areas and shaded zones were used for relaxation and social interaction among visitors, including families and community groups.

Despite the active use of the park, observations revealed relatively low awareness of cleanliness among visitors. Littering behavior was observed in several areas, including the jogging track, seating zones, and green spaces, where waste was not always

disposed of in the provided trash bins. This indicates that user behavior contributes to cleanliness issues and affects the overall environmental quality of the park. Such conditions highlight the need for improved visitor awareness and more effective waste management strategies as part of sustainable park management.

Although Pakui Sayang Park caters to diverse visitors, it lacks infrastructure that supports inclusivity. Facilities for people with disabilities and the elderly, such as guiding blocks, accessible seating, and barrier-free paths, are absent, limiting its function as an inclusive public space. Public parks should serve as equitable gathering places that support engagement across demographics (Skaržauskienė & Mačiulienė, 2019). As urban planning increasingly embraces inclusive design, it is critical to integrate accessibility features that ensure equitable park experiences for all users (Itair et al., 2023). Strategically, this necessitates investments in infrastructure that meet universal design standards. Pamungkas et al. (2025) found that shaded seating, greenery, and engaging features it very important in urban park design. Furthermore, participatory design and management approaches enhance community ownership and foster vibrant, inclusive spaces (Moussaoui, 2023; Treija et al., 2023). Inclusive urban parks must consider the needs of marginalized groups, including the elderly and people with disabilities, through deliberate planning (Onose et al., 2020; Tigere & Moyo, 2021). Initiatives like urban agriculture within parks not only address food security but also create avenues for participation and social bonding (Estrada et al., 2020; Cvejić et al., 2015).

3.3. Ideal and Actual Maintenance Conditions

Pakui Sayang Park exhibits a simplistic spatial design that eases maintenance (Table 2). Material selection, such as ceramic tiles for benches and non-slip paving, reflects durability and usability considerations. The color scheme of bright yellows, greens, and reds adds vibrancy to the space. Nonetheless, discrepancies between ideal and actual maintenance practices were evident. Maintenance of vegetation is inconsistent, with watering conducted 2-3 times weekly in dry seasons and once weekly during rainy periods. Tools used include a ¾ -inch hose, lawnmowers, pruning shears, and saws. Pruning is carried out only on an ad hoc basis. Replanting and fertilization, including follow-up fertilization necessary for plant health, are outsourced to contractors rather than performed by daily staff. Hard material maintenance includes daily cleaning by two staff members using basic cleaning tools. However, activities like moss removal, repainting, and repairs are infrequent and appear to be reactive rather than preventive, leading to unsafe and unsightly conditions.

Figure 3. Aerobics and Jogging Activities on Weekends

Table 2. Summary of Park Maintenance Activities, Tools, and Workforce Requirements

No.	Maintenance Activity	Frequency of Maintenance Time	Maintenance Tools	Number of Workers (persons)
Soft Material (Vegetation)				
1	Watering	• Dry Season: 2–3 times/week • Rainy Season: once/week	¾ -inch hose	2
2	Pruning			
	• Grass	Once/month	Push and backpack grass cutter	1
	• Shrubs and Trees	Incidental	Pruning shears, branch shears, hand saw, chainsaw	1
3	Replanting and Replacing Plants	Incidental	-	Contractor
4	Fertilization	Primer fertilization	-	Contractor
Hard Material				
1	Park Area Cleaning	Daily	Broomstick, fiber broom, dustpan, garbage carrier motorbike	2
2	Moss and Rust Removal	Incidental		
3	Painting	Incidental		Contractor
4	Repair and Replacement of Damaged Facilities	Incidental		Contractor

3.4. Labor Resources and Work Effectiveness

Based on the labor performance evaluation, the effectiveness of maintenance activities in Pakui Sayang Park varied across tasks (Table 3). Sweeping on paved surfaces covered an area of 753 m^2 with two workers, resulting in an actual work capacity of 376.5 m^2 per hour compared to the ideal 800 m^2, giving an effectiveness rate of 47.1%. Similarly, sweeping grass areas of 363 m^2 by two workers yielded an actual capacity of 181.5 m^2 per hour, below the ideal 400 m^2, with an effectiveness of 45.4%. Watering activities using a ¾ inch hose on a 132 m^2 area achieved only 66 m^2 per hour by two workers, whereas the ideal target was 150 m^2, resulting in an effectiveness of 44%. Grass cutting using a shoulder-mounted mower was more efficient, with one worker covering the entire 132 m^2 area, achieving 52.8% effectiveness against an ideal 250 m^2. Meanwhile, pruning three shrubs or trees by a single worker yielded 60% effectiveness, based on an ideal target of five trees. These findings indicate that actual field performance consistently underperforms relative to expected standards, with effectiveness values ranging from 44% to 60% across maintenance activities. This gap reflects not only technical inefficiencies but also structural limitations in labor management within the study area. The limited number of workers, with only two personnel responsible for multiple maintenance tasks, leads to workload overlap and reduces task-specific efficiency. As a result, activities such as sweeping, watering, and pruning cannot be performed optimally within the expected time frame.

