“Service quality, facility quality, and visitor loyalty: Mediating role of satisfaction in urban green tourism in Surabaya, Indonesia”

AUTHORS	Muhammad Hayyu Hani Nuril Suyanto Liosten Rianna Roosida Ully Tampubolon

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Muhammad Hayyu Hani Nuril (Indonesia), **Suyanto** (Indonesia),
Liosten Rianna Roosida Ully Tampubolon (Indonesia)

SERVICE QUALITY, FACILITY QUALITY, AND VISITOR LOYALTY: MEDIATING ROLE OF SATISFACTION IN URBAN GREEN TOURISM IN SURABAYA, INDONESIA

Abstract

This study aims to examine how service and facility quality influence visitor loyalty through the mediating role of satisfaction in urban green tourism destinations in Surabaya, Indonesia. A convergent parallel mixed-methods design was employed, combining partial least squares structural equation modeling (PLS-SEM) of survey data from 400 respondents with reflexive thematic analysis of 24 semi-structured interviews, collected across three urban parks in Surabaya between March and April 2026. Quantitative results demonstrate that service quality ($\beta = 0.576$, $t = 7.646$, $p < 0.001$) and facility quality ($\beta = 0.364$, $t = 4.849$, $p < 0.001$) significantly predict satisfaction, jointly explaining 82.4% of its variance ($R^2 = 0.824$), while satisfaction exerts the strongest effect on visitor loyalty ($\beta = 0.703$, $t = 8.896$, $p < 0.001$), accounting for 78.0% of its variance ($R^2 = 0.780$). Satisfaction fully mediates the facility quality–loyalty relationship (indirect $\beta = 0.256$, $p < 0.001$; direct effect non-significant) and partially mediates the service quality–loyalty relationship (indirect $\beta = 0.405$, $p < 0.001$; direct $\beta = 0.166$, $p = 0.042$). These findings converge with three qualitative themes: ecological authenticity as a trust-building mechanism, facility cues as affective satisfaction drivers, and social embeddedness of loyalty intentions. Satisfaction operates as the central, type-contingent mechanism converting both service and facility quality into visitor loyalty, offering destination managers and municipal policymakers evidence for co-optimizing service delivery and ecological facility standards.

Keywords loyalty, satisfaction, mediation, service quality, urban green tourism

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Muhammad Hayyu Hani Nuril, Undergraduate Student, Research Assistant, School of Management, Faculty of Economics and Business, University Dr. Soetomo Surabaya, Indonesia. (Corresponding author)

Suyanto, Dr. Ir., M.M., M.E., Vice Rector for Academic Affairs and Students, Faculty of Economics and Business, University Dr. Soetomo Surabaya, Indonesia.

Liosten Rianna Roosida Ully Tampubolon, Prof., Dr., Dra., M.M., Faculty of Economics and Business, University Dr. Soetomo Surabaya, Indonesia.

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INTRODUCTION

Global urban green space coverage has expanded markedly over the past decade, with municipal green recreational areas now estimated to constitute 15–40% of total land use across major Asian megacities, accommodating hundreds of millions of recreational visits annually. Concurrently, the World Tourism Organization (UNWTO, 2023) projects nature-integrated urban tourism to become one of the fastest-growing tourism segments through 2030, propelled by post-pandemic shifts in visitor preference toward health-promoting, ecologically embedded leisure environments (Zenker & Kock, 2020). This trajectory underscores the growing economic and social significance of urban green destinations within contemporary tourism systems.

Despite this momentum, the behavioral mechanisms underlying visitor loyalty in urban green tourism remain inadequately understood. In particular, how service quality and facility quality jointly converge

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to generate loyalty through the pathway of satisfaction constitutes a scientific problem that has not been rigorously resolved. Satisfaction is widely regarded as the pivotal construct linking quality perceptions to loyalty outcomes (Han et al., 2021; Hussain et al., 2023), and service quality is consistently identified as a primary determinant of satisfaction across hospitality and tourism settings (Phan Thi Hang & Nguyen, 2024; Manyangara et al., 2025; Thakur & Kumar, 2026; Alsiehemy, 2023). Facility quality – encompassing physical infrastructure, ecological upkeep, and amenity standards – has likewise drawn increasing scholarly attention as an independent antecedent of satisfaction and behavioral intention (Qiu et al., 2024; Poniman et al., 2025). However, the absence of a unified structural framework that simultaneously accounts for both antecedents within the specific setting of urban green tourism represents an unresolved theoretical problem.

This scientific issue carries particular weight in the Indonesian context. Indonesia's tourism sector contributed approximately 5.5% of GDP prior to the pandemic and has since pursued an aggressive recovery, with domestic urban tourism recording a 34% visitation rebound between 2022 and 2023 (Kementerian Pariwisata dan Ekonomi Kreatif Republik Indonesia, 2023). Surabaya, Indonesia's second-largest city with a population exceeding three million, has invested substantially in urban green infrastructure, including the 33-hectare Kebun Bibit Wonorejo and the longitudinal Kenjeran coastal park system. However, empirical evidence on visitor loyalty dynamics within these destinations remains largely absent, leaving destination managers without a reliable evidentiary basis for decision-making (Alfarizi et al., 2025; Sasongko et al., 2025; Hayati & Widodo, 2024).

1. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Research on destination loyalty has long been anchored in the premise that perceived quality drives satisfaction, which in turn generates loyalty. The conceptual foundation of this study rests on three complementary theoretical traditions. The Quality–Satisfaction–Loyalty (Q-S-L) paradigm, rooted in expectancy-disconfirmation theory (Oliver, 1980), posits that perceived quality shapes satisfaction through expectation–performance comparison, which subsequently generates loyalty – a sequence extensively validated across hospitality and tourism settings (Han et al., 2021; Hussain et al., 2023; Chemeda et al., 2025). Within this paradigm, service quality has typically been operationalized through the SERVQUAL framework (Parasuraman et al., 1988) and its performance-only refinement, SERVPERF (Cronin & Taylor, 1992), which disaggregate service quality into reliability, responsiveness, assurance, empathy, and tangibility – dimensions later validated in park-based contexts (Pakurár et al., 2019). Complementing this service-centric view, servicescape theory and environmental psychology (Bitner, 1992; R. Kaplan & S. Kaplan, 1989; Gehl, 2011) conceptualize the physical environment as an independent determinant of visitor affect and engagement, positioning facility quality as a theoretically distinct, though comparatively underexplored, satisfaction antecedent. Although each tradition offers partial explanatory power, no prior study within Indonesian urban green tourism has integrated all three into a single structural framework.

This theoretical gap is compounded by the distinctive character of urban green tourism itself. Situated at the convergence of urban tourism, ecotourism, and sustainability-oriented leisure, urban green tourism mobilizes city parks, riverfront corridors, and ecological reserves as accessible, nature-integrated recreational spaces that serve both leisure and public-health functions (Li & Du, 2025; Zenker & Kock, 2020; Fang & Ko, 2025; Jimenez-García et al., 2025). The domain has attracted growing scholarly attention across China (Shao & Chung, 2024; Qiu et al., 2024), Africa (Chemeda et al., 2025), Southeast Asia (Luo & Li, 2024; Nasution et al., 2025), Europe (Felappi et al., 2024), and Latin America (Luján Vera et al., 2025), with municipal green space increasingly recognized as a fast-growing tourism segment globally (UNWTO, 2023). However, the majority of this scholarship adopts single-construct frameworks or geographically narrow samples.

Moreover, none simultaneously models service quality and facility quality effects on visitor loyalty within an Indonesian megacity. This contextual lacuna is rendered consequential by Indonesia's post-pandemic tourism recovery momentum (Kementerian Pariwisata dan Ekonomi Kreatif Republik Indonesia, 2023) and by Surabaya's substantial investment in green infrastructure, including the 33-hectare Kebun Bibit Wonorejo and the Kenjeran coastal park system (Alfarizi et al., 2025; Sasongko et al., 2025).

