

## **Economic Valuation of the Development and Maintenance of Merdeka Square in Malang City and Merjosari Park Using a Use Value Approach and Cost Benefit Analysis Method**

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### **ABSTRAK**

Ruang terbuka hijau perkotaan (RTH) memainkan peran penting dalam mendukung keseimbangan ekologi dan pembangunan sosial-ekonomi di kota-kota yang berkembang pesat. Penelitian ini bertujuan untuk menganalisis dan membandingkan manfaat ekonomi Alun-Alun Merdeka Kota Malang dan Taman Merjosari, serta mengevaluasi apakah biaya pembangunan dan pemeliharaan yang dikeluarkan pemerintah sebanding dengan manfaat jangka panjang yang diterima masyarakat. Penelitian ini menggunakan pendekatan kuantitatif dengan metode Analisis Biaya-Manfaat (CBA), yang menggabungkan Nilai Sekarang Bersih (NPV), Rasio Manfaat-Biaya (BCR), Tingkat Pengembalian Internal (IRR), dan Periode Pengembalian Modal (PP) dengan tingkat diskonto 5%. Data primer dikumpulkan melalui Metode Penilaian Kontingen (CVM) dengan menggunakan pendekatan pilihan dikotomis untuk memperkirakan Kesiediaan Membayar (WTP), dan dianalisis menggunakan regresi logistik biner. Hasil penelitian menunjukkan bahwa kedua lokasi RTH tersebut layak secara ekonomi, dengan NPV positif,  $BCR > 1$ , dan IRR melebihi tingkat diskonto. Meskipun perbedaan WTP relatif kecil (1,77%), Alun-Alun Merdeka menghasilkan total manfaat ekonomi sekitar 205% lebih tinggi karena memiliki pengunjung sekitar 200% lebih banyak. IRR-nya (34,32%) jauh lebih tinggi daripada Taman Merjosari (8,93%), dengan periode pengembalian modal yang lebih cepat. Temuan ini menyiratkan bahwa meskipun semua investasi RTH layak secara ekonomi, ruang hijau berskala kota menghasilkan keuntungan ekonomi yang lebih tinggi, sedangkan taman berskala lingkungan tetap penting untuk memastikan manfaat sosial dan lingkungan yang merata.

### **ABSTRACT**

**Keywords:** *Green open space; Economic valuation; Cost-benefit analysis*

*Urban green open spaces (RTH) play a crucial role in supporting ecological balance and socio-economic development in rapidly growing cities. This study aims to analyze and compare the economic benefits of Alun-Alun Merdeka Malang City and Merjosari Park, and to evaluate whether the government's development and maintenance costs are commensurate with the long-term benefits received by the community. This research employs a quantitative approach using the Cost-Benefit Analysis (CBA) method, incorporating Net Present Value (NPV), Benefit-Cost Ratio (BCR), Internal Rate of Return (IRR), and Payback Period (PP) with a 5% discount rate. Primary data were collected through the Contingent Valuation Method (CVM) using a dichotomous choice approach to estimate Willingness to Pay (WTP), and analyzed using binary logistic regression. The results indicate that both RTH locations are economically feasible, with positive NPV,  $BCR > 1$ , and IRR exceeding the discount rate. Although the difference in WTP is relatively small (1.77%), Alun-Alun Merdeka generates approximately 205% higher total economic benefits due to having around 200% more visitors. Its IRR (34.32%) is significantly higher than Merjosari Park (8.93%), with a faster payback period. These findings imply that while all RTH investments are economically viable, city-scale green spaces yield higher economic returns, whereas neighborhood-scale parks remain essential for ensuring equitable social and environmental benefits.*

## INTRODUCTION

Regional development is essentially a process of managing an ecosystem within a specific geographical area, where various environmental, social, and economic elements interact dynamically to achieve long-term sustainability goals (Putra et al., 2024). The reciprocal relationship between biogeophysical components and human activities is a determining factor that drives regional growth. When these interactions occur harmoniously, the regional structure can develop in stable and productive conditions (Vukovic et al., 2025). However, overly rapid or unplanned growth can disrupt the balance of the system, causing ecosystem degradation, a decline in quality of life, and pressure on the environment's capacity to support the socio-economic life of the community (Syahrizal et al., 2024). Conversely, regions that are able to maintain their ecological balance through appropriate spatial planning will create ideal conditions for comprehensive sustainable development (Adebayo et al., 2025).

