

Article

Evaluating tourism destination sustainability through Saviki's approach for effective sustainable tourism development

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Abstract

Sustainable management of cultural heritage destinations requires balancing resource conservation, community welfare, and visitor experiences. This study evaluates tourism sustainability at Gedong Songo Temple, Indonesia, through an integrated assessment of relationships among resources, local communities, and tourism. A case study approach combined observation, interviews with residents, tourists, and resource managers, and questionnaire responses. The Delphi technique was used to identify evaluation indicators and their relative priorities across environmental, social, and economic dimensions. The assessment revealed uneven performance across stakeholder relationships. Resource interpretation and opportunities for cultural interaction emerged as relative strengths, whereas tourism contributions to conservation and community benefits required greater attention. These findings suggest that satisfactory visitor experiences do not necessarily coincide with equitable economic benefits or sufficient support for resource protection. Management should strengthen community participation, improve the distribution of tourism benefits, and connect tourism revenue with conservation activities. The indicator framework offers a basis for identifying management priorities and monitoring destination sustainability. However, stakeholder perceptions provide context-dependent evidence rather than objective confirmation of environmental or economic outcomes. Future research should validate the indicators using broader stakeholder participation, transparent weighting procedures, and complementary measures of conservation performance and community welfare before adapting the framework to other heritage destinations.

Introduction

Sustainable tourism development requires destinations to balance visitor experiences, resource conservation, and community welfare. This challenge is especially relevant to cultural heritage destinations in natural landscapes, where tourism depends on both environmental quality and the preservation of historical assets. Tourism can support local livelihoods and generate resources for conservation, but its expansion may also place pressure on ecosystems, public facilities, and community life. Evaluating sustainability therefore requires attention to how tourism benefits and pressures are distributed among the groups responsible for, affected by, and participating in destination development.

Gedong Songo Temple in Semarang Regency, Central Java, Indonesia, provides a relevant setting for examining these relationships. The destination combines cultural heritage, a mountainous landscape, and recreational activities, creating opportunities for tourism that connects cultural appreciation with nature-based experiences. Its sustainability depends on maintaining these resources while accommodating visitors and supporting surrounding communities. Previous studies have examined ecotourism development and sustainable tourism facilities at Gedong Songo, establishing a basis for further investigation of destination [management](#) (Sulistiyadi, 2014; Rahmat et al., 2020). Environmental education has also received attention as a means of supporting conservation in the area (Cahyaningrum et al., 2021). These strands of research highlight the relevance of assessing how conservation, tourism activities, and community interests are connected.

Ecotourism provides a framework for understanding these connections. Ceballos-Lascuráin (1996) associates ecotourism with responsible visitation, conservation, limited environmental disturbance, and beneficial local involvement. These principles indicate that a destination's natural setting alone does not establish its sustainability. Its management must also support environmental protection, educational experiences, and meaningful community participation. At a cultural heritage

destination, these objectives extend to safeguarding historical resources and ensuring that tourism activities remain compatible with their preservation.

The relationships among resources, communities, and tourism are central to this evaluation. [Ross and Wall \(1999a, 1999b\)](#) examine ecotourism through the connections between resource protection, local people, and visitor activities. Their perspective suggests that tourism sustainability depends on reciprocal contributions: resources support tourism experiences and community livelihoods, communities participate in resource stewardship and tourism services, and tourism can provide benefits that support both conservation and local welfare. However, these contributions need not develop equally. A destination may deliver attractive visitor experiences while providing limited community benefits or insufficient support for conservation.

Stakeholder participation is therefore essential to understanding destination sustainability. [Wallace and Pierce \(1996\)](#) incorporate conservation and local involvement into their evaluation of ecotourism, while [Ryan \(2002\)](#) discusses equity, management, and power sharing in sustainable tourism. Together, these perspectives highlight the importance of examining who participates in destination decisions, who receives tourism benefits, and who bears its costs. Community involvement should consequently be assessed beyond the existence of tourism-related employment, including opportunities to influence development priorities and participate in resource management.

Sustainability also requires an integrated interpretation of environmental, social, and economic conditions. [McCool \(1995\)](#) discusses the connections between tourism, the environment, and sustainability, providing a foundation for considering these dimensions together. Tourism-related benefits in one dimension may coexist with pressures in another. Increased visitor spending, for example, may support local economic activity without ensuring adequate resource protection or equitable participation. An evaluation framework must therefore identify differences between dimensions rather than reduce sustainability to visitor numbers or economic revenue alone.