Within the Q-S-L framework, service quality and facility quality function as theoretically distinct yet empirically interrelated antecedents of satisfaction. Their dimensions – particularly responsiveness, professionalism, and empathy – consistently emerge as robust satisfaction predictors across park and destination contexts (Parasuraman et al., 1988; Cronin & Taylor, 1992; Luo & Li, 2024; Nasution et al., 2025; Phan Thi Hang & Nguyen, 2024; Manyangara et al., 2025; Wireko-Gyebi et al., 2024). Ecologically themed parks report amplified service quality effects relative to conventional urban settings (Garín-Muñoz & Moral, 2017; Akroush et al., 2016), suggesting context-specific moderation warranting examination within green tourism. Facility quality – encompassing physical amenities, accessibility, ecological upkeep, safety infrastructure, and aesthetic design – constitutes an independent satisfaction driver grounded in servicescape theory (Bitner, 1992) and environmental psychology (R. Kaplan & S. Kaplan, 1989). This relationship is consistently affirmed by Southeast Asian evidence (Suminar et al., 2024; Samsudin & Suhalya, 2025; Shao & Chung, 2024; Felappi et al., 2024). Nonetheless, facility quality remains comparatively under-theorized regarding its ecological and sustainability dimensions in green park contexts (Qiu et al., 2024; Chemeda et al., 2025), an asymmetry this study addresses by incorporating sustainability-aligned design, green pathway comfort, and inclusive accessibility as integral facility quality components.

The satisfaction–loyalty relationship represents the most extensively validated link in destination management literature. Oliver (1999) distinguishes behavioral loyalty (revisit intention, word-of-mouth) from attitudinal loyalty (destination attachment, preference stability). Empirical evidence consistently confirms that satisfaction drives both dimensions across park and nature-based tourism settings (Garín-Muñoz & Moral, 2017; Praharjo, 2020; Carvache-Franco et al., 2020; Du & Zhao, 2022; Zhang et al., 2025; Suhartanto et al., 2016; Hapsari et al., 2024). This relationship is, however, non-linear: satisfaction thresholds and contextual moderators – including destination uniqueness and competitive alternatives – can attenuate loyalty formation when quality perceptions fall below critical benchmarks (Hussain et al., 2023; Han et al., 2021; Tjokrosaputro et al., 2024). This dynamic plausibly is amplified in urban green tourism, where ecological authenticity may strengthen satisfaction-loyalty elasticity. The mediating role of satisfaction in converting quality perceptions into loyalty is theoretically grounded in expectancy–disconfirmation theory (Oliver, 1999) and the cognitive-affective attitude framework (Ajzen, 1991), with empirical confirmation across multiple park-based contexts (Zeithaml et al., 1996; Shao & Chung, 2024; Kaulu et al., 2025). However, the relative mediating contribution of each quality antecedent remains contested: service quality yields stronger mediation in developed-context studies (Garín-Muñoz & Moral, 2017), whereas facility quality produces comparably large indirect effects in developing-country settings where infrastructural deficiencies have historically constrained visitor experience (Chemeda et al., 2025; Nasution et al., 2025). This inconsistency is compounded by evidence that satisfaction's mediating strength is contingent on the experiential completeness of the visit (Alamasi et al., 2024), underscoring the need for context-calibrated testing within Indonesian urban green tourism.

Beyond these substantive considerations, the prevailing methodological orientation of destination loyalty research further constrains explanatory depth. Mono-method quantitative paradigms continue to dominate the field, with mixed-methods investigations remaining comparatively infrequent (Respati et al., 2025; Abdilla et al., 2025; Shneikat et al., 2025), limiting the field's capacity to capture constructs – such as ecological authenticity and socially embedded loyalty motivations – that resist full operationalization through Likert-scale instruments alone (Jafar & Ahmad, 2023; Tjokrosaputro et al., 2024; Fang & Ko, 2025). Taken together, service quality and facility qual-

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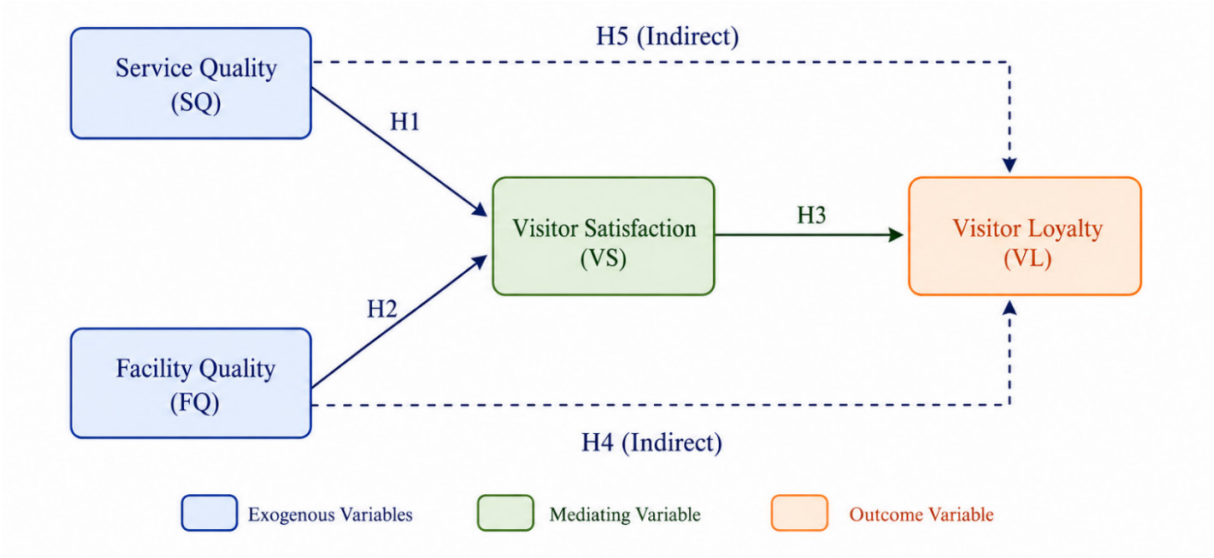

Figure 1. Conceptual model with hypothesized paths

ity are well-validated, independent antecedents of satisfaction, and satisfaction is the primary conduit through which quality perceptions translate into loyalty. Yet no prior study has simultaneously modeled both antecedents within a unified structural framework specific to urban green tourism, nor triangulated such a model with qualitative evidence capable of illuminating the experiential mechanisms – ecological, affective, and social – underlying these statistical relationships, particularly within an Indonesian megacity context (Qiu et al., 2024; Poniman et al., 2025; Munir et al., 2025).

Accordingly, this study aims to examine how service quality and facility quality influence visitor loyalty through the mediating role of satisfaction in urban green tourism destinations in Surabaya, Indonesia, by constructing an integrative service quality–facility quality–satisfaction–loyalty model and validating it through a convergent parallel mixed-methods design that triangulates PLS-SEM with qualitative thematic analysis. The hypothesized relationships among these constructs are illustrated in the conceptual model (Figure 1).

H1: *Service quality has a significant positive effect on visitor satisfaction.*

H2: *Facility quality has a significant positive effect on visitor satisfaction.*

H3: *Visitor satisfaction has a significant positive effect on visitor loyalty.*

H4: *Visitor satisfaction mediates the relationship between facility quality and visitor loyalty.*

H5: *Visitor satisfaction mediates the relationship between service quality and visitor loyalty.*

2. METHOD

2.1. Research design and study context

This study followed a six-step convergent parallel mixed-methods procedure (Creswell & Plano Clark, 2018). Step 1 is design selection. Quantitative partial least squares structural equation modeling (PLS-SEM) was paired with concurrent qualitative reflexive thematic analysis, later merged through triangulation and joint display, because PLS-SEM accommodates the non-normal distributions typical of perception-based tourism data (Hair et al., 2017, 2019). Thematic analysis captures phenomenological dimensions of ecological authenticity and social embeddedness that resist full Likert-scale operationalization (Jafar & Ahmad, 2023; Fang & Ko, 2025). Convergent triangulation strengthens construct validity and the interpretive completeness of mediation findings (Tjokrosaputro et al., 2024; Munir et al., 2025), with integration following a joint display protocol that juxtaposes quantitative path coefficients against qualitative themes to assess convergence, divergence, and complementarity (Abdilla et al., 2025; Respati et al., 2025).

