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Maintenance, Safety, and Sustainability as Interdependent Dimensions of Seasonal Tourism Destination Management

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Abstract- Seasonal tourism destinations rely on a complex mix of physical infrastructure, visitor protection systems, and sustainability-oriented management practices. Despite their practical relationships, maintenance, safety, and sustainability are often assessed as individual constructs within destination governance and tourism research. This separation blurs the understanding of how operational decisions made on one area of the construct affects outcomes in another, especially in places experiencing periodic increases in visitors.

This study investigates the relationships among maintenance practices, safety measures, and sustainability initiatives within selected tourism destinations in the Kwahu area of Ghana. A quantitative cross-sectional survey design was used to collect data from 223 destination users across five ecologically and culturally significant tourism sites. Spearman correlation, multiple regression, and bootstrapped mediation procedures were used to analyse the Data.

Analysis of the data shows statistically significant positive associations among all three constructs. Maintenance practices were positively associated with both safety measures ($\beta = 0.433$, $p < 0.001$) and sustainability initiatives ($\beta = 0.429$, $p < 0.001$). Safety measures revealed the strongest direct relationship with sustainability outcomes ($\beta = 0.532$, $p < 0.001$). Maintenance and safety accounted for 34.8% of the variance in sustainability initiatives ($R^2 = 0.348$) when examined together. Safety partly transmitted the effect of maintenance on sustainability, representing approximately 35% of the total relationship between the two variables ($\beta = 0.164$, 95% BCa CI [0.065, 0.158], $p < 0.001$) when Mediation analysis was further conducted.

These results suggest that sustainability programmes and the quality of supporting operational systems influence sustainability performance in seasonal tourism destinations. Instead of functioning as an autonomous management concerns, maintenance, safety, and sustainability seem to form a mutually reinforcing operational network. The study provides empirical evidence from a Sub-Saharan African tourism context and explains the importance of integrated destination management approaches capable of addressing infrastructure quality, visitor safety, and sustainability objectives simultaneously.

Keywords: Infrastructure Maintenance; Safety Management; Sustainable Tourism; Destination Governance; Systems Theory; Seasonal Tourism; Ghana

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INTRODUCTION

Tourism has become very important part of economic development strategies across the globe, providing employment avenues, stimulating local enterprise development, and bolstering investment in infrastructure and public services. Tourism also promotes environmental responsibility, cultural preservation, and community empowerment aside its economic significance (Ursache, 2015; Streimikiene et al., 2021). This makes effective destination management a critical issue for governments, local authorities, and industry stakeholders. As a results, attention has shifted from simply attracting visitors to ensuring the long-term quality, safety, and sustainability of their experience as tourism destinations become more competitive (Hsieh and Kung 2020; Laphet et al. 2025).

However, there are certain challenges present in tourism destination characterised by periodic increases in the number of visitors. These include tourism infrastructure subjected to intensified use and environmental stresses increasing during peak periods. At the same time, destination managers face greater responsibility for ensuring visitor safety while maintaining service quality (Boamah, 2014; Gyasi et al., 2022). Under such conditions, operational defects that might remain hidden during normal periods can become highly visible and potentially damaging during peak periods marked by increases in visitors. Inadequate safety arrangements, failures in infrastructure maintenance or poorly implemented sustainability initiatives can reduce visitor satisfaction, weaken destination competitiveness, as well as compromise long-term development objectives (Font & Harris, 2004; Mihalic, 2016).

Although maintenance, safety, and sustainability are commonly addressed through separate administrative, policy and research frameworks, they are also frequently recognised as important parts of destination performance. Literature on Infrastructure maintenance often focuses on service quality and destination accessibility (Tyllianakis, 2024); whilst that of Safety has largely discussed risk perception, visitor behaviour, and destination image (Reisinger & Mavondo, 2005; Xie et al. 2021; Ding and Wu 2022; Mawby & Ozascilar, 2024; Laphet et al. 2025). Sustainability scholarship, in contrast, has concentrated on environmental conservation, social responsibility, and economic viability (Mowforth & Munt, 2015; Dangi & Jamal, 2016; Grandcourt, 2020; Mihalic, 2020; Cavallin Toscani et al., 2024). While these bodies of literature have generated important insights, they have generally developed along parallel trajectories. This provides limited understanding of how these operational domains interact within tourism destinations.

The consequences of this separation go beyond academic debate. Deteriorating infrastructure may undermines environmental performance or visitor confidence when sustainability programmes fail to achieve intended results (Eccles et al., 2014; Hahn et al., 2015; Geissdoerfer et al., 2017; Ibe et al., 2025). Similarly, safety initiatives may become less effective when maintenance deficiencies increase operational risks (Cheng et al., 2022; Othman et al. 2024) while destinations that pursue sustainability goals without considering the supporting roles of maintenance and safety may also encounter difficulties translating policy commitments into practical outcomes. Understanding how these dimensions influence one another is consequently crucial for theoretical development, destination planning and resource allocation.

The Kwahu tourism area provides a particularly relevant setting for examining these issues. The area has become one of the most prominent seasonal tourism destinations in Ghana, attracting large numbers of visitors from the country and abroad during the annual Easter celebrations. Tourism activities in Kwahu combine cultural events, heritage attractions, natural landscapes, and adventure-based experiences, most notably paragliding activities at Odweanoma Mountain (Aninakwah, 2022; Gyasi et al., 2022). The increase in the number of visitors during the Easter festival period places substantial pressure on transportation networks, public utilities, emergency services, recreational facilities, and environmental resources (Boamah, 2014; Gyasi et al., 2022). Therefore, coordinated attention to safety preparedness, infrastructure condition, and sustainability considerations are required to managing these pressures

Recent studies have documented the socio-cultural and economic significance of tourism activities in the Kwahu area (Boamah, 2014; Aninakwah, 2022; Gyasi et al., 2022). However, the operational systems that support destination performance during periods of intense visitor concentration has been given limited attention. Existing literature has tended to assess festival impacts, tourism development, and visitor motivations independently (Boamah, 2014; Aninakwah, 2022; Gyasi et al., 2022). Leaving unanswered questions regarding the relationships among maintenance quality, safety performance, and sustainability outcomes. This gap is particularly important within the tourism contexts of Sub-Saharan African, where resource constraints often require difficult decisions regarding infrastructure investment and destination management priorities.

From a theoretical perspective, systems theory provides a useful lens for understanding these relationships (Farrell & Twining-Ward, 2004; McKercher, 1999). The theory views destinations as interconnected systems made up of multiple interacting parts whose joint effects shape overall performance. Within such a framework, maintenance, safety, and sustainability are not isolated management functions but interdependent elements of a broader operational system.

Changes in one component can affect the performance of others. Creating outcomes that cannot be fully explained by examining individual elements independently. Sustainable tourism management frameworks reinforce this perspective by emphasising the need to balance environmental, social, and economic objectives through coordinated management practices (Butler 1999; Swarbrooke 1999; Weaver 2006; Grandcourt, 2020).