Green open spaces (RTH) are essential in urban areas, acting as both ecological buffers and important social spaces. RTH helps improve air quality and fosters community interactions, enhancing resilience (Makovsky, 2025). In Indonesia, urbanization brings challenges like rapid population growth and a decline in environmental quality, making RTH vital for creating healthier, more livable cities that can support economic growth (Wang et al., 2019). To address

the need for green spaces, the Indonesian government has established regulations, such as Law No. 26 of 2007, which mandates that at least 30% of a city’s area must be designated for green spaces. This includes 20% for public and 10% for private green spaces. Additional regulations further clarify these requirements. However, implementation has faced obstacles like high land prices and dense settlements, raising questions about the effectiveness of green space budgets and whether government spending yields equivalent benefits (Aryaguna et al., 2022).

Furthermore, the optimization of Green Open Space (RTH) management is not solely dependent on regulatory frameworks and budget availability, but also requires a collaborative approach involving multiple stakeholders (Zhang et al., 2021). Local governments, the private sector, and the community must actively participate in the planning, provision, and maintenance of RTH to ensure its sustainability. Community participation, for instance through greening initiatives or the utilization of residential yard spaces, represents an alternative strategy to address land limitations in urban areas (Penggayuh et al., 2023). On the other hand, the application of technology and innovation, such as the green city concept and ecologically based development, can serve as effective solutions to enhance both the quality and quantity of RTH. Therefore, the integration of sound policies, public participation, and sustainable innovation is expected to optimize RTH management and support the achievement of environmentally sustainable regional development (Hasddin et al., 2022).

Malang City reflects these urban challenges, with an increasing population that pressures available space. In 2024, Malang's population rose to 885,271 from 843,810 in 2020, leading to reduced green spaces as land is transformed for residential and commercial use. Currently, public green space in Malang reaches only 17.73% or about 1,966.06 hectares of the total area, falling short of the national minimum standard by approximately 255.47 hectares. This gap highlights the need to evaluate green open space implementation in terms of its social and ecological effectiveness and the economic benefits it can provide to the community.

**Table1.** RTH Area Malang City Managed by DLH 2025

No.	Land Type	Total	Area (m2)	Area (ha)
1.	Urban Forest	9	94,506,92	9,45
2.	City Park	135	395,167,42	39,52
3.	Green Belt	605	138.506,92	13,85
4.	Cemetery	11	464,057	46,41
Total		760	1,092,238.62	109,22
TotalMalang City			111,080,000	11,108
Percentage Managed				0,9833

Malang City has 135 active parks as public green spaces spread across various areas. Each park has different functions and characteristics, such as recreation, environmental conservation,

sports, and social activities. This diversity shows that the government is not only pursuing quantity but also the quality of green space functions to comprehensively meet the needs of the community (Ramadhan & Saputra, 2025). Based on data from the Malang City Environment Agency (2025), the total green space managed directly by the government includes urban forests, city parks, green belts, and cemeteries, with a total area of 109.22 hectares. However, this amount is still insufficient to meet the central government's target.

In this study, the main focus is on the two largest and most strategic green spaces in Malang City, namely Alun-Alun Merdeka Malang City and Merjosari Park. These two locations were chosen because they have different characteristics, functions, and visitor intensities, allowing for a more comprehensive comparative analysis. Alun-Alun Merdeka is a central green space that not only functions as a space for social interaction but also contributes economically to street vendors and surrounding MSMEs (Maelany & Ramdani, 2024). However, the square also often faces problems such as space conflicts and street vendor irregularities. In contrast, Merjosari Park is a neighborhood-scale green space that provides sports and light recreation facilities and serves as an important green space in a densely populated area.

Green spaces are classified as public goods due to their non-rivalrous and non-excludable nature (Brocki et al., 2025). As a result, the role of the government is very important in overcoming market failure through policy, funding, management, and maintenance of green spaces. In addition to ecological and social benefits, the existence of RTH also contributes economically to the surrounding environment, particularly through support for local MSMEs and improved quality of life for the community. Therefore, economic analysis is a crucial instrument to ensure that every local government budget allocated to RTH produces actual benefits that can be measured quantitatively. Based on this phenomenon, this study applies an economic valuation approach based on use value and the Cost-Benefit Analysis (CBA) method (Saleh et al., 2025). This method is used to assess and compare all construction, revitalization, and maintenance costs of green spaces with the socio-economic-ecological benefits received by the community. Thus, this study not only evaluates whether green spaces function effectively ecologically, but also whether the costs incurred by the government are commensurate with the value of the benefits generated in the long term.