In addition, the absence of a structured maintenance schedule and reliance on incidental practices further contribute to inconsistent performance outcomes. This condition is comparable to findings in other occupational settings, where inadequate workforce allocation, lack of task specialization, and poor organizational support have been associated with declines in productivity. Implementing structured human resource strategies, including workplace health promotion, job rotation, and continuous training, has been shown to improve worker engagement and efficiency (Jimoh et al., 2023; Jackson et al., 2023; Kjærgaard et al., 2024).

Therefore, enhancing labor productivity in park maintenance requires not only operational adjustments, such as increasing the number of workers and improving task distribution, but also strategic investments in employee well-being, safety protocols, and organizational support systems to ensure sustainable performance improvements.

This underperformance may be linked not only to technical factors but also to broader labor management issues. Effective labor management requires a comprehensive strategy that integrates worker health, safety, and a supportive working environment (Minakawa et al., 2023; Širok et al., 2022). Poor health and inadequate support systems have been associated with declines in productivity, as seen in various occupational settings. Implementing structured human resource strategies, including workplace health promotion, job rotation, and continuous training, has been shown to improve worker engagement and efficiency (Jimoh et al., 2023; Jackson et al., 2023; Kjærgaard et al., 2024). Thus, enhancing labor productivity in park maintenance may necessitate not only operational adjustments but also strategic investments in employee well-being, safety protocols, and organizational support frameworks.

3.5. Economic Aspects of Park Management

The operational funding for the management of Pakui Sayang Park is sourced from the Provincial Government of South Sulawesi, with an annual budget allocation of approximately IDR 200,000,000; However, the disbursement of this budget is based on specific proposals submitted by park management, rather than a fixed and automatically distributed annual operational fund. As a result, the timing and utilization of the budget depend on administrative approval processes.

This funding is primarily used for procuring maintenance equipment, supporting infrastructure repairs, and partially covering labor-related expenses. Despite being allocated annually, the budget appears insufficient to meet the park's overall operational needs, particularly in terms of routine maintenance and adequate labor compensation. This limitation may be associated with broader budget constraints, prioritization of funding at the provincial level, or inefficiencies in financial planning and allocation mechanisms.

Maintenance workers at Pakui Sayang Park receive a monthly wage of IDR 2,000,000, with daily working hours from 08:00 to 18:00 Central Indonesia Time. When compared to the 2025 regional minimum wage for Makassar City, set at IDR 3,880,136.87 per month under the Governor's Decree, the current wage falls significantly below the mandated standard. This disparity indicates that the remuneration does not yet meet the welfare threshold for labor standards. Therefore, it is recommended that worker compensation be adjusted to align with the official regional minimum wage of Makassar City.

Table 3. Work Effectiveness of Park Maintenance Activities

No.	Type of Activity	Area Observed	Number of Workers	Work Capacity/hour		Work Effectiveness (%)
				Actual	Ideal	
1	Sweeping Paved Surfaces	753 m^2	2	376.5 m^2	800 m^2	47.1
2	Sweeping Grass Areas	363 m^2	2	181.5 m^2	400 m^2	45.4
3	Watering with ¾-inch Hose	132 m^2	2	66 m^2	150 m^2	44.0
4	Grass Trimming with Shoulder Mower	132 m^2	1	132 m^2	250 m^2	52.8
5	Pruning Shrubs and Trees	3 trees	1	3 trees	5 trees	60.0

Salary significantly influences work effectiveness through its impact on employee satisfaction and motivation. Higher compensation generally leads to increased job satisfaction, which can promote a more engaged and productive workforce. This makes salary a crucial factor in ensuring job satisfaction and, consequently, overall organizational effectiveness (Schyff et al., 2018; Hoang et al., 2020). For instance, studies have shown that when employees perceive their pay as fair and commensurate with their efforts, their motivation and commitment to the organization improve, which can lead to higher performance levels Chatzoglou et al., 2024).

Financial constraints pose a significant challenge to long-term park sustainability. Pakui Sayang Park currently operates on a proposal-based funding model, leading to irregular maintenance schedules and poor financial planning. This reflects one of the threats identified in the SWOT analysis. Inadequate budgeting impacts quality, usability, and public satisfaction associated with urban parks (Ahmad et al., 2022). Without consistent funding, parks suffer from facility degradation, inadequate amenities, and increased vandalism (Wang et al., 2021). Institutionalizing annual budget allocations would enable more reliable planning and operational consistency. Additionally, introducing revenue-generating amenities such as vending zones or community events could supplement limited public funds while preserving the park's public nature. Investment in quality infrastructure, like restrooms, seating, and recreational features, also correlates with higher utilization and visitor satisfaction (Yang et al. 2021; Suhardono et al., 2024). Adequate funding further supports biodiversity preservation, ecological health, and community engagement (Amraotkar et al., 2023). Moreover, strategic budgeting enhances opportunities for education and awareness campaigns, fostering environmental stewardship among park users (Cai et al., 2021; Zhang et al., 2024).