Against this background, this study examines the structural relationships among maintenance practices, safety measures, and sustainability initiatives within selected tourism destinations in the Kwahu tourism enclave. Specifically, the study investigates whether maintenance influences sustainability directly, whether safety contributes independently to sustainability outcomes, and whether safety functions as an intermediary mechanism through which maintenance affects sustainability performance. The study seeks to advance understanding of operational interdependency in tourism destinations by addressing these questions. It also contributes empirical evidence from a seasonal tourism context that remains underrepresented in the broader destination management literature

The findings provide findings that are relevant to both scholarship and practice. For destination managers and policymakers, it highlights the potential benefits of moving beyond fragmented management approaches towards more integrated strategies capable of simultaneously improving infrastructure quality, visitor safety, and sustainability performance. For researchers, the study offers evidence regarding the interconnected nature of operational systems within tourism destinations.

LITERATURE REVIEW

Sustainability In Tourism Destination Management

Sustainability has become one of the most influential concepts in contemporary tourism scholarship, reflecting growing concern about the long-term environmental, social, and economic consequences of tourism development (Mowforth & Munt, 2015; Dangi & Jamal, 2016; Giampiccoli & Saayman, 2018; Grandcourt, 2020; Mihalic, 2020; Scheyvens & Van der Watt, 2021; Cavallin Toscani et al., 2024). As destinations increasingly compete for visitors while confronting challenges such as environmental degradation, resource scarcity, overtourism, and climate-related risks, sustainability has evolved from a peripheral policy objective into a central consideration in destination planning and governance (Ursache, 2015; Streimikiene et al., 2021. Within tourism studies, sustainability is generally understood as the pursuit of development pathways that satisfy present tourism needs without compromising the ability of future generations to benefit from destination resources (Butler 1999; Swarbrooke 1999; Weaver 2006; Giampiccoli & Saayman, 2018; Buame & Opoku, 2019; Scheyvens & Van der Watt, 2021).

Research on sustainable tourism has traditionally focused on balancing economic growth with environmental conservation and community well-being. This perspective is reflected in the widely adopted triple-bottom-line approach, which emphasises economic viability, environmental responsibility, and social equity as interconnected dimensions of destination performance (Butler, 1999; Swarbrooke, 1999; Weaver, 2006). International organisations such as the UNWTO have further institutionalised this perspective by promoting destination assessment frameworks that incorporate indicators related to environmental protection, community participation, cultural preservation, and economic resilience (Grandcourt, 2020).

Within event and festival tourism, sustainability has received increasing scholarly attention because of the substantial pressures that temporary visitor concentrations can place on host communities and local ecosystems. Research has shown that festivals can generate significant economic benefits, strengthen place identity, and contribute to regional development when managed responsibly (Getz & Page, 2019; Jung et al., 2024; Ilieva et al., 2024). At the same time, scholars have highlighted concerns regarding waste generation, resource consumption, environmental degradation, and community disruption associated with poorly managed tourism events. Consequently, sustainability has become a key criterion for evaluating the long-term success of tourism destinations and festivals.

Despite these advances, an important limitation remains evident within much of the sustainability literature. Sustainability is frequently examined as a policy aspiration, strategic objective, or performance outcome rather than as a condition emerging from the interaction of everyday operational processes. As Mair and Smith (2021) observe, improving sustainability outcomes often requires more than the adoption of sustainability programmes or environmental initiatives; it requires attention to the organisational and operational systems that shape destination performance. Yet relatively little research has explored how operational functions such as infrastructure maintenance and safety management contribute to sustainability outcomes.

This omission is particularly relevant in developing-country contexts. Studies from Sub-Saharan Africa and Southeast Asia suggest that tourism destinations often face institutional, financial, and infrastructural constraints that affect their

capacity to implement sustainability initiatives effectively (Eshun & Asiedu, 2023; Nguyen et al., 2024; Kurniawan & Khademi-Vidra, 2024). Under such conditions, sustainability outcomes may depend heavily on the quality of supporting operational systems. Understanding these relationships therefore represents an important step towards a more integrated conception of sustainable destination management.

Infrastructure Maintenance In Tourism Settings

Although tourism researchers have long recognised the importance of infrastructure for destination competitiveness, considerably less attention has been devoted to the ongoing management and maintenance of tourism assets. Infrastructure is commonly discussed in relation to accessibility, transportation, accommodation capacity, and visitor services, yet the operational processes required to sustain these assets over time often remain in the background of tourism scholarship.

Existing research consistently demonstrates that infrastructure quality influences visitor satisfaction, destination attractiveness, and tourism demand (Dwyer & Kim, 2003; Asmelash & Kumar, 2019; Nguyen, 2021). Well-maintained facilities improve accessibility, enhance visitor experiences, and contribute to perceptions of destination quality. Conversely, deteriorating infrastructure can negatively affect destination image, reduce visitor confidence, and increase operational costs (Cheng et al., 2022; Othman et al., 2024). These relationships are especially important in destinations where tourism activities depend heavily on public facilities, transportation systems, recreational infrastructure, and environmental assets.

Maintenance management literature provides useful insights into these dynamics. Rather than viewing maintenance solely as a corrective response to infrastructure failure, contemporary maintenance theory conceptualises it as a strategic process designed to preserve asset functionality, extend service life, and minimise operational disruptions (Pintelon & Van Puyvelde, 2006). Preventive maintenance approaches seek to address potential problems before failures occur, whereas corrective maintenance focuses on restoring functionality after breakdowns have already affected performance. Research across multiple sectors indicates that preventive approaches generally yield superior long-term outcomes through reduced costs, improved reliability, and enhanced operational efficiency (Eccles et al., 2014).

Recent scholarship has also linked maintenance practices to broader sustainability objectives. Studies grounded in circular economy principles suggest that systematic maintenance can reduce material waste, improve resource efficiency, and prolong asset lifecycles, thereby contributing directly to environmental sustainability goals (Geissdoerfer et al., 2017; Ibe et al., 2025). Similarly, Ghaleb and Taghipour (2023) found consistent evidence that maintenance quality influences asset sustainability across diverse organisational settings.

Despite these insights, tourism research has rarely examined maintenance as a factor that extends beyond infrastructure quality to influence other dimensions of destination performance. In particular, limited attention has been paid to the possibility that maintenance practices shape safety conditions and sustainability outcomes simultaneously. As a result, maintenance is often treated as a technical or operational concern rather than as an integral component of broader destination governance systems. Addressing this gap requires greater attention to the ways in which infrastructure management interacts with other operational functions within tourism destinations.

Safety In Tourism And Destination Competitiveness

Safety occupies a central position in tourism decision-making because perceptions of risk influence destination choice, visitor satisfaction, and travel behaviour. Tourism activities frequently involve unfamiliar environments, temporary mobility, and varying levels of physical, social, and environmental risk. Consequently, destinations that are perceived as safe generally enjoy stronger reputations and greater visitor confidence than destinations associated with uncertainty or insecurity (Laphet et al. 2025; Kung 2020).

A substantial body of tourism research has demonstrated that safety perceptions shape destination image and behavioural intentions. Visitors who perceive a destination as safe are more likely to visit, recommend the destination to others, and return in the future (Reisinger & Mavondo, 2005; Ding & Wu, 2022). Safety considerations have therefore become an important component of destination competitiveness and marketing strategies.

The multidimensional nature of tourism safety has also received increasing attention. Xie et al. (2021) identified several factors contributing to tourists' perceptions of safety, including environmental conditions, facility adequacy, management responsiveness, and the broader social environment. These findings suggest that safety extends beyond emergency response capabilities to encompass the overall quality of destination management systems.