Indicators provide a practical means of organising such an assessment. [Selman \(1999\)](#) discusses their relevance to monitoring sustainable development, while [Briassoulis \(2001\)](#) examines the conceptual challenges involved in selecting and interpreting sustainability indicators. Indicators translate broad objectives into aspects that can be assessed, compared, and monitored. Nevertheless, their usefulness depends on whether they represent the destination's management concerns and whether their measurement procedures are transparent. An extensive indicator list does not automatically produce an informative evaluation if the indicators lack contextual relevance or a clear connection to decision-making.

Stakeholder perceptions can contribute to indicator development by identifying concerns that administrative or physical measures may overlook. [Ap and Crompton \(1998\)](#) examine perceived tourism impacts across economic, social, and environmental domains, supporting the use of structured assessments of stakeholder experiences. Residents may emphasise livelihood opportunities and changes in community life, tourists may focus on interpretation and recreational quality, and resource managers may prioritise conservation responsibilities. These perspectives can provide complementary evidence, although perceptions should be distinguished from direct measurements of environmental condition, income distribution, or conservation expenditure.

The contextual nature of sustainability further reinforces the importance of locally grounded indicators. [Twining-Ward and Butler \(2002\)](#) demonstrate the relevance of developing and applying tourism sustainability indicators within a specific destination setting. Indicators appropriate to one location may require adjustment elsewhere because resource characteristics, community priorities, and management arrangements differ. [Li \(2004\)](#) similarly provides a destination-specific approach to environmental management indicators for ecotourism. These contributions suggest that transferable evaluation frameworks should retain flexibility while maintaining consistent definitions and measurement procedures.

The Delphi technique offers one approach to refining indicators through structured consultation. [Miller \(2001\)](#) applies Delphi procedures to the development of sustainable tourism indicators, illustrating their role in organising judgements about relevant assessment criteria. [Green et al. \(1990\)](#) also examine the technique in tourism-related environmental assessment. Its value lies in making the selection process systematic, but the credibility of the resulting framework depends on clearly documenting participant selection, consultation rounds, consensus criteria, and weighting procedures. Stakeholder consultation and Delphi-based indicator refinement should therefore be reported as distinct but connected stages of the evaluation.

For Gedong Songo, an assessment of reciprocal stakeholder relationships can complement existing research on ecotourism development, facilities, and environmental education. Rather than assuming that satisfactory tourism experiences indicate overall sustainability, this approach examines whether resource conservation, community participation, and tourism benefits are mutually supportive. Its contribution is primarily contextual and methodological: applying an integrated relationship-based framework to identify management priorities within a cultural heritage

destination. The framework does not by itself establish causal relationships or objectively confirm sustainable performance, but it can reveal areas requiring more detailed investigation.

Accordingly, this study evaluates tourism sustainability at Gedong Songo Temple by examining six directional relationships among resources, communities, and tourism. It draws on observation, interviews, and questionnaire responses, with Delphi-based procedures used to refine evaluation indicators and their priorities. The objectives are to assess perceived strengths and weaknesses across environmental, social, and economic dimensions and identify opportunities to improve the balance between visitor experiences, community welfare, and conservation. The findings are intended to support destination management and provide a foundation for subsequent validation using complementary indicators of resource condition and local economic outcomes.

Literature Review

Sustainable Tourism and Destination Management. Sustainable tourism concerns the long-term relationship between tourism activities, environmental integrity, community welfare, and the economic viability of destinations. Its evaluation requires attention to the conditions under which tourism operates rather than assuming that increasing visitor numbers or revenue indicates sustainable development. [Saarinen \(2006\)](#) distinguishes resource-based, activity-based, and community-based traditions of sustainability, showing that different perspectives emphasise different development limits and priorities. For cultural heritage destinations, these perspectives connect the protection of historical and natural resources with visitor management and local participation.

[Buckley \(2012\)](#) identifies a persistent gap between sustainability research and tourism practice. This distinction indicates why sustainability claims require evidence concerning actual management processes and outcomes. A destination can provide enjoyable experiences while continuing to face environmental pressures or unequal distributions of benefits. Consequently, visitor satisfaction should form one component of evaluation rather than serve as a substitute for conservation and community welfare indicators.