3.6. SWOT analysis

Based on the descriptively analyzed data, the results were utilized to identify internal and external factors for the SWOT analysis. Internal factors were determined by examining the strengths and weaknesses in the management of Pakui Sayang Park, while external factors were identified by recognizing opportunities and threats that may influence park management. In total, eleven internal factors (Internal Factors/IF) were identified, comprising five strengths and six weaknesses. The strengths of Pakui Sayang Park include: (1) the availability of various sports facilities that attract visitors (S1), (2) daily cleaning of the park area (S2), (3) sufficient maintenance equipment (S3), (4) ease in conducting ideal maintenance activities (S4), and (5) routine inspection and evaluation of park conditions by field supervisors (S5). Conversely, the identified weaknesses include: (1) suboptimal vegetation maintenance (W1), (2) insufficient number of maintenance workers (W2), (3) wages below the regional minimum wage (W3), (4) lack of safety for elderly individuals and persons with disabilities (W4), (5) poor condition of several facilities (W5), and (6) limited availability of supporting amenities (W6). In addition, seven external factors (External Factors/EF) were identified, consisting of four opportunities and three threats. The opportunities include: (1) a strategic location (O1), (2) a park environment that is safe from criminal acts and vandalism (O2), (3) its status as one of the designated green open spaces in Makassar City (O3), and (4) high intensity of park visitors (O4). Meanwhile, the identified threats comprise: (1) low visitor awareness of cleanliness (T1), (2) the park has not yet met the criteria for inclusivity (T2), and (3) irregular government funding (T3).

Each factor was assigned to a weight and rating, producing cumulative scores of 3.08 for strengths and -2.06 for weaknesses. Similarly, opportunities scored 3.28 and threats -2.19. These results were used to generate IFAS and EFAS matrices and plotted on a SWOT diagram to determine the strategic quadrant. The park falls into the Strength-Opportunity (SO) quadrant, indicating that management should capitalize on internal strengths to seize external opportunities. With the highest computed area (10.10), the SO quadrant emerged as the top strategic priority, followed by the ST (6.76), WO (6.75), and WT (4.51) quadrants. The findings of this study place Pakui Sayang Park within the Strength-Opportunity (SO) quadrant of the SWOT framework, suggesting a favorable strategic position in which internal capabilities can be mobilized to capitalize on external prospects. As emphasized by Rangkuti (2006), this quadrant represents the most advantageous scenario for proactive strategy implementation. The strategies identified under this orientation include preserving physical facilities, enhancing managerial oversight through proximity to government offices, and optimizing the use of available maintenance tools. This strategic direction aligns with sustainable landscape management principles, which advocate for harmonizing ecological functions with administrative feasibility and public utility (Yang et al., 2023; Yuan et al., 2025; Amraotkar et al., 2023). By leveraging existing assets, especially infrastructure and management routines, the park can enhance its operational effectiveness without the need for extensive redevelopment. Based on the SWOT positioning, the following SO strategies are prioritized below (Table 4).

Building on the SWOT analysis, this study outlines several strategic directions to improve the sustainability, inclusivity, and functionality of Pakui Sayang Park. Key actions include optimizing sports and recreational facilities, preventing vandalism through enhanced security measures, and leveraging the park's proximity to government offices by conducting routine inspections to improve administrative responsiveness. Maintenance resources, particularly cleaning tools,

should be fully utilized to support continuous operation as a vital green public space.

To address current weaknesses and expand the park's reach, additional inclusive infrastructure, such as guiding blocks, accessible seating, and barrier-free routes, should be developed to ensure safety and comfort for elderly visitors and people with disabilities. Increasing the number of maintenance staff is necessary for managing vegetation and facilities more effectively. Based on the comparison between actual and ideal work capacity presented in Table 3, the current workforce achieves only approximately 44–60% of the expected performance standards. This indicates a significant gap between existing labor capacity and operational requirements. Using a proportional estimation approach, the current number of workers (2 persons) would need to be increased to approximately 3–4 workers to achieve optimal maintenance performance, assuming similar working conditions and task distribution. This estimation reflects the impact of workload overlap, where a limited number of workers are responsible for multiple maintenance activities simultaneously. Increasing the number of maintenance staff would allow better task specialization, reduce workload pressure, and improve overall efficiency and effectiveness of park management. Field observations indicated high visitor activity, particularly during peak periods, suggesting increased demand for supporting facilities. In addition, several existing facilities were found to be damaged or not functioning optimally, which may limit their usability. These conditions indicate the need for improved and additional supporting amenities to enhance comfort and overall park functionality. Furthermore, repairing and protecting damaged infrastructure and adding supplementary features such as storage lockers and rest areas will enhance user experience and satisfaction.