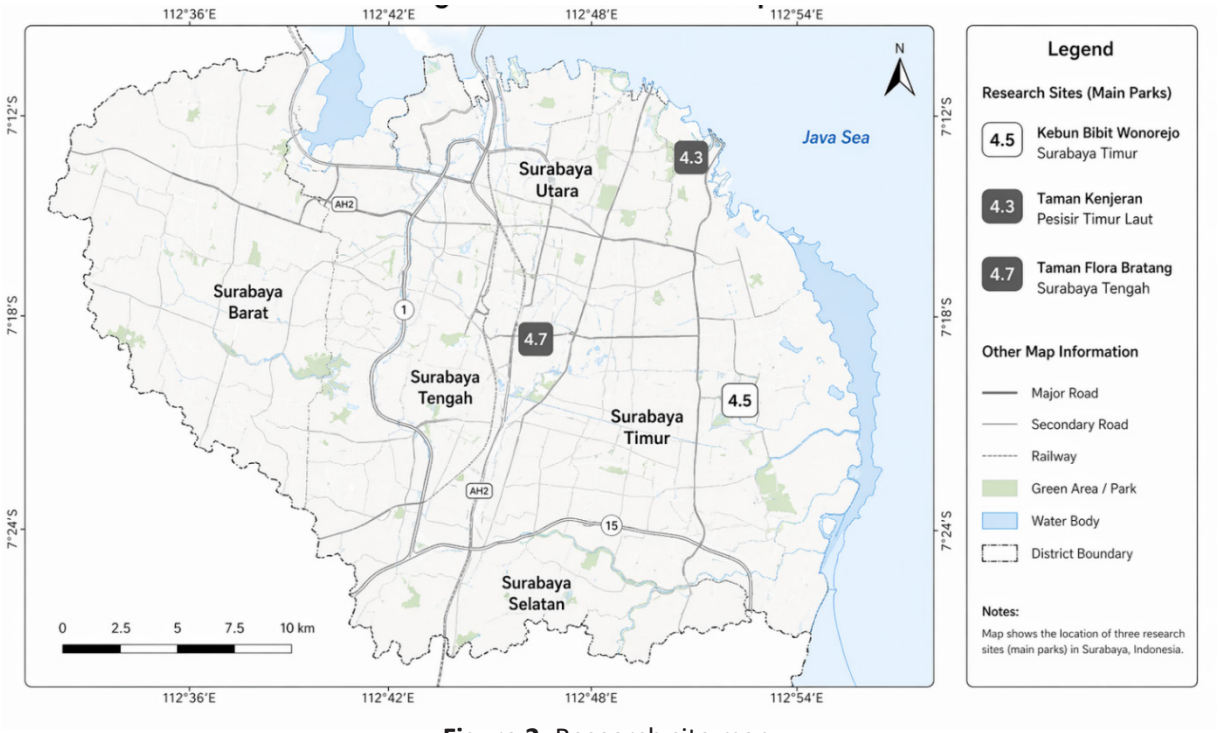

Figure 2. Research site map

Step 2 is site selection. Three urban green tourism destinations in Surabaya (population > 3.1 million) were purposively selected to represent heterogeneous park typologies (Figure 2):

(i) Kebun Bibit Wonorejo, a 33-hectare biodiversity conservation park under the city's Ruang Terbuka Hijau (RTH) framework;

(ii) Taman Kenjeran, a 7.2-km coastal recreational corridor; and

(iii) Taman Flora Bratang, a 2.3-hectare horticultural park with high daily visitation.

A supplementary "Other Parks" category (e.g., Taman Bungkul, Taman Prestasi, Taman Mundu) broadened ecological and sociodemographic coverage, consistent with purposive heterogeneous sampling rationale in mixed-methods tourism research (Fang & Ko, 2025; Jimenez-García et al., 2025).

2.2. Sampling strategy and data collection

Step 3 is quantitative sampling and fieldwork. Stratified random sampling (strata: gender, age cohort, visitation frequency) was applied on-site to ensure proportional representation and mitigate response homogeneity bias (Hair et al., 2017; Hussain et al., 2023). Data were collected across six consecutive weeks (March–April 2026), alternating weekday (Tuesday–Thursday) and weekend (Saturday–Sunday) sessions to capture temporal variation in visitor profiles, with trained enumerators approaching visitors upon park exit to minimize recall bias (Han et al., 2021). The target of 400 respondents was derived from three convergent sample-size guidelines: the 10-times rule (13 maximum arrows × 10 = 130 minimum; Hair et al., 2017), Cohen's (1992) power analysis ($f^2 = 0.15$, $\alpha = 0.05$, power = 0.80; $n \geq 119$), and Soper's (2023) a-priori SEM calculator (31 indicators, 4 latent variables; $n \geq 284$).

This study was conducted in accordance with institutional ethical standards for social science research involving human participants. Ethical approval was obtained from the Faculty of Economics and Business, University Dr. Soetomo, Surabaya, Indonesia, prior to data collection. The study employed a non-interventional cross-sectional survey design involving adult respondents and anonymous questionnaire responses only. No clinical procedures, biomedical interventions, or sensitive personal data collection were involved.

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Informed consent was obtained from all participants prior to their participation in the study. Participation was voluntary; respondents could withdraw at any time without consequence, and all responses were collected anonymously and analyzed in aggregate form solely for academic research purposes.

Step 4 is data screening. A two-stage protocol removed incomplete responses (missing > 10% of items) and low-variance responses (item-level SD < 0.25, indicating straight-lining; Hussain et al., 2023; Poniman et al., 2025), yielding 400 valid responses from 438 distributed questionnaires (utilization rate: 91.3%; 38 cases excluded).

Step 5 is qualitative sampling and fieldwork. Concurrently, 24 semi-structured in-depth interviews were conducted with purposively selected visitors across the three primary parks (8 per site) using maximum variation sampling across visitation frequency, age, and visit motivation. Each interview (30–55 minutes, conducted in Bahasa Indonesia) was digitally recorded with consent and transcribed verbatim, covering five thematic domains: overall park experience, service quality perceptions, facility quality appraisals, satisfaction formation, and loyalty intentions/deterrents. Theoretical saturation was assessed iteratively from interview 18, with full saturation confirmed by interview 22 (Jafar & Ahmad, 2023; Fang & Ko, 2025).

2.3. Respondent profile

Step 6 is profiling the achieved sample. The 400 valid respondents showed balanced gender representation (Male: 49.8%; Female: 50.2%), broadly consistent with general demographic patterns observed among visitors to Surabaya's urban parks. The modal age cohort was 18–25 years (31.5%), reflecting the predominance of young adult visitors in Indonesian megacity green spaces (Alfarizi et al., 2025; Nasution et al., 2025). Educational attainment concentrated at Senior High School (62.3%) and Bachelor's level (19.8%). Visitation was predominantly habitual (29.5% visiting 2–3 times monthly; 16.3% at least weekly), consistent with urban park use patterns across Southeast Asian cities (Luo & Li, 2024; Sasongko et al., 2025), with primary motivations comprising relaxation (30.8%), physical exercise (25.5%), and playing with children (22.0%).