The importance of safety becomes even more pronounced in adventure tourism settings, where visitors voluntarily engage in activities involving elevated levels of physical risk. In such environments, effective safety management depends on reliable infrastructure, specialised equipment, trained personnel, and clearly defined operational procedures (Pizam & Mansfeld, 2006). Failures in any of these components can have significant consequences for visitor welfare, organisational reputation, and destination sustainability.

Recent scholarship has begun to recognise connections between safety and sustainability. Laphet et al. (2025) argue that safety culture forms an important foundation for the long-term sustainability of tourism organisations because it promotes responsible behaviour, institutional accountability, and stakeholder trust. Nevertheless, empirical evidence explaining how safety contributes to sustainability outcomes remains limited. Existing studies have primarily focused on visitor perceptions and behavioural consequences, leaving unanswered questions regarding the operational mechanisms through which safety influences broader destination performance.

An additional gap concerns the relationship between safety and infrastructure maintenance. Although well-maintained facilities are generally assumed to enhance safety conditions, relatively few tourism studies have investigated this relationship directly. Consequently, the role of safety as a potential intermediary linking maintenance quality to sustainability outcomes remains insufficiently understood.

RESEARCH HYPOTHESES AND CONCEPTUAL MODEL

Research Hypotheses

The preceding review suggests that maintenance, safety, and sustainability are conceptually related but have largely been investigated within separate strands of tourism scholarship. Existing evidence indicates that maintenance influences infrastructure quality and operational reliability, safety affects visitor confidence and destination performance, and sustainability reflects broader environmental, social, and economic outcomes. However, limited empirical research has examined how these dimensions interact within a unified operational framework.

Drawing on these theoretical insights, the study proposes the following hypotheses:

H1: Maintenance practices positively predict safety measures.

H2: Maintenance practices positively predict sustainability initiatives.

H3: Safety measures positively predict sustainability initiatives.

H4: Maintenance practices and safety measures jointly predict sustainability initiatives.

H5: Safety measures mediate the relationship between maintenance practices and sustainability initiatives.

Conceptual Model and Theoretical Foundation

The conceptual framework underpinning this study is informed by systems theory and sustainable tourism management principles. Together, these perspectives provide a basis for understanding how maintenance, safety, and sustainability may function as interconnected components of destination management.

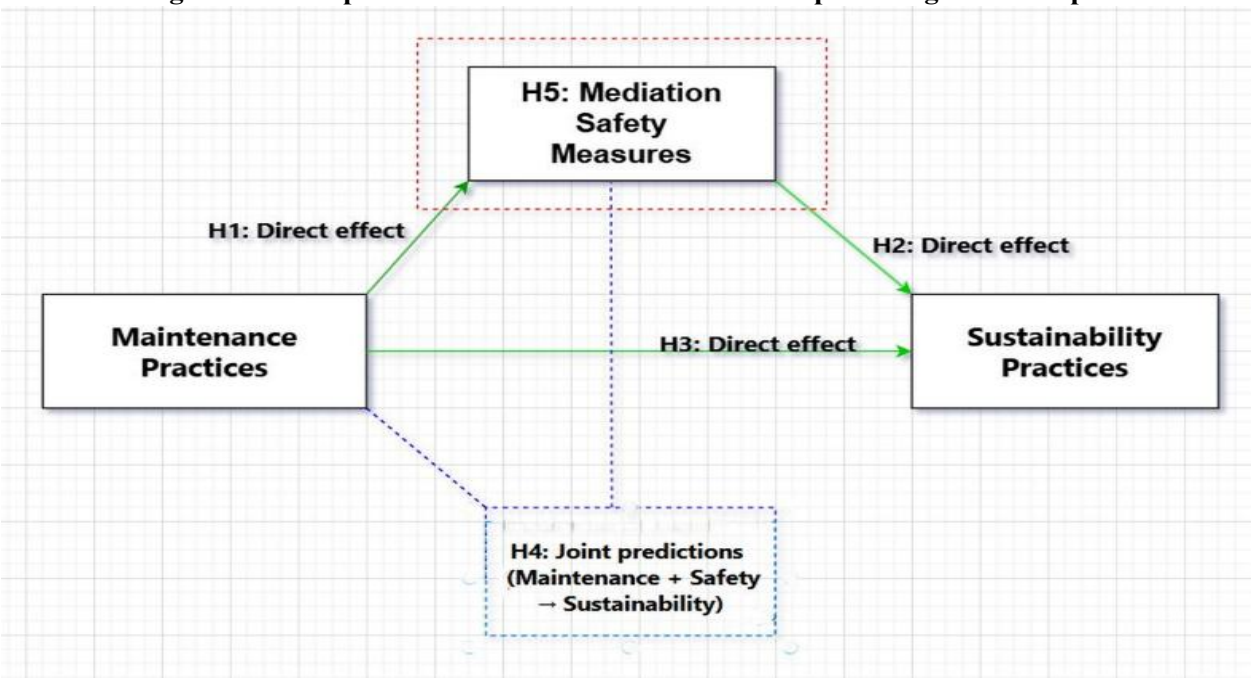
Systems theory views organisations and social environments as collections of interdependent elements whose interactions shape overall system performance (von Bertalanffy, 1950; Checkland, 1994; Jackson, 2016). Within tourism destinations, infrastructure, human resources, governance arrangements, environmental conditions, and visitor activities operate as interconnected subsystems rather than independent entities. Outcomes observed at the destination level emerge from interactions among these components rather than from the influence of any single factor acting alone.

This perspective has particular relevance for tourism destinations characterised by seasonal demand fluctuations. During peak tourism periods, increased visitor numbers place simultaneous pressure on infrastructure, safety systems, environmental resources, and management capacity. Under such circumstances, weaknesses within one subsystem can create consequences that extend throughout the broader destination system. Deteriorating infrastructure, for example, may increase safety risks, reduce visitor satisfaction, and undermine sustainability objectives. Conversely, improvements in one operational area may generate positive effects across multiple dimensions of destination performance.

Sustainable tourism management complements this systems perspective by providing a normative framework for evaluating destination outcomes. Sustainable tourism approaches emphasise the need to balance economic development with environmental stewardship and social responsibility while ensuring the long-term viability of tourism resources (Butler, 1999; Swarbrooke, 1999; Weaver, 2006). Within this framework, maintenance and safety are not merely supporting functions; they represent operational conditions that influence the extent to which sustainability objectives can be achieved.

Integrating these perspectives suggests that sustainability outcomes are likely to emerge from the interaction of multiple operational systems rather than from sustainability initiatives alone. Maintenance practices help preserve infrastructure quality and operational reliability. Safety measures contribute to visitor protection, stakeholder confidence, and institutional resilience. Together, these functions may create conditions that support stronger sustainability performance. The conceptual model therefore positions maintenance as a foundational operational factor, safety as both an independent and intermediary mechanism, and sustainability as the broader outcome of these interconnected processes.