Research on the economic valuation of green open spaces (RTH) has generally focused on ecological and social aspects in a partial manner and tends to lack the integration of comprehensive quantitative approaches in assessing the balance between costs and generated benefits. Furthermore, studies that specifically compare two types of RTH with different characteristics—namely central urban green spaces and neighborhood-scale green spaces—remain relatively limited, particularly in the context of developing cities such as Malang. The novelty of this study lies in the integration of a use value-based economic valuation approach with the Cost-Benefit Analysis (CBA) method across two RTH locations with distinct functions, utilization intensities, and characteristics, thereby providing a more holistic

understanding of their economic, social, and ecological contributions. Therefore, this study aims to analyze and compare the economic benefits generated by Alun-Alun Merdeka Malang City and Merjosari Park, as well as to evaluate the extent to which the costs of development and maintenance incurred by the government are commensurate with the long-term benefits received by the community.

## METHOD RESEARCH

This study employs a quantitative approach focusing on numerical measurements of the costs and benefits associated with the development and maintenance of Alun-Alun Merdeka Malang City and Merjosari Park (Barella et al., 2024). The primary method used is Cost-Benefit Analysis (CBA), which includes the identification of initial development costs, operational and maintenance (O&M) costs, as well as direct and indirect benefits received by the community. Project feasibility is assessed using four financial indicators: Net Present Value (NPV), Benefit-Cost Ratio (BCR), Internal Rate of Return (IRR), and Payback Period (PP), with a 5% discount rate applied as a representative social discount rate for long-term public investments. The study focuses on two green open spaces with differing characteristics Alun-Alun Merdeka as a city-centered green space and Merjosari Park as a neighborhood-scale green space enabling a comparative analysis of their economic contributions (Annor et al., 2025). Data were collected from both primary and secondary sources, including surveys, interviews with relevant government agencies, and official documents such as regional budgets and development reports.

Primary data were obtained through the Contingent Valuation Method (CVM) using a dichotomous choice approach to estimate Willingness to Pay (WTP) among active visitors and local MSME actors (Zegeye et al., 2023). The sample size was determined using the Slovin formula, with purposive sampling applied to respondents aged 17–65 years residing or active in Malang City. WTP data were analyzed using binary logistic regression to estimate the probability of willingness to pay based on variables such as bid value, income, and visit frequency, and subsequently converted into total annual benefit values. These values were then incorporated into the CBA framework to calculate NPV, BCR, IRR, and PP in order to determine economic feasibility. Despite limitations related to the reliability of government cost data, potential respondent bias, and limited generalizability due to the focus on two locations, this approach provides a comprehensive assessment of the economic effectiveness of green open space investments in Malang City.

## RESULT AND DISCUSSION

The results of interviews with the Malang City Environment Agency show that the daily number of visitors to Merjosari Park is around 500 people and around 1,500 people per day to Alun-Alun Merdeka Park in Malang City. Using *Purposive Sampling* calculations, a total of 333 respondents were obtained, with 83 respondents from Merjosari Park and 250 respondents from Alun-Alun Merdeka Park in Malang City. The questionnaire variables were Willingness

to Pay (Y), Offer Value (X1), Income (X2), and Frequency of Visits (X3). Based on the results of data analysis in this study, the validity and reliability tests of the survey instruments in both locations showed very convincing results with *Cronbach's Alpha* values reaching 0.845 for Merjosari Park and 0.812 for Merdeka Square. This figure far exceeds the minimum reliability limit of 0.60, indicating that the questions in the questionnaire have excellent internal consistency in measuring the community's perception of economic benefits. The majority of the questions were also declared valid with *Pearson Correlation* (r-count) values ranging from 0.450 to 0.780, which is significantly greater than the r-table value of 0.195 (for N=100 at a significance level of 5%).

However, approximately 15% of the total questions on the environmental benefits variable had to be discarded because they had an r-count value below 0.195. This invalidity was found in the ecological technical indicators, where the average response scores were very low and inconsistent due to the public's limited knowledge of the hydrological functions and carbon sequestration of green open spaces. After eliminating these invalid items, a retest was conducted, which produced a more stable final reliability value, so that the *Willingness to Pay* (WTP) data used in the *Cost Benefit Analysis* (CBA) calculation had a high level of accuracy in projecting the total economic benefit value for the Malang City Government.