2.4. Measurement instruments and construct operationalization

Step 7 is instrument development. All constructs were operationalized as reflective multi-item indicators on a five-point Likert scale (1 = Strongly Disagree; 5 = Strongly Agree), following established PLS-SEM reflective measurement practice (Hair et al., 2017, 2019). Items were adapted – not directly adopted – from validated sources through a four-stage protocol:

Table 1. Sample distribution across research sites

Research Site	Quantitative Respondents (n)	%	Qualitative Interview Participants (n)	Key Site Characteristics
Kebun Bibit Wonorejo	120	30.0	8	33-ha biodiversity conservation and recreational park; eastern Surabaya; primary RTH node; high ecological density
Taman Kenjeran (Kenjeran Coastal Park)	140	35.0	8	7.2-km longitudinal coastal corridor; northeastern shoreline; integrates nature-based tourism with waterfront infrastructure
Taman Flora Bratang	90	22.5	8	2.3-ha horticultural and botanical park; central Surabaya; high daily visitation; family-oriented facilities; urban biodiversity programming
Other Parks	50	12.5	–	Secondary green destinations (e.g., Taman Bungkul, Taman Prestasi, Taman Mundu); supplementary ecological and sociodemographic coverage
Total	400	100.0	24	Three primary sites + supplementary category

Table 2. Demographic and visitation characteristics of respondents

Characteristic	Category	Kebun Bibit Wonorejo (n = 120)	Taman Kenjeran (n = 140)	Taman Flora Bratang (n = 90)	Other Parks (n = 50)	Total (n = 400)	%
Gender	Male	60	70	45	24	199	49.8
	Female	60	70	45	26	201	50.2
Age	< 18 years	14	17	11	6	48	12.0
	18–25 years	38	44	28	16	126	31.5
	26–35 years	27	32	21	11	91	22.8
	36–45 years	22	26	17	9	74	18.5
	> 45 years	19	21	13	8	61	15.3
Education	Junior High School (SMP)	9	11	7	3	30	7.5
	Senior High School (SMA)	75	87	56	31	250	62.3
	Diploma (D3)	10	12	8	3	33	8.3
	Bachelor's (S1)	24	28	17	10	79	19.8
	Master's/Doctoral (S2/S3)	2	2	2	2	8	2.0
Visitation Frequency	First time	21	24	16	8	69	17.3
	Once a month	27	32	20	11	90	22.5
	2–3 times a month	35	41	27	15	118	29.5
	Once a week	20	23	15	7	65	16.3
	> Once a week	17	20	12	9	58	14.5
Visit Motivation	Relaxation	37	43	28	15	123	30.8
	Physical exercise	31	36	23	12	102	25.5
	Playing with children	26	31	20	11	88	22.0
	Family/friends outing	13	15	11	4	43	10.8
	Photography/social media	5	6	4	1	16	4.0
Other		8	9	4	7	28	6.9

Note: All percentages are calculated within their respective characteristic category and sum to 100%.

(i) initial item generation from source scales;

(ii) expert panel review by three tourism academics and two municipal park officers;

(iii) pilot testing with 45 non-overlapping park visitors; and

(iv) item refinement against Cronbach's Alpha ($\alpha > 0.70$) and corrected item-total correlation (CITC > 0.40) thresholds (Hussain et al., 2023; Manyangara et al., 2025).

Facility quality (FQ; 13 items; pilot $\alpha = 0.946$) was adapted from Suminar et al. (2024), Nasution et al. (2025), Samsudin and Suhalya (2025), and Qiu et al. (2024), with items FQ12–FQ13 specifically developed to capture ecological facility dimensions (Felappi et al., 2024; Chemeda et al., 2025). Service quality (SQ; 7 items; pilot $\alpha = 0.939$) was adapted from SERVQUAL (Parasuraman et al., 1988), SERVPERF (Cronin & Taylor, 1992), and contextual extensions (Pakurár et al., 2019; Garín-Muñoz & Moral, 2017; Luo & Li, 2024; Manyangara et al., 2025). Visitor satisfaction (VS; 6 items; pilot $\alpha = 0.951$) was adapted from Alamasi et al. (2024), Jaafar and Tudin (2010), Han et al. (2021), and Hussain et al. (2023). Visitor loyalty (VL; 5 items; pilot $\alpha = 0.932$) was adapted from Du and Zhao (2022), Zhang et al. (2025), and Sasongko et al. (2025), with item VL5 capturing attitudinal loyalty resistance to competing alternatives (Oliver, 1999). Table A1, Appendix A, specifies the measurement instruments.

Step 8 is translation verification. The questionnaire was developed in Bahasa Indonesia and verified through forward translation, independent back-translation, and research team reconciliation to ensure semantic and contextual equivalence (Manyangara et al., 2025; Munir et al., 2025).

2.5. Model specification and analytical procedure

Step 9 is model specification. The structural model, grounded in the Q-S-L paradigm (Oliver, 1980, 1999), SERVQUAL/SERVPERF (Parasuraman et

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al., 1988; Cronin & Taylor, 1992), and servicescape theory (Bitner, 1992; R. Kaplan & S. Kaplan, 1989), specifies that service quality and facility quality independently predict visitor satisfaction (*H1*, *H2*), which drives visitor loyalty (*H3*), with visitor satisfaction mediating the facility quality → visitor loyalty(*H4*) and service quality→ visitor loyalty (*H5*) pathways.

Step 10 is quantitative analysis sequence (Table 3). PLS-SEM was conducted in SmartPLS 4.0 (Ringle et al., 2022) following a two-stage procedure (Chin, 1998; Hair et al., 2017, 2019, 2021). Stage 1 (Measurement model) evaluated indicator reliability (outer loading $\lambda \geq 0.70$), internal consistency (Cronbach's α and CR > 0.70), convergent validity (AVE > 0.50; Fornell & Larcker, 1981; Poniman et al., 2025), discriminant validity (Fornell-Larcker criterion, cross-loadings, HTMT < 0.95, conservatively < 0.90; Henseler et al., 2015; Hair et al., 2021), and multicollinearity (VIF < 5.0; Hair et al., 2017; Diamantopoulos & Siguaw, 2006). Stage 2 (Structural model) assessed explanatory power (R^2; ≥ 0.25 weak, ≥ 0.50 moderate, ≥ 0.75 substantial; Hair et al., 2019), effect size (f^2; 0.02 small, 0.15 medium, 0.35 large; Cohen, 1988), predictive relevance (Q^2 via blindfolding, D = 7; Chin, 1998), and path significance via bootstrapping (5,000 resamples; one-tailed $p < 0.05$; 95% bias-corrected CIs; Hair et al., 2017, 2019). Mediation effects were decomposed following Preacher and Hayes (2008) and Zhao et al. (2025), with full mediation defined as a significant indirect effect with a non-significant direct effect, and partial mediation when both effects are significant (Hussain et al., 2023; Qiu et al., 2024).

2.6. Qualitative analysis and mixed-methods integration

Step 11 is qualitative coding (Table A2, Appendix A). The qualitative corpus (24 interviews; ≈ 100,800 words; average 4,200 words per transcript) was analyzed via reflexive thematic analysis (Braun & Clarke, 2006, 2019) across six iterative phases: familiarization, initial coding, theme construction, theme review, final theme definition, and integrative reporting. Two independent coders using ATLAS.ti 24 achieved inter-rater reliability of $\kappa = 0.84$, exceeding the 0.80 threshold for strong agreement (Jafar & Ahmad, 2023; Fang & Ko, 2025), with discrepancies resolved through consensus adjudication. Three saturated themes emerged:

1. Ecological authenticity as a trust-building mechanism;
2. Facility cues as Affective satisfaction drivers; and
3. Social embeddedness of loyalty intentions.