Figure 1: Conceptual Model of Structural Relationships Among the Concepts



METHODOLOGY

Objective Definition

The study is designed to demonstrate the functional, empirical, and applied utility of an integrated operational framework for seasonal tourism destination. Three specific problems motivate the demonstration: (i) the analytical fragmentation of maintenance, safety, and sustainability in destination management scholarship and practice; (ii) the absence of empirical evidence on their structural interdependencies in Sub-Saharan African festival tourism contexts; and (iii) the consequent inability of destination managers and policymakers to make integrated, evidence-based investment decisions across these operational domains. The key features highlighted through this demonstration are the quantified structural relationships among maintenance, safety, and sustainability; the identification of safety as a partial mediator in the relationship between maintenance and sustainability; and the practical applicability of a systems-theoretic integrated framework to seasonal festival tourism governance in Ghana.

Measurable success criteria were defined a priori as follows:

(i) statistically significant relationships ($p < 0.05$) among all three construct pairs.

(ii) a combined regression model explaining at least 25% of variance in sustainability outcomes.

(iii) a statistically significant bootstrapped indirect effect confirming safety-mediated transmission of the relationship between maintenance and sustainability. These criteria were established prior to data collection to guard against post-hoc rationalisation of results.

Scenario Development

Five destination scenarios were developed to represent the operational diversity of the Kwahu tourism area and to replicate the common challenges faced by destination managers in seasonal festival tourism contexts. Each scenario presents a distinct combination of maintenance demands, safety risk profiles, and sustainability pressures, ensuring that the framework's generalisability across tourism product types could be assessed within a single destination region. All scenarios were validated against real-world destination conditions through field reconnaissance prior to data collection

Scenario A. Adventure Tourism: Odweanoma Paragliding Field (849m elevation). Represents compound safety challenges in high-risk recreational environments, where maintenance of specialised equipment and institutional safety

protocols are operationally inseparable. This scenario replicates the challenge faced by managers of adventure tourism assets where safety failures carry reputational and regulatory consequences.

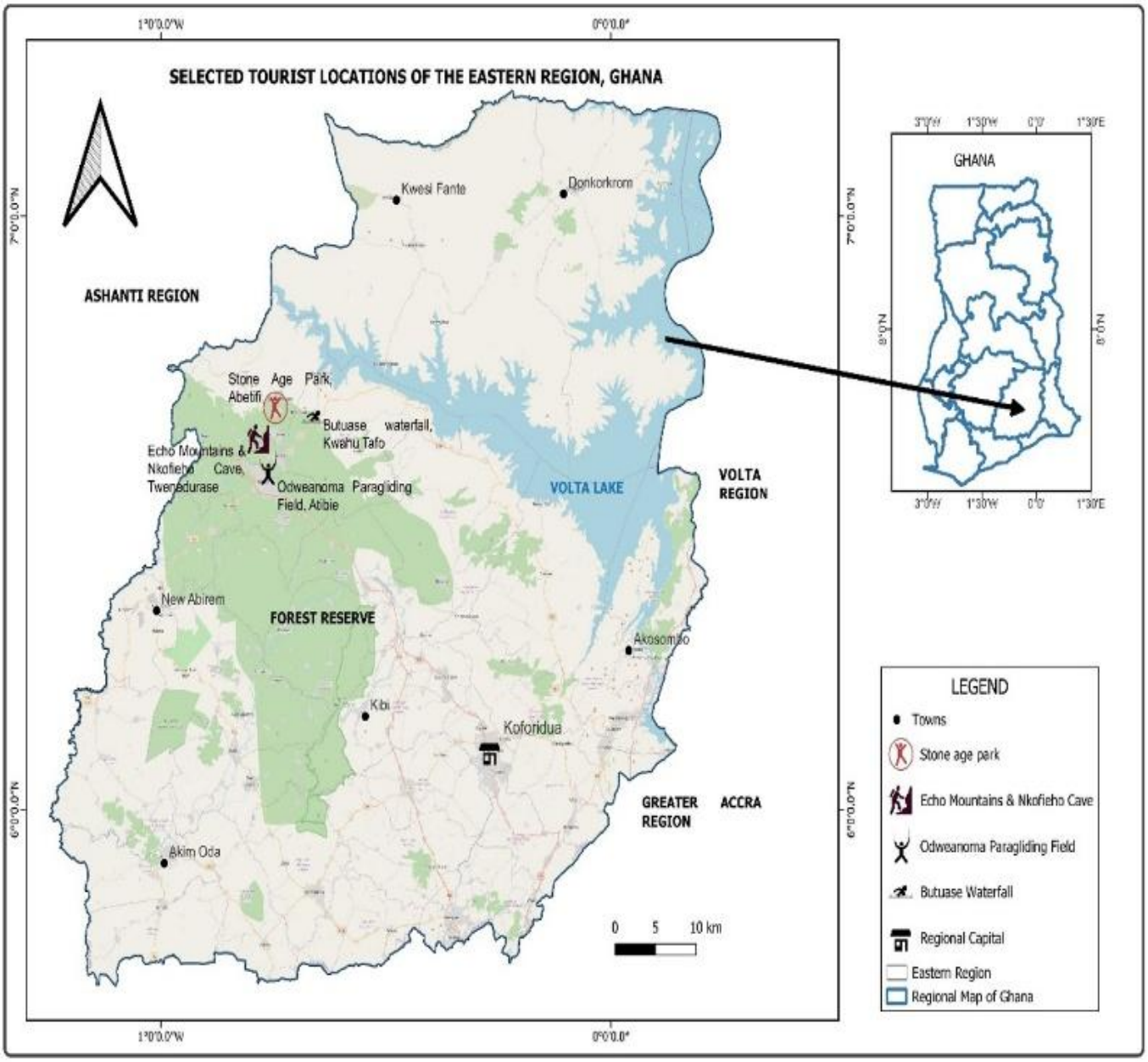
Scenario B. Archaeological Heritage: Abetifi Stone Age Park (52 acres). Represents the challenge of maintaining heritage infrastructure of irreplaceable cultural value while managing visitor access safely and sustainably. Maintenance neglect in this context carries irreversible environmental and cultural costs.

Scenario C. Spiritual and Natural Heritage: Nkofieho Cave. Represents difficult-terrain destinations where physical access infrastructure is simultaneously a safety requirement and a visitor experience determinant. Maintenance and safety investment are operationally inseparable.

Scenario D. Natural Heritage with Acoustic Features: Echo Mountains. Represents a destination where the primary attraction is environmental, placing sustainability under direct operational pressure from visitor density during festival season.

Scenario E. Water-Based Natural Heritage: Butuase Waterfall. Represents a destination with environmental fragility, where maintenance of surrounding infrastructure directly affects ecological sustainability outcomes and visitor safety simultaneously. Together, these five scenarios span adventure tourism, archaeological heritage, spiritual heritage, natural heritage, and water-based tourism, enabling examination of the integrated framework across the full operational diversity of seasonal festival destinations.

Figure 2: Map of Selected Study Sites in the Kwahu Tourism Area



Setup and Configuration

Research Design

A quantitative cross-sectional survey design was employed within a positivist epistemological framework, enabling systematic, replicable measurement of structural relationships among the core constructs (Creswell & Creswell, 2017; Jennings, 2018). This design was selected as the most appropriate configuration for demonstrating the hypothesised interdependencies with the statistical precision necessary for policy-relevant conclusions. All constructs were operationalised as visitor and resident perceptual evaluations of destination management quality, reflecting the experiential knowledge that destination users possess regarding how maintenance, safety, and sustainability practices are enacted at the site level.