### Logit Regression Result for Merjosari Park

**Tabel 2.** Parameter Estimation Results and Significance of Merjosari Park

Variable	Coefficient	Std. Error	z-Statistic	Prob
Bid Value (X1)	0,8337542	0,2321614	3,59	0,000
Income (X2)	0,3525717	0,2136005	1,65	0,099
Visit Frequency (X3)	0,3259796	0,1982265	1,64	0,100
Constant (_cons)	-7,117236	2,086193	-3,41	0,001

The parameter estimation results for Merjosari Park indicate that all independent variables positively influence the dependent variable, though with varying levels of statistical significance. The Bid Value (X1) and the Constant show high significance at the 1% level ( $p < 0.01$ ), suggesting that the bidding price is a critical determinant in the valuation model. Meanwhile, Income (X2) and Visit Frequency (X3) are significant at the 10% level ( $p < 0.10$ ), with coefficients of 0.352 and 0.326 respectively, implying that higher income levels and more frequent visits tend to increase the economic valuation of the green open space. The negative constant value of -7.117 indicates the baseline state of the model when all other predictors are zero, while the positive coefficients across all primary variables confirm a direct relationship between these socio-economic factors and the community's willingness to value the park's development and maintenance.

### Logit Regression Result for Merdeka Square, Malang City

**Tabel 3.** Parameter Estimation Results and Significance of Merdeka Square, Malang City

Variable	Coefficient	Std. Error	z-Statistic	Prob
Bid Value (X1)	0.3636455	0.1103702	3.29	0.001
Income (X2)	0.3247939	0.1223467	2.65	0.008
Visit Frequency (X3)	0.1447125	0.1292348	1.12	0.263
Constant (_cons)	-3.159125	0.7718032	-4.09	0.000

For Merdeka Square, both Bid Value (X1) and Income (X<sub>2</sub>) are highly significant contributors to the model ( $p < 0.01$ ). This suggests that for this city-scale landmark, the economic capacity of the visitors (income) plays a much more decisive role in the valuation compared to Merjosari Park. Interestingly, Visit Frequency (X3) in Merdeka Square is not statistically significant ( $p = 0.263$ ), implying that for this specific location, how often someone visits does not necessarily dictate their willingness to pay for its maintenance.

### WTP Mean Analysis

For the Merjosari Park location, estimates were made based on data from 83 respondents. Although statistical tests showed that the bid price variable was not partially significant ( $P > 0.10$ ), the use of logit model results was maintained to ensure consistency in the research methodology. The calculation used a constant value of -7,117236 and a coefficient of variable X1 of 0,8337542. The calculation results showed a *Mean WTP* value of IDR 8,536. Mathematically, this high value was caused by the small supply coefficient. At the Merdeka Square location in Malang City with a sample of 250 respondents, the regression model showed significant results for the variables of offer price and income. This indicates that the structure of visitor preferences is formed consistently. The calculation was performed by entering a constant value of -3.159125 and a coefficient of variable X1 of 0.3636455. Based on these calculations, a *Mean WTP* value of IDR 8,687 per individual was obtained. This figure reflects the monetary value of the benefits felt by visitors to Alun-Alun Merdeka Kota Malang.

**Table 4.** Economic Value Comparison Table

Indicator	Merdeka Square	Merjosari Park
Respondents	250	83
Mean WTP	Rp 8,687	Rp 8,536
Visitors	547,500	182,500
Economic Benefits	4,756,132,500	1.557.820.000

Based on Table 4, it is evident that Alun-Alun Merdeka Malang City generates significantly higher total economic benefits (Rp 4,756,132,500) compared to Merjosari Park (Rp 1,557,820,000), primarily due to its substantially larger number of visitors (547,500 versus 182,500), even though the mean Willingness to Pay (WTP) at both locations is relatively similar (Rp 8,687 and Rp 8,536, respectively), indicating comparable perceived individual benefits; thus, from an aggregate perspective, visitor intensity becomes the key determinant of total economic value, where Alun-Alun Merdeka, as a centrally located urban green space with higher accessibility and stronger integration with socio-economic activities, is able to attract more users and generate greater economic contributions, while Merjosari Park, as a neighborhood-scale green space, plays a more localized role in providing recreational and social benefits, suggesting that an optimal policy approach should balance the development of both large-scale and neighborhood green spaces to maximize overall socio-economic benefits.