Strategies must also be developed to overcome threats related to sanitation and operational sustainability. Improving waste collection, optimizing cleaning routines, and ensuring adequate labor and equipment are essential steps. Regular evaluations should guide timely and well-structured budget proposals to local authorities, with a focus on securing institutional support for an annualized funding model. Wages for park staff must align with Makassar's regional minimum wage, and proposals should be submitted formally to adjust compensation accordingly. To reduce dependence on public funding, introducing limited revenue-generating activities, such as designated vendor stalls or small-scale community events, can supplement the park's operational budget without compromising its public character.

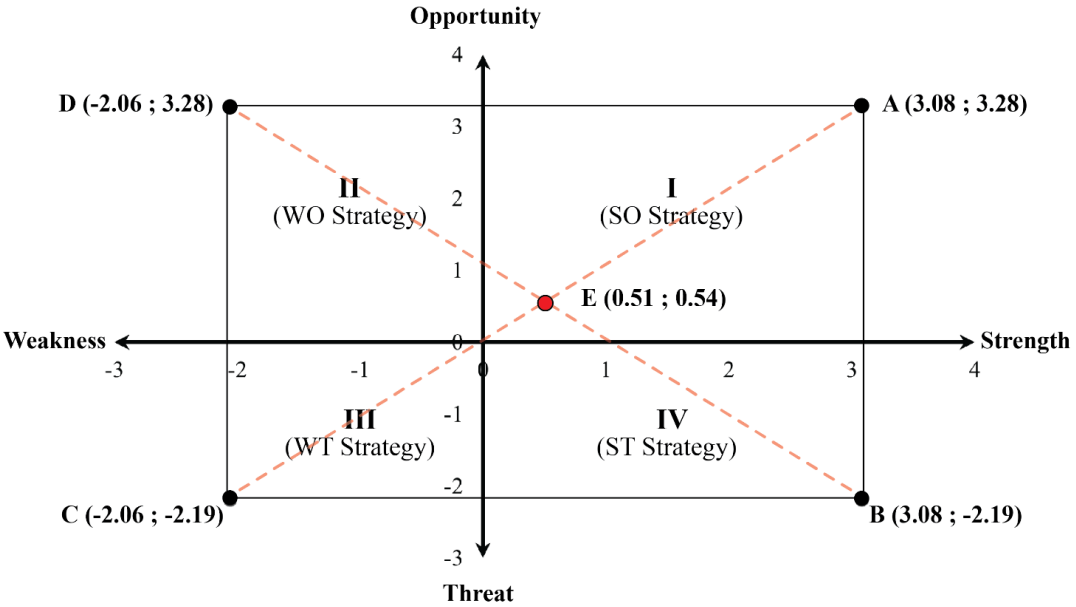

Figure 4. SWOT Diagram

Table 4. SWOT matrix

Strengths (S)	Weaknesses (W)
S1. Availability of various sports facilities that can attract visitor interest	W1. Suboptimal vegetation maintenance
S2. Daily cleaning of the park area	W2. Insufficient number of maintenance workers
S3. Adequate maintenance tools	W3. Wages below the Regional Minimum Wage (UMR)
S4. Ease in performing ideal maintenance routines	W4. Lack of safety for the elderly and people with disabilities
S5. Field supervisors routinely conduct inspections and evaluations of park conditions	W5. Some facilities are in poor condition
	W6. Limited availability of supporting amenities
Opportunities (O)	Threats (T)
O1. Strategic location	T1. Low visitor awareness of cleanliness
O2. Safe from crime and vandalism	T2. The park does not yet meet inclusive criteria
O3. One of the designated green open spaces in Makassar City	T3. Irregular government funding

In addition to these practical actions, the strategic management of the park should integrate ecological, economic, and social objectives in a unified sustainability framework. Inspired by the model of Cumming and Epstein (2020), this involves viewing the park not just as a recreational space, but as an ecological asset and a social hub. Ecological strategies include adopting native plants, minimizing maintenance footprints through organic methods, and utilizing nature-based solutions (NBS) to enhance urban biodiversity and mitigate climate impacts (Spagnoli & Mundula, 2021; Zhao et al., 2024). Economically, efficient labor allocation, fair compensation, and cost-effective maintenance practices should be prioritized. Socially, parks must be inclusive, accessible, and aligned with community needs.