Instrument Configuration

All items employed a five-point evaluative Likert-type scale ranging from 1 (very poor) to 5 (excellent). Maintenance practices were measured using 14 items grounded in maintenance management theory (Pintelon & Van Puyvelde, 2006), addressing preventive maintenance, corrective maintenance, maintenance planning, and effectiveness. Safety measures were assessed through 14 items informed by tourism-specific safety frameworks (George, 2003; Ding & Wu, 2022), encompassing perceived safety equipment availability, accident prevention procedures, and safety policy implementation. Sustainability practices were measured using 14 items drawing from sustainable tourism and triple bottom line frameworks (Font & Harris, 2004; Mihalic, 2016, 2020). The questionnaire was developed through systematic literature review, item generation, expert review, and pilot testing (Hinkin, 1998; DeVellis & Thorpe, 2021).

Table 1: Measurement Instruments Summary

Variable	Items	Source Frameworks
Maintenance Practices	14	Pintelon & Van Puyvelde (2006)
Safety Measures	14	George (2003); Ding & Wu (2022)
Sustainability Initiatives	14	Font & Harris (2004); Mihalic (2016, 2020)

Validation

Content validity was established through expert review involving academics and practitioners in tourism management and facilities management (Wynd et al., 2003), with items revised based on feedback prior to deployment (Hardesty & Bearden, 2004). Internal consistency reliability was pre-tested through pilot administration, with all three scales confirmed at acceptable or good reliability levels ($\alpha \geq .76$) before full data collection commenced. Cronbach's alpha values $\geq .70$ were considered acceptable and $\geq .80$ considered good (Cronbach, 1951; Tavakol & Dennick, 2011).

Data Environment and Analytical Platform

Data were collected across all five destination sites during the Kwahu Easter Festival (March 2025), ensuring that inputs reflected genuine peak-season. A minimum sample of 200 was targeted based on a priori power analysis for multiple regression with medium effect sizes (Faul et al., 2007; Cohen, 2013), ensuring statistical power exceeding 0.80 at $\alpha = 0.05$. The final validated sample of 223 complete responses confirmed adequate configuration for all planned analyses (Hair et al., 2019). Cases with more than 20% missing data were excluded (Schafer & Graham, 2002). Data analysis was conducted using Stata 16, with sequential analytical stages pre-specified: descriptive statistics, Spearman bivariate correlation, simple and multiple linear regression, and bootstrapped mediation analysis using 5,000 replications with BCa confidence intervals (Preacher & Hayes, 2008). Supplementary one-way ANOVAs with Tukey post-hoc tests were configured to examine group-level variation across tertile-defined performance levels.

The study was granted ethical approval by the Ethics Review Committee of Takoradi Technical University, Centre for Research, Innovation and Development (Ref. No. TTU/ERC/25/022; 20th April 2025). All procedures were conducted in strict accordance with the committee's stipulated ethical guidelines, including informed consent, participant confidentiality, and data integrity. Participants were assured of the voluntary nature of their involvement and the anonymisation of all data. The study was conducted without deviation from the approved protocol for the research project.

Step-by-Step Execution

The demonstration of the integrated framework proceeded through four sequential stages:

- **Introduction:** The context of the Kwahu Plateau was introduced, situating the study within the Easter Festival's seasonal demand structure and establishing the relevance of the five destination scenarios for destination managers, tourism policymakers, and governance researchers in Ghana and Sub-Saharan Africa.
- **Feature Showcase:** The unique value proposition of the integrated framework was demonstrated through three sequential analytical showcases. First, simple regression models established the individual predictive relationships among constructs (Showcase 1: Maintenance → Safety; Showcase 2: Maintenance → Sustainability; Showcase 3: Safety → Sustainability). Second, the multiple regression model demonstrated the combined and additive effects of maintenance and safety on sustainability outcomes. Third, bootstrapped mediation analysis revealed the mechanism. The safety pathway through which maintenance investment translates into sustainability performance.
- **Interactive Engagement:** ANOVA results were structured to enable destination practitioners to locate their operational context within the performance tertile framework. High, medium, and low maintenance and safety performance groups were presented with corresponding sustainability outcome profiles, enabling destination managers to assess their current position and identify targeted improvement priorities relevant to their specific scenario. The demonstration concluded with an integrated presentation of how the five destination scenarios connect to the empirical findings, showing how the framework applies across adventure tourism, heritage tourism, and natural heritage contexts within the Kwahu area

Data Collection

Data collection was undertaken during a period of active tourism visitation within the Kwahu destination area. Respondents were approached at selected tourism sites and invited to participate voluntarily in the study. Before completing the questionnaire, participants were informed about the purpose of the research and assured that their responses would remain anonymous and confidential. Questionnaires were administered on-site to ensure that respondents could draw upon recent experiences when evaluating destination conditions. This approach reduced the likelihood of recall bias and improved the contextual relevance of participant responses. Participation was entirely voluntary, and respondents were free to withdraw at any stage without consequence. Completed questionnaires were screened for completeness before inclusion in the final dataset.

Evaluation and Iteration

The demonstration framework was evaluated against the three pre-specified success criteria defined in Phase 1. All three criteria were met: all pairwise construct relationships were statistically significant at $p < 0.001$, exceeding the $p < 0.05$ threshold; the combined regression model explained 34.8% of variance in sustainability outcomes, exceeding the 25% target; and bootstrapped mediation confirmed a significant indirect effect ($\beta = 0.164$, BCa 95% CI [0.065, 0.158], $p < 0.001$). The framework therefore performed as theoretically specified under peak-season conditions. Areas identified for iterative improvement in future deployments of this framework include:

• Expansion of the analytical model to incorporate governance variables, leadership orientation, and multi-stakeholder dynamics.
• Site-specific sample collection to enable multi-group comparison across the five destination scenarios.
• Longitudinal replication to capture off-peak operational conditions and seasonal variation in structural relationships.
• Adaptation of the instrument for managerial operationalisation, enabling triangulation of findings across stakeholder perspectives.

CONCLUSION AND NEXT STEPS

The demonstration establishes that maintenance practices, safety measures, and sustainability initiatives are structurally interdependent components of tourism destination management in the Kwahu Plateau, and that integrated operational investment across these three domains produces demonstrably superior sustainability outcomes relative to siloed approaches. The key takeaway for destination managers is that neither maintenance nor safety investment alone is sufficient to optimise sustainability performance; simultaneous and proportionate development of both operational systems is required.Concrete follow-up actions for destination practitioners and policymakers emerging from this demonstration include:

• Immediate: Conduct operational audits of maintenance and safety systems at all five Kwahu destinations to establish current performance tertile positions and identify priority investment areas.

• Short-term: Develop integrated destination management plans incorporating maintenance and safety performance thresholds as preconditions for sustainability programme eligibility.
• Medium-term: Establish a longitudinal monitoring system tracking maintenance, safety, and sustainability indicators across peak and off-peak seasons.
• Research partnership: Engage the Ghana Tourism Authority and Eastern Region District Assemblies in a collaborative research programme to expand the framework to additional Ghanaian seasonal destinations.

RESULTS AND DISCUSSIONS

Descriptive Statistics

Descriptive statistics for the three primary constructs are presented in Table 2. Maintenance practices, safety measures, and sustainability initiatives recorded mean scores in the 3.35–3.41 range on the five-point scale, indicating perceptions of satisfactory but not strong operational performance across the five destination sites. The slightly elevated mean for sustainability practices relative to maintenance and safety may reflect the external visibility and reputational pressures associated with sustainability-oriented activities, which may be perceived as more salient by destination users even when underlying operational systems are only moderately functional. The relatively modest standard deviations indicate reasonable consensus among respondents, while the observed score ranges confirm sufficient variance for regression analysis.