Table 3. PLS-SEM analytical procedure and assessment criteria summary

Analysis stage	Evaluation criterion	Threshold / benchmark	Reference(s)
Measurement model	Indicator Reliability	Outer loading $\lambda \geq 0.70$	Hair et al. (2017)
Measurement model	Internal Consistency Reliability	Cronbach's α and Composite Reliability (CR) > 0.70; values ≥ 0.90 = very high consistency	Hair et al. (2017); Hussain et al. (2023)
Measurement model	Convergent Validity	Average Variance Extracted (AVE) > 0.50	Fornell and Larcker (1981)
Measurement model	Discriminant Validity – Fornell-Larcker Criterion	√AVE of each construct must exceed its highest inter-construct correlation	Fornell and Larcker (1981)
Measurement model	Discriminant Validity – HTMT Ratio	HTMT < 0.95; conservative threshold < 0.90 for closely related constructs	Henseler et al. (2015); Hair et al. (2021)
Measurement model	Multicollinearity	Variance Inflation Factor (VIF) < 5.0; maximum permissible VIF < 10.0	Hair et al. (2017); Diamantopoulos and Siguaw (2006)
Structural model	Explanatory Power	$R^2 \geq 0.25$ (weak); ≥ 0.50 (moderate); ≥ 0.75 (substantial)	Hair et al. (2019)
Structural model	Effect Size	$f^2 = 0.02$ (small); 0.15 (medium); 0.35 (large)	Cohen (1988)
Structural model	Predictive Relevance	$Q^2 > 0$ (blindfolding; omission distance D = 7)	Chin (1998); Hair et al. (2019)
Structural model	Path Coefficient Significance	Bootstrapping with 5,000 resamples; one-tailed p < 0.05; 95% bias-corrected confidence intervals	Hair et al. (2017; 2019)
Mediation analysis	Mediation Type	Full mediation: indirect effect significant + direct effect non-significant. Partial mediation: both effects significant. Assessed via indirect/direct effect decomposition	Preacher and Hayes (2008); Zhao et al. (2025)

Step 12 is mixed-methods integration (Table A3, Appendix A). Quantitative and qualitative findings were merged through a joint display matrix (Creswell & Plano Clark, 2018), juxtaposing PLS-SEM path coefficients and effect sizes against convergent qualitative themes and representative quotes. Integration validity was assessed across three criteria – convergence, expansion, and discordance – addressing the limitation of mono-method approaches in capturing phenomenological dimensions such as ecological authenticity and socially embedded loyalty (Jafar & Ahmad, 2023; Tjokrosaputro et al., 2024; Fang & Ko, 2025).

3. RESULTS

3.1. Measurement model assessment

Outer loadings (Table 4) for all indicators exceeded the λ ≥ 0.70 threshold, ranging between 0.705-0.874 (facility quality), 0.784-0.932 (service quality), 0.891-0.931 (visitor satisfaction), and 0.861-0.918 (visitor loyalty) (Hair et al., 2017). Item FQ10 (λ = 0.705) was retained based on its theoretical relevance to the accessibility dimension (Suminar et al., 2024; Chemeda et al., 2025). Internal consistency reliability exceeded 0.90 for all constructs, and convergent validity (AVE) exceeded the 0.50 threshold for all constructs (Hair et al., 2021; Hussain et al., 2023; Poniman et al., 2025; Fornell & Larcker, 1981; Qiu et al., 2024). Discriminant validity was confirmed via the Fornell–Larcker criterion, with all √AVE values exceeding corresponding inter-construct correlations, and HTMT ratios remained below the 0.95 threshold for all construct pairs (Henseler et al., 2015; Hair et al., 2021). Structural model VIF values ranged from 3.813 to 5.701. While one value exceeded the conservative 5.0 threshold, all values remained below the maximum permissible 10.0 threshold (Diamantopoulos & Siguaw, 2006), indicating no severe multicollinearity concern.

3.2. Structural model and hypothesis testing

The structural model (Table 5) explained 82.4% of the variance in visitor satisfaction (R^2 = 0.824) and 78.0% of the variance in visitor loyalty (R^2 = 0.780). Predictive relevance was confirmed via blindfolding, with Q^2 = 0.680 for visitor satisfaction and Q^2 = 0.618 for visitor loyalty (Chin, 1998; Hair et al., 2019). Effect size analysis indicated a large effect of service quality on visitor satisfaction (f^2 = 0.495), a medium effect of facility quality on visitor satisfaction (f^2 = 0.198), and a large effect of visitor satisfaction on visitor loyalty (f^2 = 0.393).

Table 4. Measurement model results: Reliability, convergent validity, and discriminant validity

Construct	Outer Loading Range	Cronbach's α	rho_A	CR	AVE	√AVE
Facility Quality (FQ)	0.705-0.874	0.958	0.960	0.963	0.666	0.816
Service Quality (SQ)	0.784-0.932	0.951	0.953	0.960	0.776	0.881
Visitor Satisfaction (VS)	0.891-0.931	0.959	0.959	0.967	0.831	0.911
Visitor Loyalty (VL)	0.861-0.918	0.939	0.942	0.954	0.805	0.897

Note: CR = Composite Reliability; AVE = Average Variance Extracted. Acceptable thresholds: outer loading λ ≥ 0.70; Cronbach's α and CR > 0.70; AVE > 0.50 (Hair et al., 2017; Fornell & Larcker, 1981). Highest HTMT ratios observed: SQ – VS = 0.930; VL – VS = 0.924 (threshold < 0.95; Henseler et al., 2015). Structural VIF range: 3.813-5.701 (threshold < 5.0; Diamantopoulos & Siguaw, 2006).

Table 5. Structural model and hypothesis testing results

Hypothesis	Path	β	t-value	p-value	f²	Decision
H1	SQ → VS	0.576	7.646	< 0.001	0.495	Supported
H2	FQ → VS	0.364	4.849	< 0.001	0.198	Supported
H3	VS → VL	0.703	8.896	< 0.001	0.393	Supported
H4 (direct effect)	FQ → VL	0.033	0.434	0.332	0.001	Not significant
H5 (direct effect)	SQ → VL	0.166	1.732	0.042	0.022	Significant

Note: Bootstrapping based on 5,000 resamples; one-tailed test (Hair et al., 2017, 2019). R2 = 0.824 (VS); R2 = 0.780 (VL). Q2 = 0.680 (VS); Q2 = 0.618 (VL) (Chin, 1998). FQ = Facility Quality; SQ = Service Quality; VS = Visitor Satisfaction; VL = Visitor Loyalty.

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Table 6. Mediation analysis results

Hypothesis	Path	Indirect β	t-value	p-value	Direct β	p-value	Mediation Type	Decision
H4	FQ → VS → VL	0.256	4.112	< 0.001	0.033	0.332	Full mediation	Supported
H5	SQ → VS → VL	0.405	6.050	< 0.001	0.166	0.042	Partial mediation	Supported

Note: FQ = Facility Quality; SQ = Service Quality; VS = Visitor Satisfaction; VL = Visitor Loyalty.

Moreover, the results report a negligible effect of facility quality on visitor loyalty (f^2 = 0.001) and a small effect of service quality on visitor loyalty (f^2 = 0.022) (Cohen, 1988). Bootstrapped path coefficients (5,000 resamples; one-tailed $p < 0.05$) are reported in Table 5.

3.3. Mediation analysis

Mediation effects (Table 6) were decomposed following Preacher and Hayes (2008) and Zhao et al. (2025). For H4 (FQ → VS → VL), the indirect effect was significant (β = 0.256, t = 4.112, $p < 0.001$) while the direct effect was non-significant (β = 0.033, p = 0.332), indicating full mediation. H4 was supported. For H5 (SQ → VS → VL), the indirect effect was significant (β = 0.405, t = 6.050, $p <$ 0.001) and the direct effect remained significant (β = 0.166, p = 0.042), indicating partial mediation. H5 was supported.

3.4. Qualitative findings

Reflexive thematic analysis (Braun & Clarke, 2006, 2019) of 24 semi-structured interviews (corpus ≈ 100,800 words; κ = 0.84; theoretical saturation reached at interview 22) produced three themes (Jafar & Ahmad, 2023; Fang & Ko, 2025).

Theme 1 is ecological authenticity as a trust-building mechanism. Authentic ecological attributes – native vegetation density, biodiversity, and minimal artificial intervention – were reported by participants as preceding satisfaction formation: "When I see real trees, real birds – not arranged decorations – I feel the city cares about nature. That makes me want to come back" (P07, Kebun Bibit Wonorejo).

Theme 2 is facility cues as affective satisfaction drivers. Physical facility attributes were reported to establish visitors' emotional baseline prior to service encounters: "The moment I enter and see clean pathways, green benches – my mood lifts immediately. Everything after feels better" (P14, Taman Flora Bratang).

Theme 3 is social embeddedness of loyalty intentions. Loyalty was reported as social endorsement – family inclusion, word-of-mouth, and social network recommendation – rather than individual revisit intention alone: "If I really like it here, I don't just come back alone – I want to bring everyone" (P19, Taman Kenjeran).