Community participation plays a central role in this approach, also monitoring and evaluating (Hamit et al., 2025). Involving residents in planning and decision-making fosters greater stewardship and ensures that park features reflect public priorities (Jahrl et al., 2022; Shams & Barker, 2019). Integrating green infrastructure elements, such as sustainable drainage systems and community gardens, can also enhance resilience to climate-related challenges and encourage social interaction (Feldman et al., 2019; Pandey & Ghosh, 2023). Ultimately, aligning ecological stewardship with inclusive governance and economic pragmatism will allow Pakui Sayang Park to serve as a model for sustainable urban green space management, balancing environmental integrity, financial sustainability, and community well-being (Nguyen & Orange, 2023).

4. CONCLUSION

This study has demonstrated that Pakui Sayang Park, while strategically located and ecologically diverse, faces several challenges in achieving sustainable urban park management, including suboptimal maintenance practices, labor inefficiencies, limited accessibility, and irregular funding. Through a comprehensive SWOT analysis, the study identified a strategic orientation within the Strength-Opportunity (SO) quadrant, emphasizing the importance of leveraging existing assets, such as infrastructure, strategic location, and managerial routines, to exploit external opportunities like high user engagement and public safety. These findings highlight the potential for targeted, resource-efficient strategies to significantly improve park functionality and inclusivity. Moreover, the integration of ecological, social, and economic considerations reinforces the value of adopting a holistic framework in urban landscape management. This research contributes to the existing body of knowledge by offering a site-specific yet scalable approach for evaluating and planning sustainable interventions in public green spaces, particularly in the context of Indonesian cities. This study has several limitations that should be acknowledged. First, the assessment of facility conditions and vegetation stress was primarily based on direct field observations, which may involve a degree of subjectivity. Second, the analysis of work effectiveness was based on a very limited number of maintenance workers (only two individuals), which may not fully represent optimal labor conditions and could influence the accuracy of the effectiveness estimation. Third, the study was conducted within a specific time frame and location, limiting the generalizability of the findings to other urban park contexts. Future studies should consider comparative or longitudinal methodologies to explore implementation outcomes and further refine strategic models for diverse urban contexts.

REFERENCES

Ahmad, S., Z. Ayob, N. Hussain, and N. Nayan. 2022. Assessment of Landscape Maintenance Towards Cost Planning: Expert Validation on the Criteria of Sustainable Landscape Maintenance for Public Park. *Planning Malaysia*, 20.

Ai, N.S., and A.A. Lenak. 2014. Penggulungan Daun pada Tanaman Monokotil Saat Kekurangan Air. *Jurnal Bios Logos*, 2(4).

Amraotkar, S., and D. Gangopadhyay. 2023. Assessing User Satisfaction of Urban Parks for Sustainable Cities: A Pilot Study of Two Urban Parks in Chennai, India. *IOP Conference Series: Earth and Environmental Science*, 1210(1): 012039.

Arifin, H.S., and N.H.S. Arifin. 2005. Pemeliharaan Taman. Jakarta: Penebar Swadaya.

Attia, H., F. Rebah, C. Ouhibi, M.A. Saleh, A.T. Althobaiti, K.H. Alamer, M. Ben Nasri, and M. Lachaâl. 2022. Effect of Potassium Deficiency on Physiological Responses and Anatomical Structure of Basil, *Ocimum basilicum* L. *Biology*, 11(11).

Badrulhisham, N., and N. Othman. 2016. Knowledge in Tree Pruning for Sustainable Practices in Urban Setting: Improving Our Quality of Life. In Abbas, M.Y., and S.K.S.O. Thani (Eds.), AMER International Conference on Quality of Life. Procedia – Social and Behavioral Sciences.

Cai, M., C. Cui, L. Lin, S. Di, Z. Zhao, and Y. Wang. 2021. Residents' Spatial Preference for Urban Forest Park Route During Physical Activities. *International Journal of Environmental Research and Public Health*, 18(22): 11756.

Chatzoglou, P., A. Diamantidis, and A. Karras. 2024. Unveiling Employee Motivating Factors During Economic Crisis Periods: A Structural Approach. *Journal of Occupational and Organizational Psychology*, 97(3): 1148–1165.

Cheng, S., Z. Zhai, W. Sun, Y. Wang, R. Yu, and X. Ge. 2022. Research on the Satisfaction of Beijing Waterfront Green Space Landscape Based on Social Media Data. *Land*, 11(10): 1849.

Cui, T., Y. Ye, Y. Zhuang, Q. Lin, M. Yan, L. Zhang, and L. Zhu. 2024. A Study of the Changing Characteristics and Influencing Factors of Holiday Visitor Vitality in Urban Parks: The Case of Fuzhou, China. *PLOS ONE*, 19(12): e0311546.