Table 2: Descriptive Statistics

Variable	Obs	Mean	Std. Dev
Maintenance Practices	223	3.37	0.52
Safety Measures	223	3.35	0.61
Sustainability Practices	223	3.41	0.52

Reliability Analysis

Internal consistency reliability was assessed using Cronbach's alpha. As shown in Table 3, all three scales demonstrated acceptable to good internal consistency, supporting the use of scale composites in subsequent regression analyses.

Table 3: Reliability Results

Construct	**Items**	**Alpha (α)**	**Interpretation**
Maintenance Practices	14	.76	Acceptable reliability
Safety Measures	14	.86	Good reliability
Sustainability Initiatives	14	.82	Good internal consistency

Spearman Correlation Analysis

Table 4 presents Spearman correlation coefficients among the three study variables ($n = 223$). All pairwise correlations were statistically significant at $p < 0.001$. Maintenance practices were positively and moderately correlated with safety measures ($\rho = 0.433$, $p < 0.001$) and sustainability initiatives ($\rho = 0.429$, $p < 0.001$). The strongest bivariate relationship was between safety measures and sustainability initiatives ($\rho = 0.532$, $p < 0.001$), foreshadowing the mediation analysis findings.

Table 4: Spearman Correlation Matrix

	(1)	(2)	(3)
Variable	Maintenance practices	Safety measures	Sustainability initiatives
Maintenance practices	1	0.433^{***}	0.429^{***}

Safety measures	0.433***	1	0.532***
Sustainability initiatives	0.429***	0.532***	1

Note: *** $p < 0.001$ (two-tailed). N = 223

Simple Regression Analyses

Three simple linear regression models examined the individual predictive relationships among the constructs (Table 5). Model 1 revealed that maintenance practices significantly predicted safety measures ($\beta = 0.485$, SE = 0.071, $p < 0.001$), explaining 17.3% of variance ($R^2 = 0.173$). Model 2 demonstrated that maintenance practices significantly predicted sustainability initiatives ($\beta = 0.470$, SE = 0.060, $p < 0.001$), accounting for 22.0% of variance ($R^2 = 0.220$). Model 3 yielded the strongest individual-predictor relationship: safety measures significantly predicted sustainability practices ($\beta = 0.448$, SE = 0.049, $p < 0.001$), explaining 27.1% of variance ($R^2 = 0.271$). The progressive increase in explained variance from Model 1 through Model 3 is consistent with theoretical expectations that safety's closer operational proximity to sustainability generates a stronger predictive signal, and prefigures the partial mediation results

Table 5: Simple Regression Models

	(1)	(2)	(3)
	Safety Measures	Sustainability Initiatives	Sustainability Initiatives
Maintenance Practices	0.485***	0.470***	
	(0.071)	(0.060)	
Safety Measures			0.448***
			(0.049)
Constant	1.720***	1.826***	1.906***
	(0.243)	(0.203)	(0.168)
Observations	223	223	223
R^2	0.173	0.220	0.271

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Multiple Regression Analysis

A multiple regression model examined the combined effects of maintenance practices and safety measures on sustainability initiatives (Table 6). Both predictors contributed significantly and independently. Maintenance practices ($\beta = 0.305$, SE = 0.060, $p < 0.001$) and safety measures ($\beta = 0.339$, SE = 0.052, $p < 0.001$) each retained significant unique contributions when modelled simultaneously. Together, these predictors explained 34.8% of variance in sustainability outcomes ($R^2 = 0.348$, Adjusted $R^2 = 0.342$), representing a substantial increment over either predictor alone. The near-equivalent standardised coefficients indicate that neither maintenance nor safety dominates sustainability performance; both contribute uniquely and additively, lending empirical support to the integrated systems-theoretic framework advanced in this study.

Table 6: Multiple Regression

	(1)
Predictors	Sustainability Initiatives
Maintenance Practices	0.305***
	(0.060)
Safety Measures	0.339***
	(0.052)
Constant	1.243***
	(0.206)
Observations	223
R^2	0.348

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Mediation Analysis

Bootstrap mediation analysis (5,000 replications) tested whether safety measures mediated the relationship between maintenance practices and sustainability initiatives (Table 7). The indirect effect of maintenance practices on sustainability, operating through safety measures, was statistically significant ($\beta = 0.164$, BCa 95% CI [0.065, 0.158], $p < 0.001$). The direct effect of maintenance on sustainability remained significant after controlling for safety ($\beta = 0.305$, BCa 95% CI [0.178, 0.444], $p < 0.001$), confirming partial rather than full mediation. Safety measures accounted for approximately 35% of the total effect of maintenance on sustainability, indicating that while the safety pathway is an important operational mechanism, maintenance also contributes to sustainability through additional direct pathways, likely including material efficiency, lifecycle asset management, and waste reduction processes.

Table 7: Mediation Analysis Results

	(1)	(2)	(3)	(4)
	Sustainability Initiatives	Safety Measures	Sustainability Initiatives	Indirect effect
Maintenance Practices	0.470***	0.485***	0.305***	0.164***
	(0.060)	(0.071)	(0.060)	(0.004)
Safety Measures			0.339***	
			(0.052)	
Constant	1.826***	1.720***	1.243***	2.138***
	(0.203)	(0.243)	(0.206)	(0.050)
Observations	223	223	223	223
R^2	0.220	0.173	0.348	0.035

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

ANOVA Results

Three one-way ANOVAs were conducted to examine group-level differences across tertile-defined maintenance and safety performance levels. Safety measures differed significantly across maintenance practice tertiles ($F(2, 220) = 12.75$, $p < 0.001$, $\eta^2 = 0.104$; Table 8). Sustainability initiatives differed significantly across maintenance tertiles ($F(2, 220) = 19.68$, $p < 0.001$, $\eta^2 = 0.152$; Table 9) and across safety measure tertiles ($F(2, 220) = 35.16$, $p < 0.001$, $\eta^2 = 0.242$; Table 10), with all pairwise comparisons reaching significance (all $p \leq 0.002$). Tukey post-hoc tests confirmed significant differences between low and high, and medium and high, maintenance performance groups on both safety and sustainability outcomes. These group-level differences confirm the practical utility of the tertile benchmarking framework for destination managers seeking to identify performance improvement priorities.

Table 8: Safety Measures Across Maintenance Practice Levels

Group	N	Mean	SD	F	Df	p-value	Eta squared
Low	87	3.173	0.576	12.75	2, 220	<0.001	0.104
Medium	70	3.302	0.384				
High	66	3.643	0.733				
Total	223	3.353	0.609				

Table 9: Sustainability Initiatives Across Maintenance Levels

Group	N	Mean	SD	F	df	p-value	Eta squared
Low	87	3.205	0.527	19.68	2, 220	<0.001	0.152
Medium	70	3.387	0.421				
High	66	3.7	0.489				

Total	223	3.409	0.524				

Table 10: Sustainability Initiatives Across Safety Measure Levels

Group	N	Mean	SD	F	df	p-value	Eta squared
Low	85	3.111	0.519	35.16	2, 220	<0.001	0.242
Medium	69	3.455	0.353				
High	69	3.729	0.47				
Total	223	3.409	0.524				

DISCUSSION

The findings indicate that maintenance practices, safety measures, and sustainability initiatives should not be viewed as separate dimensions of tourism destination management. Instead, they seem to work as interconnected components of a broader operational system. Their effectiveness is dependent on the quality of interaction among its constituent elements. The observed interrelationships suggest that sustainability outcomes within seasonal tourism destinations emerge not only from dedicated environmental or social interventions but also derived from the condition of the operational structures that support visitor experiences and destination functionality.