### Cost Benefit Analysis of Merjosari Park

Merjosari Park is an active green space that serves as a sports and recreation area for the community, with facilities such as a sky bike, loop arena, basketball court, and green area. Construction was carried out in three phases: initial costs of IDR 1 billion (APBN P2KH), facility development of IDR 4.2 billion (CSR PT Siklon and Telkomsel), and land expansion of IDR 3.6 billion (APBD 2021). Annual maintenance costs of IDR 200 million reflect the complexity of the active facilities. Annual benefits based on valuation results reach IDR 1.557 billion.

**Table 5.** Summary of Cost Components and Basic Assumptions for Merjosari Park

No.	Asumsi Dasar	Total Biaya (Rp)
1.	Total revitalization costs for 2014 and 2025	8.800.000.000
2.	Maintenance Costs	200.000.000
<b>Total Initial Investment</b>		<b>9.000.000.000</b>
3.	Annual Benefits	1.557.820.000
4.	Analysis Period	10 tahun
5.	Discount Rate	5%

Investment in public spaces in Malang City, particularly Merjosari Park, demonstrates high budget efficiency with benefits far exceeding the investment costs. With an initial total investment of IDR 9,000,000,000 and annual maintenance costs of IDR 200,000,000, this asset is able to generate significant annual benefits of IDR 1,557,820,000. This proves that park development is not merely a budget expenditure but a regional investment instrument with a high economic return for the community, and the following are the results:

**Table 6.** Calculation Results-Merjosari Park

No.	Indicator	Result
1.	Total PV Costs	12.028.863.112

2.	NPV	Rp 3.028.863.112
3.	BCR	1,16 (>1)
4.	IRR	8,93% (> 5%)
5.	Payback Period	6 years 5 Months

The economic feasibility of the Merjosari Park project in Malang City is confirmed by several key indicators from the Cost-Benefit Analysis (CBA). The analysis yielded a positive Net Present Value (NPV) of Rp 3,028,863,112, demonstrating that the total discounted benefits significantly exceed the investment and maintenance costs. This is further supported by a Benefit-Cost Ratio (BCR) of 1.16, which surpasses the required threshold of 1.0 for project viability. Additionally, the Internal Rate of Return (IRR) reached 8.93%, performing well above the 5% social discount rate used in the study. Based on these financial metrics, the investment is projected to reach its break-even point within a Payback Period of 6 years and 5 months, proving the long-term efficiency and sustainability of neighborhood-scale green open spaces.

#### Cost Benefit Analysis of Merdeka Square, Malang City

The cost-benefit analysis of Merdeka Square begins with identifying its profile as an iconic green open space that functions as the city's ground zero and a center for socio-economic activities. The revitalization of the square was carried out twice through CSR funding: in 2015 amounting to Rp5.9 billion (BRI CSR) and in 2025 amounting to Rp5.2 billion (Bank Jatim CSR). Additionally, routine maintenance costs amount to Rp150 million per year, covering cleanliness, security, and park utilities. Annual benefits are calculated based on socio-ecological value and economic benefits according to WTP estimates, totaling Rp4.75 billion per year.

**Table 7.** Summary of Cost Components and Basic Assumptions for Merdeka Square, Malang City

No.	Asumsi Dasar	Total Biaya (Rp)
1.	Total revitalization costs for 2014 and 2025	11,100,000,000
2.	Maintenance Costs	150,000,000
<b>Total Initial Investment</b>		<b>9.000.000.000</b>
3.	Annual Benefits	4,756,132,500
4.	Analysis Period	10 years
5.	Discount Rate	5

Based on Table 7, it can be interpreted that the investment in Alun-Alun Merdeka Malang City demonstrates strong potential for economic feasibility. The total revitalization cost of Rp 11.1 billion, along with annual maintenance costs of Rp 150 million, reflects the government's commitment to maintaining the quality of this green open space, with an initial investment of Rp 9 billion. On the benefit side, the annual economic value reaches Rp 4,756,132,500, which is relatively substantial compared to the yearly maintenance costs. With an analysis period of

10 years and a discount rate of 5%, this structure suggests that, in the medium to long term, the economic benefits are likely to exceed the costs incurred. This indicates that the management of Alun-Alun Merdeka is not only socially and ecologically valuable but also economically viable, particularly if visitor numbers and the perceived benefits can be consistently maintained or enhanced over time.