Cumming, G.S., and G. Epstein. 2020. Landscape Sustainability and the Landscape Ecology of

Institutions. *Landscape Ecology*, 35(11): 2613–2628.

Cvejić, R., Š. Železnikar, M. Nastran, V. Rehberger, and M. Pintar. 2015. Urban Agriculture as a Tool for Facilitated Urban Greening of Sites in Transition: A Case Study. *Urbani Izziv*, 26.

Dai, D., M. Bo, and Y. Zhou. 2022. How Do the Young Perceive Urban Parks? A Study on Young Adults' Landscape Preferences and Health Benefits in Urban Parks Based on the Landscape Perception Model. International *Journal of Environmental Research and Public Health*, 19(22): 14736.

Do, D.T., Y. Cheng, A. Shojai, and Y. Chen. 2019. Public Park Behaviour in Da Nang: An Investigation into How Open Space is Used. *Frontiers of Architectural Research*, 8(4): 454–470.

Elamir, E. 2020. Determinant Indicators for Labor Market Efficiency and Higher Education and Training: Evidence from Middle East and North Africa Countries. *Problems and Perspectives in Management,* 18(1): 206–218.

English, J., K. Barry, E. Wood, and A. Wright. 2022. The Effect of Urban Environments on the Diversity of Plants in Unmanaged Grasslands in Los Angeles, United States. *Frontiers in Ecology and Evolution*, 10.

Estrada, M., P. Kotsila, K. Hörschelmann, Y. Lazova, and A. Werner. 2020. Ensuring Citizenship Rights: Cooperation and Tensions in the Governance of Urban Community Gardens. *IOP Conference Series: Earth and Environmental Science*, 588(5): 052003.

Falih, G.M., L.W. Santosa, R. Harini. 2025. Analisis Kesesuaian dan Daya Dukung Ekowisata Mangrove Telok Bediri, Kabupaten Kubu Raya, Kalimantan Barat. *Jurnal Ilmu Lingkungan*, 23(2): 347-358

Feldman, A., R. Foti, and F. Montalto. 2019. Green Infrastructure Implementation in Urban Parks for Stormwater Management. *Journal of Sustainable Water in the Built Environment*, 5(3).

Feng, L., J. Wang, B. Liu, F. Hu, X. Hong, and W. Wang. 2024. Does Urban Green Space Pattern Affect Green Space Noise Reduction? *Forests*, 15(10): 1719.

García de Jalón, S., A. Chiabai, S. Quiroga, C. Suárez, M. Ščasný, V. Máca, I. Zvěřinová, S. Marques, D. Craveiro, and T. Taylor. 2021. The Influence of Urban Greenspaces on People's Physical Activity: A Population-Based Study in Spain. *Landscape and Urban Planning*, 215: 104229.

Hamit, L.S., I.G. Mahardika, and I.N. Rai. 2025. Analisis Keberlanjutan dan Strategi Pengelolaan Ekosistem Mangrove di Kawasan Ekonomi Khusus Mandalika Kabupaten Lombok Tengah. *Jurnal Ilmu Lingkungan*, 23(3): 585-596

Hapsoro, N.A., S. Triyadi, and M.D. Koerniawan. 2024. The Effect of the Existence of Sustainable Green Open Space on the Community's Economy in Big Cities. *Journal of Architectural Design, Engineering, and Science*, 1(1).

Hoang, L., H. Vu, and V. Ngo. 2020. Factors Affecting Job Pursuit Intention in Hotel Industry in Ho Chi Minh, Viet Nam. *Journal of Asian Finance Economics and Business*, 7(11): 281–290.

Honcharenko, Y., U. Sokolenko, N. Oleksiichenko, and A. Sokolnyk. 2024. Assessment of Recreational Activities and Greening of Urban Parks in Kharkiv. *IOP Conference Series: Earth and Environmental Science*, 1376(1): 012002.

Hu, J., F. Zhang, B. Qiu, X. Zhang, Z. Yu, Y. Mao, C. Wang, and J. Zhang. 2024. Green-Gray Imbalance: Rapid Urbanization Reduces the Probability of Green Space Exposure in Early 21st Century China. *Science of The Total Environment*, 933: 173168.

Itair, M., I. Shahrour, and I. Hijazi. 2023. The Use of Smart Technology for Creating an Inclusive Urban Public Space. *Smart Cities*, 6(5): 2484–2498.

Jackson, J., M. Sund, G. Lobos, L. Melin, and S. Mathiassen. 2023. Assessing the Efficacy of a Job Rotation for Improving Occupational Physical and Psychosocial Work Environment, Musculoskeletal Health, Social Equality, Production Quality and Resilience at a Commercial Laundromat: Protocol for a Longitudinal Case Study. *BMJ Open*, 13(5): e067633.