A central contribution of the study is that operational processes frequently handled as administrative concerns have important implications for broader sustainability outcomes. In tourism policy and practice, sustainability is often discussed in relation to conservation programmes, environmental management, or community engagement initiatives. While these remain important, the present findings suggest that sustainability performance is also influenced by less visible operational functions, particularly infrastructure maintenance and safety management. This perspective broadens conventional understandings of destination sustainability by highlighting the importance of everyday operational reliability as a foundation for long-term tourism development.

Interdependency Between Maintenance and Safety

The significant positive association between maintenance practices and safety measures ($r = 0.416$; $\beta = 0.485$) underscores the importance of infrastructure quality in shaping risk conditions within tourism destinations. Well-maintained facilities contribute to safer visitor environments because they reduce the likelihood of structural deterioration, equipment malfunction environmental hazards, and service disruptions. Although this relationship may appear intuitive, its empirical significance is noteworthy because tourism research has often examined infrastructure quality and visitor safety as separate areas of inquiry.

The Kwahu context illustrates this relationship particularly well. Tourism activities associated with the Easter festivities combine large visitor concentrations with varying forms of recreation, including adventure tourism activities that involve elevated levels of physical risk (Boamah, 2014; Gyepi-Garbrah & Preko, 2022; Aninakwah, 2022; Ntow-Gyan, et al. 2026). Under such circumstances visitor protection becomes closely linked to infrastructure readiness. The condition of recreational facilities, access routes, viewing platforms, activity-specific equipment and public amenities can directly influence the ability of destination managers to maintain safe operating environments during periods of peak demand.

At the same time, the findings indicate that maintenance alone does not fully explain safety performance. The proportion of variance (17.3%) explained by maintenance suggests that additional organisational and institutional factors also contribute to safety outcomes. Staff competence, emergency preparedness, regulatory compliance, communication systems, and safety culture are likely to influence visitor protection independently of infrastructure condition (Neal & Griffin, 2006; Christian et al., 2009). This observation is important because it warns against reducing safety management to a purely technical exercise. Effective destination safety requires both institutional capacity and physical reliability.

Maintenance can therefore be understood as a necessary but insufficient condition for safety performance when viewed through a systems perspective (von Bertalanffy, 1950; Checkland, 1994; Jackson, 2016). Infrastructure quality establishes the conditions under which safety systems operate, but the effectiveness of those systems ultimately depends on the integration of physical, managerial, and organisational resources.

Maintenance as a Foundation for Sustainability

The positive association between maintenance practices and sustainability initiatives ($r = 0.469$; $\beta = 0.470$) suggests that the long-term viability of tourism destinations is influenced by more than strategic sustainability commitments alone.

Infrastructure maintenance appears to play a supporting role in creating conditions that enable sustainability objectives to be realised.

This relationship may operate through several interconnected pathways. At a practical level, routine maintenance extends the lifespan of tourism assets, reduces the frequency of replacement cycles, and minimises unnecessary resource consumption (Geissdoerfer et al., 2017; Ibe et al., 2025). Such outcomes align closely with contemporary sustainability principles that emphasise efficiency, waste reduction, and responsible resource use. Well-maintained facilities also tend to remain functional for longer periods, reducing financial pressures associated with emergency repairs and infrastructure replacement.

Beyond these material considerations, maintenance may reflect broader organisational characteristics that support sustainable management (Eccles et al., 2014; Hahn et al., 2015). Tourism destinations capable of implementing systematic maintenance programmes are often characterized by more effective resource allocation, stronger planning processes, and greater institutional commitment to long-term operational goals. These organisational qualities are similarly important for the successful implementation of sustainability initiatives.

The findings therefore imply that sustainability should not be framed solely as an environmental outcome, rather, it may be more accurately understood as a product of organisational practices that support the long-term functioning of destination systems (Eccles et al., 2014; Hahn et al., 2015). Maintenance contributes to sustainability simply because it preserves infrastructure, and reflects a broader orientation towards continuity, stewardship, and future planning.

Safety as a Driver of Sustainability Outcomes

Among the relationships examined in this study, the association between safety measures and sustainability initiatives was the strongest ($r = 0.521$; $\beta = 0.448$). This finding explains an aspect of destination sustainability that has had comparatively little empirical attention within tourism research.

Safety is often treated as a requirement for tourism development since visitors are not likely to engage with destinations perceived as not safe. The present findings suggest a more expansive role, rather than functioning merely as a condition for tourism participation. Safety appears to contribute directly to broader sustainability outcomes.

One explanation can be found in the role of trust within destination systems. Confidence among local communities, visitors, regulatory agencies and investors is strengthened when safety is managed effectively. Such confidence can encourage repeat visitation, enhance destination reputation, and support longer-term tourism development objectives viability (Hsieh & Kung, 2020; Aureli et al., 2023). Safety therefore contributes to immediate visitor welfare and to the social and institutional stability upon which sustainable tourism depends.

This dynamic is particularly relevant in destinations such as Kwahu, where high-profile events and adventure tourism activities attract substantial public attention (Boamah, 2014; Gyepi-Garbrah & Preko, 2022; Aninakwah, 2022; Ntow-Gyan, et al. 2026). Safety incidents occurring in such environments can have consequences that go well beyond individual visitors, affecting future tourism demand, destination image, and stakeholder confidence (Gössling et al., 2012; Font et al., 2016; Espiner et al., 2023). Investments in safety management may therefore create benefits that extend across economic, environmental, and social dimensions of sustainability.

The findings question the tendency to place sustainability and safety within separate management agendas. In practice, they appear closely interconnected as safety initiatives can strengthen sustainability outcomes by preserving stakeholder trust, supporting destination resilience, and enhancing the long-term viability of tourism operations.

Sustainability as an Emergent Outcome of Operational Systems

The combined influence of maintenance and safety on sustainability performance is the strongest theoretical insight emerging from this study. These factors explained substantially more variation in sustainability outcomes than either variable alone when considered together. This result means that the interaction of operational systems influences sustainability rather than being shaped by isolated management activities.

This finding is in line with systems-theoretical perspectives that view organisational outcomes as products of interconnected processes (von Bertalanffy, 1950; Checkland, 1994; Jackson, 2016). Tourism destinations are made up of many subsystems such as management structures, infrastructure networks, visitor services, environmental resources, and governance arrangements. Improvements in one area can influence outcomes elsewhere. While weaknesses within one subsystem may undermine the performance of the wider destination system.

The results indicate that maintenance and safety operate as complementary rather than competing priorities. Investments directed exclusively towards one part may therefore yield limited benefits if corresponding weaknesses persist elsewhere. However, coordinated improvements across both domains appear more likely to support stronger sustainability outcomes.