3.5. Mixed-methods integration

Joint display analysis (Creswell & Plano Clark, 2018) mapped each qualitative theme onto its corresponding hypothesized path(s): Theme 1 was associated with *H1* (SQ → VS) and *H5* (SQ → VS → VL); Theme 2 was associated with *H2* (FQ → VS) and *H4* (FQ → VS → VL); Theme 3 was associated with *H3* (VS → VL) and *H5* (SQ → VS → VL). No discordance between quantitative and qualitative findings was identified across the five hypothesized paths.

4. DISCUSSION

4.1. Theoretical synthesis and contextual significance

The present convergent parallel mixed-methods investigation (Creswell & Plano Clark, 2018) demonstrates that visitor satisfaction functions as the central mediating mechanism through which both service quality and facility quality are converted into visitor loyalty across three Surabaya urban parks. This pattern extends the Q-S-L paradigm (Oliver, 1999) into a non-commercial, ecologically embedded tourism setting that remains underexamined within Indonesian scholarship (Alfarizi et al., 2025; Sasongko et al., 2025; Respati et al., 2025). The triangulated evidence from PLS-SEM (n = 400) and reflexive thematic analysis (24 interviews) indicated that loyalty formation in

this context operates simultaneously at cognitive, affective, and social-relational levels – a multi-layered complexity that mono-method designs are structurally unable to capture (Munir et al., 2025; Jafar & Ahmad, 2023; Fang & Ko, 2025).

The finding that service quality exerts the dominant influence on satisfaction (β = 0.576, f^2 = 0.495) is consistent with the SERVPERF tradition (Cronin & Taylor, 1992; Pakurár et al., 2019), which establishes performance-based service evaluation as a primary satisfaction driver in service settings. This result also converges with Luo and Li (2024) and Manyangara et al. (2025), both of whom report service quality as the strongest satisfaction antecedent in Southeast Asian tourism contexts. Similarly, Thakur and Kumar (2026) identify service delivery quality as decisive for tourist satisfaction. However, the magnitude observed in the present study is notably larger than that typically reported in commercial hospitality research (Hussain et al., 2023; Han et al., 2021), where service quality coefficients on satisfaction tend to cluster in the moderate range. This divergence in magnitude – rather than in direction – suggests that the service quality-visitor satisfaction relationship is not merely replicated but amplified in the urban green tourism setting. Theme 1 (ecological authenticity as a trust-building mechanism) offers a substantive explanation for why this amplification occurs. Visitors do not evaluate staff performance in purely transactional terms, as is typical of commercial service encounters, but instead interpret staff knowledge, responsiveness, and empathy as proxies for the city's broader ecological stewardship. This reinterpretation of service encounters as trust signals – a mechanism absent from prior commercial-hospitality SERVPERF studies – represents a contextual expansion rather than a contradiction of the existing literature (Tjokrosaputro et al., 2024; Fang & Ko, 2025; Li & Du, 2025; Jimenez-García et al., 2025).

The effect of facility quality on satisfaction, while significant, was comparatively modest (β = 0.364, f^2 = 0.198). This finding is broadly aligned with servicescape theory (Bitner, 1992) and Attention Restoration Theory (R. Kaplan & S. Kaplan, 1989; Felappi et al., 2024), both of which theorize physical environment quality as independent, though not necessarily dominant, satisfaction antecedent. The result also corroborates Suminar et al. (2024) and Qiu et al. (2024), who likewise report facility quality as a significant but secondary predictor relative to service-based constructs. By contrast, the present finding diverges from Chemeda et al. (2025), who report facility quality producing comparably large – at times larger – indirect effects relative to service quality in developing-country park contexts characterized by infrastructural deficits. This divergence is plausibly attributable to a contextual difference. Surabaya's municipal parks, particularly Kebun Bibit Wonorejo and Taman Flora Bratang, have already attained relatively mature infrastructural standards (clean pathways, functioning sanitation, adequate signage). Thus, facility quality in this sample functions less as a baseline deficiency-correction mechanism – as it does in infrastructurally constrained settings – and more as an affective enhancement mechanism, consistent with the loading pattern observed for sustainability design (FQ12 = 0.857) and aesthetic appeal (FQ13 = 0.841). Theme 2 (Facility cues as affective satisfaction drivers) substantiates this interpretation by showing that physical cues operate as pre-cognitive, mood-setting stimuli rather than as deficiency signals, which explains why the satisfaction contribution of facility quality, although significant, does not approach the magnitude reported by Chemeda et al. (2025) in less infrastructurally developed settings.

The visitor satisfaction → visitor loyalty path produced the model's largest effect (β = 0.703, f^2 = 0.393), consistent with the well-established primacy of satisfaction within the Q-S-L chain (Oliver, 1999; Garín-Muñoz & Moral, 2017; Du & Zhao, 2022; Zhang et al., 2025; Al Mahruqi et al., 2025). Yet the coefficient observed here sits at the upper end of the range typically reported in destination-loyalty research, where satisfaction-loyalty paths commonly fall between β = 0.45 and β = 0.65 (Garín-Muñoz & Moral, 2017; Du & Zhao, 2022; Leyva-Hernández et al., 2025). This elevated magnitude is not adequately explained by the quantitative model alone. Theme 3 (Social embeddedness of loyalty intentions) supplies the explanatory mechanism, indicating that in Indonesian urban park settings, satisfaction does not translate into loyalty through individual revisit intention alone but is instead channeled through socially constructed endorsement – bringing family members,

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word-of-mouth communication, and digital advocacy. This social-relational amplification is largely absent from Western and East Asian park-loyalty studies, where loyalty instrumentation tends to privilege individual behavioral intention (Respati et al., 2025; Abdilla et al., 2025; Sasongko et al., 2025; Zulvianti et al., 2023). This suggests that the present finding both confirms the general visitor satisfaction → visitor loyalty relationship documented in prior evidence and simultaneously extends it by identifying a culturally specific amplification mechanism that prior instrumentation has structurally underestimated.

A particularly informative result concerns the mediation differential between the two quality antecedents: facility quality is mediated fully by satisfaction (indirect $\beta = 0.256$; direct effect non-significant), whereas service quality is mediated only partially (indirect $\beta = 0.405$; residual direct $\beta = 0.166$, $p = 0.042$). This pattern is directly consistent with Garín-Muñoz and Moral (2017), Chemeda et al. (2025), Kaulu et al. (2025), and Nasution et al. (2025), each of whom report that service quality retains an independent behavioral pathway to loyalty that facility-based quality does not, a distinction theoretically anticipated by Zeithaml et al. (1996). The convergence across these studies – spanning park, heritage, and resort contexts – strengthens confidence that this mediation asymmetry reflects a generalizable structural property of the service quality/facility quality–satisfaction–loyalty system rather than an artifact specific to the Surabaya sample. The qualitative data clarify why this asymmetry persists in the present context. The residual direct service quality → visitor loyalty path appears to be sustained by ecological trust accumulated through repeated high-quality service interactions, which reinforces loyalty independently of momentary satisfaction states. In comparison, facility cues – being affective and experience-bound rather than relationship-bound – generate loyalty exclusively through the satisfaction channel (Manyangara et al., 2025; Preacher & Hayes, 2008; Zhao et al., 2025).

4.2. Theoretical contributions

Taken together, these comparisons yield three theoretical contributions. First, by demonstrating that the Q-S-L paradigm (Oliver, 1999) operates with both consistent direction and context-specific magnitude in publicly managed urban green tourism, this study extends the paradigm beyond commercial hospitality settings. It also incorporates ecological-affective dimensions drawn from servicescape theory (Bitner, 1992) and environmental psychology (R. Kaplan & S. Kaplan, 1989; Zenker & Kock, 2020; Li & Du, 2025; Jimenez-García et al., 2025). Second, mediation is type-contingent (full for facility quality, partial for service quality), and this differential replicates across heterogeneous prior contexts (Garín-Muñoz & Moral, 2017; Chemeda et al., 2025; Kaulu et al., 2025; Nasution et al., 2025). While being mechanistically explained through qualitative data, it advances mediation theory in destination-loyalty research beyond prior studies that documented the pattern without explaining its origin (Preacher & Hayes, 2008; Qiu et al., 2024; Zhao et al., 2025). Third, the paper shows that qualitative mechanisms (ecological trust, affective priming, and social embeddedness) do not merely accompany but actively account for discrepancies in effect magnitude relative to prior quantitative studies. Thus, the findings demonstrate the explanatory value of convergent mixed-methods integration in resolving inconsistencies that mono-method designs leave unaddressed (Creswell & Plano Clark, 2018; Tjokrosaputro et al., 2024; Fang & Ko, 2025; Abdilla et al., 2025).