Jahrl, I., O. Ejderyan, and J. Cavin. 2022. Community Gardens as a Response to the Contradictions of Sustainable Urban Policy: Insights from the Swiss Cities of Zurich and Lausanne. *Frontiers in Sustainable Food Systems*, 6.

Jennings, V., and O. Bamkole. 2019. The Relationship Between Social Cohesion and Urban Green Space: An Avenue for Health Promotion. *International Journal of Environmental Research and Public Health*, 16(3): 452.

Jimoh, R., K. Ihedigbo, and L. Oyewobi. 2023. Influence of Human Resources Management Practices on Organisational Performance of Construction Firms in Lagos State – Nigeria. *International Journal of Sustainable Construction Engineering Technology*, 14(4).

Kjærgaard, A., E. Rudolf, J. Palmqvist, M. Jakobsen, and J. Ajslev. 2024. The Psychosocial Hierarchy of Controls: Effectively Reducing Psychosocial Hazards at Work. *American Journal of Industrial Medicine*, 68(3): 250–263.

Lai, S., Y. Zhu, and B. Deal. 2023. Did COVID-19 Reshape Visitor Preferences in Urban Parks? Investigating Influences on Sentiments in Shanghai, China. *Sustainability*, 15(23): 16396.

Lakićević, M., N. Dedovic, M. Marto, and K. Reynolds. 2024. Urban Parks in Novi Sad (Serbia)—Insights from Landscape Architecture Students. *Urban Science*, 8(3): 99.

Li, J., J. Fu, J. Gao, R. Zhou, K. Wang, and K. Zhou. 2023. Effects of the Spatial Patterns of Urban Parks on Public Satisfaction: Evidence from Shanghai, China. *Landscape Ecology*, 38(5): 1265–1277.

Marathe, R.A., A. Murkute, and D.K. Babu. 2016. Mineral Nutrient Deficiencies and Nutrient Interactions in Pomegranate. *National Academy Science Letters*, 39(6).

Minakawa, Y., S. Miyazaki, H. Waki, Y. Akimoto, and K. Itoh. 2023. Clinical Effectiveness of Trigger Point Acupuncture on Chronic Neck and Shoulder Pain (Katakori) with Work Productivity Loss in Office Workers: A Randomized Clinical Trial. *Journal of Occupational Health*, 66(1).

Mishrif, A., and A. Khan. 2024. Do Free Trade Agreements Facilitate FDI Spillover Effects on Domestic Firms? Empirical Evidence from Oman. *Economies*, 12(6): 141.

Moussaoui, M. 2023. Spatial Transformation—The Importance of a Bottom-Up Approach in Creating Authentic Public Spaces. *Architecture*, 4(1): 14–23.

Nguyen, T., and D. Orange. 2023. Community Approach for Public Flower Garden Renovation in Hanoi Center:

Perspective for Building a Green City. *Water*, 15(15): 2712.

Onose, D., C. Iojă, M. Niţă, G. Vânău, and A. Popa. 2020. Too Old for Recreation? How Friendly Are Urban Parks for Elderly People? *Sustainability,* 12(3): 790.

Pamungkas, A.A., P.I. Pratiwi, and B. Sulistyantara. 2025. Visitor Preferences for Restorative Landscape Elements in Bogor Urban Parks: A Visitor-Employed Photography Approach. *Journal of Natural Resources and Environmental Management*, 15(4): 567–579.

Pandey, B., and A. Ghosh. 2023. Urban Ecosystem Services and Climate Change: A Dynamic Interplay. *Frontiers in Sustainable Cities*, 5.

Paudel, S., and S.L. States. 2023. Urban Green Spaces and Sustainability: Exploring the Ecosystem Services and Disservices of Grassy Lawns Versus Floral Meadows. *Urban Forestry & Urban Greening*, 84: 127932.

Pertami, R.R.D., Jumiatun, and B. Etikasari. 2021. Standardisasi Pekerjaan Pemeliharaan Pertamanan di Kabupaten Jember. *Jurnal Lanskap Indonesia*, 13(2): 61–70.

Qin, L., W. Zong, K. Peng, and R. Zhang. 2024. Assessing Spatial Heterogeneity in Urban Park Vitality for a Sustainable Built Environment: A Case Study of Changsha. *Land,* 13(4): 480.

Rangkuti, F. 2006. Analisis SWOT: Teknik Membebah Kasus Bisnis. Jakarta: PT Gramedia Pustaka Utama.

Schyff, R., D. Botha, and S. Ellis. 2018. Undergraduate Students' Perceptions of Factors Affecting Job Satisfaction. *SA Journal of Human Resource Management*, 16.

Shams, I., and A. Barker. 2019. Barriers and Opportunities of Combining Social and Ecological Functions of Urban Greenspaces – Users' and Landscape Professionals' Perspectives. *Urban Forestry & Urban Greening*, 39: 67–78.