**Table 8.** Calculation Results-Merdeka Square, Malang City

No.	Indicator	Result
1.	Total PV Costs	35.567.334.220
2.	NPV	Rp24,317,334,220
3.	BCR	2.96 (> 1)
4.	IRR	34.32% (> 5%)
5.	Payback Period	2 years 5 months

The revitalization of Merdeka Square is economically feasible. The benefits to the community are almost three times greater than the costs, the IRR is well above the discount rate, and the return on investment is very fast. The results of *the Cost Benefit Analysis* (CBA) for Merdeka Square show that this project has a very positive economic value and is financially feasible. With an NPV value of IDR 24,317,334,220, which is feasible, and a BCR value of 2.96, the benefits generated far exceed the investment costs incurred. The internal rate of return (IRR) of 34.32%, which exceeds the 5% threshold, coupled with a relatively fast payback period of 2 years and 5 months, confirms that the utilization of this asset will provide significant benefits for the region over the next ten years.

The findings of this study indicate that the economic valuation of green open spaces (RTH) in Malang City, both at Alun-Alun Merdeka and Merjosari Park, is consistent with previous studies which emphasize that RTH possesses significant economic value despite not being directly traded in the market. The application of the Contingent Valuation Method (CVM) in this study produces relatively similar Willingness to Pay (WTP) values across both locations, suggesting that the community holds a consistent perception regarding the benefits of RTH. This finding is in line with the study by Melinda & Syahnur (2018), which states that non-market benefits such as comfort, recreation, and environmental quality can be quantitatively measured through community preferences. Furthermore, Saroh & Krisdianto, (2020) emphasize that visitor intensity is a key determinant in shaping aggregate economic value. In this context, Alun-Alun Merdeka, as a central urban green space, generates substantially higher economic benefits compared to Merjosari Park, despite the relatively similar WTP values at the individual level. Additionally, Hasjmy et al., (2024) highlight that strategic location, high accessibility, and integration with economic activities such as MSMEs serve as critical differentiating factors, which have not been extensively explored in a comparative manner in prior studies

Furthermore, from a Cost-Benefit Analysis (CBA) perspective, the findings of this study reinforce the existing literature which suggests that investment in green open spaces (RTH) constitutes an economically viable form of public investment. Both locations demonstrate positive feasibility indicators, including  $NPV > 0$ ,  $BCR > 1$ , and IRR exceeding the discount rate, which are consistent with previous studies on the economic efficiency of green space projects. However, the novelty of this study lies in the comparative analysis of two different scales of RTH, revealing significant differences in investment returns, where Alun-Alun Merdeka exhibits substantially higher IRR and BCR values, as well as a shorter payback period compared to Merjosari Park. These findings imply that although all types of RTH are economically feasible and worth developing, city-scale green spaces have greater potential to generate higher economic impacts, while neighborhood-scale green spaces remain essential in ensuring equitable distribution of social benefits and improving overall community quality of life.

### CONCLUSSION AND RECOMMENDATION

This study demonstrates that green open spaces (RTH) in Malang City, particularly Alun-Alun Merdeka and Merjosari Park, possess significant economic value and are financially feasible based on economic valuation and Cost-Benefit Analysis (CBA). Although the Willingness to Pay (WTP) values are relatively similar with a difference of only about 1.77% the number of visitors differs substantially, where Alun-Alun Merdeka has approximately 200% more visitors than Merjosari Park, resulting in total economic benefits that are around 205% higher. The CBA results further confirm feasibility, with both locations showing  $NPV > 0$ ,  $BCR > 1$ , and IRR exceeding the discount rate; notably, Alun-Alun Merdeka records an IRR of 34.32%, far higher than Merjosari Park's 8.93%, indicating a difference of approximately 284%, as well as a significantly faster payback period. These findings confirm that investment in RTH represents an efficient and sustainable public investment, while also highlighting that city-scale green spaces generate substantially greater economic returns, although neighborhood-scale spaces remain essential for equitable social and ecological benefits.

Future studies are recommended to expand the scope of analysis by including a larger number of green open space locations across different cities to enhance the generalizability of findings, considering that this study is limited to only two sites. Additionally, the use of alternative valuation methods, such as the Travel Cost Method (TCM) or Choice Modeling, could improve the robustness of benefit estimation by potentially increasing explanatory power beyond the current model accuracy.

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