Governance provides the institutional connection between these objectives and their implementation. [Bramwell and Lane \(2011\)](#) examine the governance of tourism and sustainability, highlighting the importance of decision-making arrangements and the wider context in which management occurs. At destination level, sustainability therefore depends on both available resources and the capacity to coordinate their protection and use.

The Global Sustainable Tourism Council's destination criteria organise assessment around sustainable management, socioeconomic sustainability, cultural sustainability, and environmental sustainability ([GSTC, 2019](#)). These categories provide a useful reference for ensuring that heritage protection and community interests receive attention alongside environmental management. They offer a benchmark for indicator coverage; their use as a conceptual reference does not establish that a destination has achieved certification or compliance.

Stakeholder Theory and Destination Relationships. Stakeholder theory provides a foundation for examining the groups involved in destination sustainability. [Freeman \(1984\)](#) directs managerial attention towards parties that affect or are affected by organisational activities. Applied to tourism, this perspective supports consideration of residents, visitors, resource managers, businesses, and public authorities whose interests are connected through destination development.

[Donaldson and Preston \(1995\)](#) distinguish descriptive, instrumental, and normative dimensions of stakeholder theory. The descriptive dimension concerns how stakeholder relationships operate; the instrumental dimension considers their connection to organisational objectives; and the normative dimension recognises the legitimacy of stakeholder interests. In destination evaluation, this distinction supports examining both management performance and whether affected groups have meaningful opportunities to express their concerns.

[Waligo et al. \(2013\)](#) translate stakeholder involvement into a framework for implementing sustainable tourism. Their work highlights the importance of leadership, stakeholder relationships, and implementation capacity. Consultation is therefore more useful when it informs decisions and continuing management than when it is limited to collecting opinions. For Gedong Songo, stakeholder evidence can identify differences in priorities, but responding to those differences requires coordination among responsible actors.

Community Participation and Empowerment. Community participation is relevant because residents experience tourism's benefits and pressures while also contributing labour, knowledge, services, and cultural practices. [Scheyvens \(1999\)](#) evaluates ecotourism through economic, psychological, social, and political empowerment. This framework broadens community assessment beyond income generation to include confidence, collective organisation, and influence over

decisions. A destination may create employment without providing residents with meaningful control over development.

Participation nevertheless operates within institutional and social constraints. [Tosun \(2000\)](#) identifies limitations to community participation in tourism development in developing countries. These constraints caution against interpreting the absence of participation simply as a lack of community interest. Limited information, administrative arrangements, and unequal access to decision-making may restrict involvement even when residents wish to contribute.

[Reed \(2008\)](#) similarly emphasises the quality and design of stakeholder participation in environmental management. Participation can combine local knowledge with other forms of expertise, but its usefulness depends on how participants are identified and how their contributions enter the decision process. For heritage destinations, indicators should consequently distinguish attendance at consultation activities from substantive opportunities to shape conservation and tourism priorities.

Sustainability Indicators and Contextual Evaluation. Sustainability indicators translate broad objectives into aspects that can be assessed and monitored. [The World Tourism Organization \(2004\)](#) provides guidance on destination-specific indicators and their application to tourism planning and management. Relevant indicators should address identifiable concerns, have interpretable meanings, and connect findings to management action. Their selection should also reflect the availability and quality of evidence.

[Choi and Sirakaya \(2006\)](#) develop sustainability indicators for community tourism using a multidimensional framework. Their approach supports the inclusion of governance and contextual considerations alongside economic, social, and environmental conditions. For Gedong Songo, this suggests that evaluation should cover the processes through which conservation and community benefits are pursued, as well as perceptions of their outcomes.

Perception-based indicators can reveal experiences that administrative records overlook, including satisfaction with participation, cultural interaction, interpretation, and management responsiveness. However, favourable perceptions do not directly establish ecological stability, equitable income distribution, or adequate conservation expenditure. Perceptual evidence should therefore be interpreted according to what respondents can reasonably observe and, where possible, complemented by physical, financial, or administrative measures.

Weighting and aggregation require similar care. A composite score can summarise several indicators, but it may conceal weak performance in particular relationships. Its interpretation depends on transparent definitions, consistent scoring directions, justified weights, and clear treatment of missing values. Dimension-level results should remain visible so that satisfactory performance in one area does not obscure unresolved problems elsewhere.