This observation has practical meanings for destination governance. Management approaches that allocate responsibilities for maintenance, safety, and sustainability to separate administrative units may unknowingly overlook important interconnections among these functions. The capacity of destinations to achieve long-term sustainability objectives may be enhanced through greater integration of planning, budgeting, monitoring, and operational decision-making

Understanding the Mediating Role of Safety

The mediation analysis provides additional insight into how operational interdependencies influence sustainability outcomes. The results indicate that part of the influence of maintenance on sustainability occurs through its contribution to safety performance. In other words, maintenance appears to improve sustainability partly because it enhances the conditions under which safer tourism experiences can be provided.

These findings enhance understanding beyond simple correlation by showing a plausible mechanism connecting infrastructure management to sustainability outcomes. Some literatures have generally acknowledged relationships among the three constructs without indicating how these relationships work in practice. This finding suggests that safety is one conduit through which maintenance creates broader destination benefits.

Importantly, maintenance retained a significant direct effect on sustainability even after accounting for safety. This indicates that additional mechanisms are also likely to be involved. Environmental performance, resource efficiency, organisational effectiveness and lifecycle asset management may represent many other pathways through which maintenance influence sustainability outcomes.

CONCLUSION

This study assessed the relationships among maintenance practices, safety measures, and sustainability initiatives within the Kwahu area of Ghana. The analysis was motivated by the observation that these concepts are frequently treated as separate areas of practice and research despite their obvious operational associations.

The findings show that maintenance, safety, and sustainability are connected through a network of reinforcing relationships. There was positive association among maintenance practices, safety measures and sustainability initiatives. Safety emerged as the strongest predictor of sustainability performance. The mediation analysis further revealed that part of the contribution of maintenance to sustainability operates through improvements in safety conditions. This highlights an important pathway through which operational investments may generate broader destination benefits.

These results contribute to tourism management scholarships in several ways. First, the study contributes evidence from a Sub-Saharan African tourism context, a region that remains comparatively underrepresented within empirical research on operational dimensions of destination. Second, they extend existing discussions of destination management by illustrating how infrastructure maintenance and visitor safety interact to shape longer-term sustainability performance. Third, they provide empirical evidence supporting the view that routine operational processes and dedicated sustainability programmes influence sustainability outcomes.

From a theoretical standpoint, the findings give support to system-oriented perspectives of destination management. Rather than viewing maintenance, safety, and sustainability as discrete constructs, the results suggest that destination performance emerges through interactions among multiple operational subsystems. This perspective questions the separate management approaches. It also highlights the importance of examining tourism destinations as interconnected socio-technical systems.

The study also has practical relevance for destinations characterised by seasonal fluctuations in visitor demand. In contexts, safety deficiencies, infrastructure deterioration and sustainability challenges may reinforce one another, particularly during periods of peak tourism activity. The evidence shows that investments directed towards infrastructure maintenance and safety management may create benefits that go beyond immediate operational performance by supporting broader sustainability outcomes.

Several limitations should be acknowledged. The cross-sectional design limits the ability to establish causal relationships conclusively. The extent to which findings can be generalised across different seasons is restricted because of the concentration of data collected during peak tourism periods with high visitors turn out. In addition, the study focused primarily on visitor perceptions and did not explicitly incorporate governance variables (institutional capacity, leadership structures, stakeholder coordination, or regulatory effectiveness). These factors may influence the relationships observed and require further investigation.

Future research could resolve these limitations through longitudinal designs that deal with seasonal variation in destination conditions. The consistency of the relationships identified in the present study could be evaluated through

comparative studies across different tourism destinations. Additional work involving community participation, governance, and organisational capacity variables may depeen understanding of the mechanisms through which operational systems influence sustainability outcomes.

To sum up, the study suggests that sustainability in seasonal tourism destinations appears to depend substantially on the effectiveness of the operational systems that support destination functioning. Recognising the interconnected nature of maintenance, safety, and sustainability may therefore contribute to more integrated and stronger approaches to destination management.

RECOMMENDATIONS

The findings indicate that destination sustainability is influenced by operational processes that are often managed separately in practice. Accordingly, we propose a need for greater integration between maintenance planning, safety management, and sustainability strategies within seasonal tourism destinations.

Recommendations for Destination Managers

A more coordinated approach to operational planning should be adopted by destination managers, recognising maintenance and safety as integral components of sustainability performance instead of an independent administrative function. Decisions on allocation of resources should therefore consider the potential indirect sustainability benefits associated with investments in infrastructure maintainence and visitor protection measures.

Preventive maintenance programmes should be made a priority over reactive maintenance approaches where possible. Asset monitoring systems, routine inspection schedules, and timely repair interventions can help reduce infrastructure defects during peak tourism periods. Thereby reducing safety risks and improving overall destination performance. Off-peak periods provide valuable opportunities for maintenance work that may be difficult to undertake during periods of high visitor demand due to the seasonal nature of tourism activity within the Kwahu area,

The findings also suggest the importance of strengthening institutional aspects of safety management. Investments in staff training, emergency preparedness, risk communication, and incident response systems may contribute not only to visitor protection but also to broader sustainability objectives through enhanced destination credibility and stakeholder confidence.

Managers should further establish monitoring systems capable of tracking maintenance conditions, safety performance, and sustainability indicators simultaneously. Such integrated monitoring approaches would facilitate evidence-based decision-making and enable the identification of operational weaknesses before they develop into more significant management challenges.

Recommendations for Tourism Policymakers

Tourism policymakers should consider incorporating operational indicators into destination sustainability assessment frameworks. Existing sustainability policies frequently emphasise environmental and socio-economic outcomes while giving less attention to the operational conditions that support those outcomes. Integrating maintenance and safety indicators into policy evaluation systems may provide a more comprehensive understanding of destination performance.

Government agencies responsible for tourism development should also encourage greater collaboration among local authorities, destination managers, emergency services, and tourism operators. Effective coordination among these stakeholders is particularly important in destinations experiencing substantial seasonal fluctuations in visitor numbers, where operational pressures can intensify rapidly during peak periods.

The findings additionally highlight the importance of infrastructure investment as a component of sustainable tourism development. Policymakers should therefore view maintenance expenditure not solely as a cost associated with asset preservation but also as an investment in destination resilience and long-term sustainability.

Recommendations for Future Research

Future studies should examine the relationships identified in this research across different tourism contexts, including urban destinations, protected areas, coastal resorts, and community-based tourism settings. Such comparisons would help determine the extent to which the observed relationships are context-specific or broadly applicable across tourism systems.

Longitudinal research designs would be particularly valuable for investigating how maintenance, safety, and sustainability interact over time. Seasonal tourism destinations offer an especially useful setting for such investigations because operational pressures often vary considerably throughout the year.

Additional research should also explore the influence of governance and institutional factors on destination performance. Variables such as leadership effectiveness, stakeholder collaboration, regulatory enforcement, and community

participation may play important roles in shaping the relationships among maintenance, safety, and sustainability and therefore represent promising directions for future inquiry.

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Disclosure statement
The authors report no potential conflicts of interest

Data availability statement
The data that support the findings of this study are openly available in Mendeley Data at
https://data.mendeley.com/preview/xw4vgw957m?a=9d69f4d0-a4a2-454a-8fbc-93e0f7ad1ee7

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