CONCLUSION

This study aimed to examine how service quality and facility quality influence visitor loyalty through the mediating role of satisfaction in urban green tourism destinations in Surabaya, Indonesia.

The evidence gathered across three Surabaya parks indicates that perceptions of both staff-delivered service and physical facility conditions jointly account for the overwhelming majority of variance in visitor satisfaction, with the service dimension carrying disproportionately greater weight than the facility dimension. Satisfaction, in turn, proved to be the single strongest determinant of loyalty inten-

tions, explaining a substantial share of their variance. Decomposition of the indirect pathways revealed an asymmetric mediating structure: the facility-to-loyalty linkage operates entirely through satisfaction, with no surviving direct effect once satisfaction is accounted for, whereas the service-to-loyalty linkage retains a measurable direct component alongside its indirect route through satisfaction. The accompanying interview-based evidence supplied the experiential logic behind these patterns. It attributed the elevated weight of service perceptions to visitors' tendency to read staff conduct as a marker of ecological stewardship, the exclusivity of the facility-mediated pathway to the priming of an emotional baseline by physical surroundings, and the unusually strong satisfaction-loyalty linkage to loyalty being expressed collectively – through companions, word-of-mouth, and online sharing – rather than as a private, individual disposition.

These results carry a clear practical message. As satisfaction functions as the near-exclusive conduit between facility conditions and loyalty, park authorities cannot expect physical upgrades alone to retain visitors unless those upgrades are experienced as satisfaction-enhancing. Conversely, as service quality retains an independent route to loyalty, investment in front-line staff capability – including ecological literacy alongside interpersonal competence – yields returns that are not fully captured by satisfaction metrics alone (Tjokrosaputro et al., 2024; Fang & Ko, 2025; Bitner, 1992; Chemeda et al., 2025; Kaulu et al., 2025). At a broader governance level, the collective, socially expressed character of loyalty observed in this setting suggests that municipal tourism strategy stands to gain more from embedding satisfaction and ecological-quality monitoring into routine performance audits than from relying on conventional advertising expenditure to stimulate repeat visitation (Respati et al., 2025; Abdilla et al., 2025; Sasongko et al., 2025).

These conclusions should, however, be read within the boundaries imposed by the study's design. The cross-sectional structure of the data cannot speak to whether the satisfaction–loyalty linkage strengthens or weakens as visitors accumulate repeated experiences over time. The geographic concentration of fieldwork within three Surabaya parks restricts confidence in extending these conclusions to cities with different park typologies, infrastructure maturity, or visitor demographics. Self-reported perceptual measures also remain susceptible to recall and social-desirability effects despite the procedural safeguards applied, and the interview sample is unlikely to have adequately represented lower-income visitor segments whose loyalty dynamics may follow a different logic shaped by accessibility and cost constraints.

Future inquiry would benefit from longitudinal designs capable of tracking whether the mediating role of satisfaction intensifies or decays as visit frequency rises. Moreover, it is interesting to assess other Indonesian metropolitan areas – such as Jakarta, Bandung, or Makassar – and comparable Southeast Asian cities – including Bangkok, Ho Chi Minh City, or Kuala Lumpur – to test whether the observed full-versus-partial mediation asymmetry between facility and service quality holds beyond the Surabaya context. Incorporating moderating constructs such as place attachment, ecological consciousness, and destination uniqueness, together with multi-group comparisons between first-time and habitual visitors, would further refine the precision with which managers can target interventions. Finally, given that loyalty in this setting manifested as a socially distributed rather than purely individual construct, subsequent measurement work should expand loyalty instrumentation to explicitly capture social referral intention, group revisitation propensity, and digital advocacy, dimensions that conventional individual-level scales appear to systematically underrepresent in Indonesian urban park contexts.

AUTHOR CONTRIBUTIONS

Conceptualization: Muhammad Hayyu Hani Nuril, Liosten Rianna Roosida Ully Tampubolon.
Data curation: Muhammad Hayyu Hani Nuril, Suyanto.
Formal analysis: Muhammad Hayyu Hani Nuril, Liosten Rianna Roosida Ully Tampubolon.
Investigation: Muhammad Hayyu Hani Nuril.

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Methodology: Muhammad Hayyu Hani Nuril, Suyanto.
Project administration: Muhammad Hayyu Hani Nuril.
Resources: Suyanto, Liosten Rianna Roosida Ully Tampubolon.
Software: Muhammad Hayyu Hani Nuril.
Supervision: Suyanto, Liosten Rianna Roosida Ully Tampubolon.
Validation: Muhammad Hayyu Hani Nuril, Suyanto, Liosten Rianna Roosida Ully Tampubolon.
Visualization: Muhammad Hayyu Hani Nuril.
Writing – original draft: Muhammad Hayyu Hani Nuril.
Writing – review & editing: Suyanto, Liosten Rianna Roosida Ully Tampubolon.

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The quantitative dataset generated and analyzed during this study is available from the corresponding author upon reasonable request, subject to participant confidentiality constraints. Qualitative interview transcripts are not publicly available in order to protect participant anonymity; de-identified thematic summaries are available upon reasonable request to the corresponding author.

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APPENDIX A

Table A1. Measurement instrument summary – Items, sources, and pilot reliability

Construct	Code	Description	Sources	Pilot α
Facility quality	FQ1	The park facilities are clean and well-maintained	Suminar et al. (2024), Nasution et al. (2025)	0.946
	FQ2	The park has adequate and functioning restroom facilities	Suminar et al. (2024), Samsudin and Suhalya (2025)	
	FQ3	Seating areas and shelters are sufficient and comfortable	Nasution et al. (2025), Qiu et al. (2024)	
	FQ4	Walking paths and tracks are well-paved and safe to use	Suminar et al. (2024), Felappi et al. (2024)	
	FQ5	The park provides adequate parking facilities	Nasution et al. (2025), Samsudin and Suhalya (2025)	
	FQ6	Lighting in the park is sufficient for comfort and safety	Qiu et al. (2024), Felappi et al. (2024)	
	FQ7	The park has adequate waste management and trash bins	Suminar et al. (2024), Nasution et al. (2025)	
	FQ8	The park provides clear signage and directional information	Samsudin and Suhalya (2025), Qiu et al. (2024)	
	FQ9	Play areas and recreational equipment are safe and well-maintained	Nasution et al. (2025), Felappi et al. (2024)	
	FQ10	The park is accessible for visitors with disabilities or limited mobility	Suminar et al. (2024), Samsudin and Suhalya (2025)	
	FQ11	Food stalls or refreshment facilities are available and hygienic	Nasution et al. (2025), Qiu et al. (2024)	
	FQ12	Park facilities are designed with environmental and sustainability principles	Felappi et al. (2024), Qiu et al. (2024)	
	FQ13	The park has a strong physical and aesthetic appeal	Felappi et al. (2024), Samsudin and Suhalya (2025)	
Service quality	SQ1	Park staff respond promptly to visitor requests and complaints	Parasuraman et al. (1988), Cronin and Taylor (1992)	0.939
	SQ2	Information such as maps, activity schedules, or directions is clearly available	Pakurár et al. (2019), Luo and Li (2024)	
	SQ3	Park staff are friendly and courteous toward visitors	Parasuraman et al. (1988), Manyangara et al. (2025)	
	SQ4	Park staff demonstrate sufficient knowledge about the park and its facilities	Garín-Muñoz and Moral (2017), Manyangara et al. (2025)	
	SQ5	Park staff are consistently professional in delivering services	Cronin and Taylor (1992), Pakurár et al. (2019)	
	SQ6	Park staff show genuine care and attention toward visitor needs	Parasuraman et al. (1988), Luo and Li (2024)	
	SQ7	Services at this park are reliably consistent across visits	Cronin and Taylor (1992), Garín-Muñoz and Moral (2017)	
Visitor satisfaction	VS1	Overall, I am satisfied with my experience at this park	Alamasi et al. (2024), Han et al. (2021)	0.951
	VS2	This park meets my expectations as a recreational destination	Hussain et al. (2023), Jaafar and Tudin (2010)	
	VS3	I feel comfortable and at ease during my visit to this park	Alamasi et al. (2024), Hussain et al. (2023)	
	VS4	I feel safe throughout my visit to this park	Han et al. (2021), Jaafar and Tudin (2010)	
	VS5	The quality of facilities and services at this park satisfies me	Hussain et al. (2023), Alamasi et al. (2024)	
	VS6	My visit to this park provides a pleasant and enjoyable experience	Han et al. (2021), Jaafar and Tudin (2010)	
Visitor loyalty	VL1	I intend to revisit this park in the future	Du and Zhao (2022), Zhang et al. (2025)	0.932
	VL2	I would recommend this park to family and friends	Sasongko et al. (2025), Oliver (1999)	
	VL3	I would speak positively about this park to others	Du and Zhao (2022), Sasongko et al. (2025)	
	VL4	This park leaves a positive and memorable impression on me	Zhang et al. (2025), Oliver (1999)	
	VL5	I would visit this park even if there were another park closer to me	Oliver (1999), Sasongko et al. (2025)	