Širok, K., M. Stubelj, M. Voglar, D. Manojlović, D. Radoja, S. Laporšek, M. Vodopivec, A. Arzenšek, N. Rozman, M. Macur, K. Pesjak, and S. Perčič. 2022. Star-Vital, a Four-Year Comprehensive Workplace Health Promotion Program: Study Design. *International Journal of Environmental Research and Public Health*, 19(10): 5854.

Skaržauskienė, A., and M. Mačiulienė. 2019. Assessment of Digital Co-Creation for Public Open Spaces: Methodological Guidelines. *Informatics*, 6(3): 39.

Spagnoli, L., and L. Mundula. 2021. Between Urban and Rural: Is Agricultural Parks a Governance Tool for Developing Tourism in the Periurban Areas? Reflections on Two Italian Cases*. Sustainability*, 13(14): 8108.

Stepus, A., and E. Galyamova. 2021. Forecasting the Working Capacity of Personnel at the Recruitment Stage as a Factor in Ensuring the Sustainable Development of the Enterprise. *E3S Web of Conferences,* 291: 07012.

Suhardono, S., F. Safitri, F. Rachmalia, F. Rizky, D. Khairunnisa, I. Septiariva, and I. Suryawan. 2024. Assessing the Ecological Function Effectiveness of Urban Parks in Surakarta City, Indonesia. *Ecological Engineering & Environmental Technology*, 25(4): 227–240.

Tigere, B., and T. Moyo. 2021. Disability-Inclusive Community Development: A Case of a Community Garden in Limpopo Province in South Africa. *African Journal of Disability*, 10.

Treija, S., G. Stauskis, A. Koroļova, and U. Bratuškins. 2023. Community Engagement in Urban Experiments: Joint Effort for Sustainable Urban Transformation. *Landscape Architecture and Art*, 22(22): 89–97.

Wang, S. 2023. Urban Park Healing Landscape Based on Spatial Correlation Quantitative Model. *Applied Mathematics and Nonlinear Sciences,* 8(2): 1913–1922.

Wang, S., T. Li, D. Li, and H. Cheng. 2021. Contributions of Park Constructions to Residents' Demands of Ecosystem Services Consumption: A Case Study of Urban Public Parks in Beijing. *PLOS ONE*, 16(12): e0259661.

Wardoyo, P. 2011. 6 Alat Analisis Manajemen. Semarang: Semarang University Press.

Wu, S., X. Yao, Y. Qu, and Y. Chen. 2023. Ecological Benefits and Plant Landscape Creation in Urban Parks: A Study of Nanhu Park, Hefei, China. *Sustainability*, 15(24): 16553.

Xu, W., W. Dai, Y. Ding, S. Song, Q. Liu, and W. Yang. 2024. Drivers of Spontaneous Plant Communities in Urban Parks: A Case from Nanjing, China. *Sustainability*, 16(9): 3841.

Yaacob, W. 2024. Quantifying the Cooling Effect for Urban Park Microclimate: An Analysis of Peltophorum pterocarpum Species in KLCC Park, Kuala Lumpur, Malaysia. *Planning Malaysia*, 22.

Yang, M., R. Wu, Z. Bao, H. Yan, X. Nan, Y. Luo, and T. Dai. 2023. Effects of Urban Park Environmental Factors on Landscape Preference Based on Spatiotemporal Distribution Characteristics of Visitors. *Forests,* 14(8): 1559.

Yang, Y., Z. Wang, and G. Lin. 2021. Performance Assessment Indicators for Comparing Recreational Services of Urban Parks. *International Journal of Environmental Research and Public Health*, 18(7): 3337.

Yen, H.-Y., H.-L. Chiu, and H.-Y. Huang. 2021. Green and Blue Physical Activity for Quality of Life: A Systematic Review and Meta-Analysis of Randomized Control Trials. *Landscape and Urban Planning,* 212: 104093.

Yuan, J., Z. Wang, S. Xing, and C. Kim. 2025. Evaluation Study on the Smart and Interactive Landscape Design of Haiyuntai Waterfront Park from the Perspective of a Sustainable City. *Land,* 14(2): 357.

Zeng, Y., and B. Deal. 2023. What Role Do Urban Parks Play in Forming a Sense of Place? Lessons for Geodesign Using Social Media. *Land,* 12(11): 1960.

Zhang, S., H. Song, X. Li, and S. Luo. 2024. Urban Parks Quality Assessment Using Multi-Dimension Indicators in Chengdu, China*. Land*, 13(1): 86.

Zhao, J., Q. Rao, C. Sun, R. Ikram, C. Fan, J. Li, M. Wang, and D. Zhang. 2024. A Systematic Review of the Vertical Green System for Balancing Ecology and Urbanity. *Water*, 16(11): 1472.