Table A2. Qualitative theme summary and integration mapping

Qualitative theme	Theme description	Representative quote (Bahasa Indonesia, anonymized)	Related PLS-SEM path(s)	Convergence / divergence evidence
Ecological authenticity as a trust-building mechanism	Visitors' perception of genuine ecological features – native vegetation, real biodiversity, minimal artificial intervention – functions as a cognitive trust anchor that precedes and amplifies satisfaction formation. Ecological authenticity signals management commitment, extending service quality effects beyond transactional evaluation.	*"Kalau saya lihat pohon-pohon asli, ada burung-burungnya – bukan sekadar dekorasi yang ditata – saya merasa kota ini benar-benar peduli dengan alam. Itu yang bikin saya ingin terus balik ke sini."* (P07, Kebun Bibit Wonorejo)	SQ → VS (H1); VS → VL (H3)	**Convergent + Expansion.** Qualitative data converge with H1 and H3 and expand the mechanism: ecological authenticity explains why staff knowledge and responsiveness generate disproportionate satisfaction responses – they are interpreted as signals of management's ecological commitment, amplifying the SQ→VS path beyond transactional service quality.
Facility cues as affective satisfaction drivers	Physical facility attributes – cleanliness, pathway comfort, aesthetic coherence, sustainable design – operate as affective priming mechanisms that establish visitors' emotional baseline prior to any service encounter. Facility cues generate immediate mood elevation, rendering subsequent park experiences more positively evaluated.	*"Begitu masuk dan lihat jalanan bersih, bangku-bangku hijau – mood saya langsung naik. Semua yang terjadi setelah itu terasa lebih menyenangkan."* (P14, Taman Flora Bratang)	FQ → VS (H2); FQ → VS → VL (H4)	**Convergent + Expansion.** Qualitative findings converge with H2 and H4 and provide the process-level explanation for full mediation: visitors identify with satisfying experiences, not facilities per se, rendering satisfaction the exclusive loyalty conversion mechanism for FQ – thereby explaining why FQ produces full rather than partial mediation through VS.
Social embeddedness of loyalty intentions	Visitor loyalty is not expressed as individual revisit intention alone but as socially constructed endorsement – bringing family and friends, word-of-mouth sharing, and social media recommendation. Satisfaction activates identity-expressive and community-referencing loyalty rather than merely personal behavioral commitment.	*"Kalau saya benar-benar suka di sini, saya nggak cuma balik sendiri – saya pengen ngajak semua orang yang saya kenal buat ikut merasakan."* (P19, Taman Kenjeran)	VS → VL (H3); SQ → VS → VL (H5)	**Convergent with contextual nuance.** Qualitative findings converge with H3 and H5, explaining the magnitude of VS→VL (β = 0.703): social embeddedness amplifies loyalty beyond individual revisit intention, creating a community-referencing loyalty multiplier. Contextual nuance: loyalty expressions in Indonesian urban park settings are inherently collective, suggesting the VL construct's behavioral dimensions carry stronger social loading than individual-level instrumentation fully captures.

Note: Participant anonymization: all qualitative interview participants are identified solely by assigned codes (P01–P24) in accordance with institutional ethical clearance protocols. No personal identifiers were recorded or retained. Convergence indicates that quantitative and qualitative findings point to consistent conclusions; Expansion indicates that qualitative data elaborate mechanisms not fully capturable through Likert-scale instrumentation alone. FQ = Facility Quality; SQ = Service Quality; VS = Visitor Satisfaction; VL = Visitor Loyalty.

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Table A3. Joint display – Mixed-methods integration matrix

Hypothesis / Path	Path Coefficient (β)	t-value	p-value	Quantitative Decision	Convergent Qualitative Theme(s)	Qualitative Contribution
H1: SQ → VS	0.576	7.646	< 0.001	Supported	Theme 1 – Ecological Authenticity as a Trust-Building Mechanism; Theme 3 – Social Embeddedness of Loyalty Intentions	Convergence + Expansion. Responsive, knowledgeable, and empathetic staff are interpreted by visitors not merely as service providers but as signals of management's ecological commitment, amplifying SQ's satisfaction effect beyond what transactional service evaluation alone explains.
H2: FQ → VS	0.364	4.849	< 0.001	Supported	Theme 2 – Facility Cues as Affective Satisfaction Drivers	Convergence. Physical facility attributes – cleanliness, pathway comfort, sustainable design – function as affective priming mechanisms that establish visitors' emotional baseline prior to service encounters, confirming FQ as an independent satisfaction antecedent operating through an affective rather than cognitive route.
H3: VS → VL	0.703	8.896	< 0.001	Supported	Theme 3 – Social Embeddedness of Loyalty Intentions	Convergence + Expansion. The magnitude of VS→VL is explained qualitatively by the social construction of loyalty: satisfaction activates community-referencing and identity-expressive loyalty – bringing family and friends, word-of-mouth, social media recommendation – amplifying the path coefficient beyond what individual-level revisit intention instrumentation fully captures.
H4: FQ → VS → VL (indirect)	0.256	4.112	< 0.001	Supported (full mediation)	Theme 2 – Facility Cues as Affective Satisfaction Drivers	Expansion. Full mediation is explained by the affective priming process: visitors identify with satisfying experiences rather than with facilities per se, rendering satisfaction the exclusive loyalty conversion mechanism for FQ. Ecological authenticity of facility design further reinforces why no direct FQ→VL path bypasses satisfaction.
H5: SQ → VS → VL (indirect)	0.405	6.050	< 0.001	Supported (partial mediation)	Theme 1 – Ecological Authenticity as a Trust-Building Mechanism; Theme 3 – Social Embeddedness of Loyalty Intentions	Convergence. Partial mediation is explained by the dual mechanism of service quality: satisfaction mediates the primary loyalty pathway, while the residual direct SQ→VL path is sustained by ecological trust built through high-quality service interactions – independently reinforcing loyalty beyond satisfaction formation and corroborating Theme 1's trust-building mechanism.

Note: All reported indirect effects (H4, H5) were decomposed following Preacher and Hayes (2008) and Zhao et al. (2025). Convergence = quantitative and qualitative findings point to consistent conclusions. Expansion = qualitative data elaborates process-level mechanisms not fully capturable through Likert-scale instrumentation. Discordance = conflicting findings warranting further investigation. No discordance was identified across the five hypothesized paths. FQ = Facility Quality; SQ = Service Quality; VS = Visitor Satisfaction; VL = Visitor Loyalty.