The Delphi Technique in Indicator Development. The Delphi technique provides a structured process for eliciting and refining informed judgements. [Landeta \(2006\)](#) discusses its continuing relevance to social science research, including situations in which available evidence is incomplete and expert assessment contributes to decision-making. It is particularly useful for considering which indicators are relevant and how priorities should be established.

[Okoli and Pawlowski \(2004\)](#) emphasise design considerations including expert selection and the organisation of consultation. A credible Delphi application should identify the expertise required, explain panel recruitment, and document how responses are synthesised across rounds. Stakeholder interviews can inform indicator development, but interviews alone should not be described as a Delphi process without the associated procedures.

[Hsu and Sandford \(2007\)](#) explain the role of repeated consultation and controlled feedback in developing consensus. Participants reconsider judgements in light of anonymised group information, reducing reliance on a single response. Consensus criteria and stopping rules should be specified transparently, and persistent disagreement should be reported rather than removed solely to produce uniformity. Agreement supports indicator selection; it does not independently validate the indicators against environmental or socioeconomic outcomes.

Integrated Relationships among Resources, Communities, and Tourism. The relationship-based framework of [Tsaour et al. \(2006\)](#) is particularly relevant to the present study because it evaluates ecotourism sustainability through connections among resources, communities, and tourism. It provides an explicit conceptual source for examining six directional relationships, extending the reciprocal perspective associated with [Ross and Wall \(1999a, 1999b\)](#). The study's framework should therefore be described as an adaptation of this established approach.

Directional relationship	Evaluation focus at Gedong Songo
Resources → Community	Contributions of resource management to environmental quality, education, livelihoods, and community welfare
Community → Resources	Resident participation in conservation, planning, stewardship, and responsible resource use
Resources → Tourism	Heritage interpretation, environmental education, attraction quality, and visitor experiences
Tourism → Resources	Visitor pressures, conservation contributions, and responsible behaviour
Community → Tourism	Local hospitality, cultural experiences, interpretation, and resident–visitor interaction
Tourism → Community	Employment, distribution of benefits, cultural consequences, and pressures on everyday community life

The distinction between directions prevents reciprocal relationships from being treated as equivalent. Resources may generate attractive tourism experiences while tourism provides limited support for their protection. Similarly, communities may contribute to visitor experiences without receiving proportionate benefits. Separate assessment of each direction allows these imbalances to remain visible.

Drawing on stakeholder theory, community empowerment, sustainability indicators, and Delphi methodology, the present study uses this framework to organise perceptions and identify management priorities. Its contribution lies in contextual application to Gedong Songo, while subsequent validation should examine whether perceived performance corresponds with conservation conditions and community outcomes. The framework serves as an evaluation structure rather than a causal model, so the relationships are assessed through indicators rather than formulated as causal hypotheses.

Methods

Research Design and Study Setting. This study employed a descriptive case study design to evaluate perceived tourism sustainability at Gedong Songo Temple, Semarang Regency, Central Java, Indonesia. The assessment combined field observation, stakeholder interviews, and a structured questionnaire. It examined environmental, social, and economic concerns through six directional relationships among resources, communities, and tourism. The evaluation framework was adapted from Tsauro et al. (2006), drawing on the resource–community–tourism perspective of Ross and Wall (1999a, 1999b).

Participants and Data Collection. The questionnaire dataset contained 25 usable responses, comprising 17 visitors and eight respondents associated with destination management, ticketing, security, or resource administration. Participants were selected based on their involvement in destination activities and their ability to assess the relevant conditions. Interviews with local residents, visitors, and resource managers provided contextual information, while observation examined facilities, visitor activities, resource conditions, and interactions at the destination. The findings represent the participating stakeholders' assessments rather than a statistically representative estimate of all destination users or surrounding residents.

Evaluation Instrument. The questionnaire comprised 44 items distributed across six relationship dimensions: resources to community (eight items), community to resources (eight items), resources to tourism (11 items), tourism to resources (four items), community to tourism (four items), and tourism to community (nine items). These dimensions addressed conservation, participation, interpretation, visitor experiences, cultural interaction, economic benefits, and tourism-related pressures.

Responses were recorded using a five-point Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The instrument included both positive statements and statements describing adverse impacts. Accordingly, the interpretation of individual responses depended on item wording: agreement with a positive statement indicated favourable performance, whereas agreement with an adverse-impact statement indicated a sustainability concern.

Indicator Framework and Weighting. The assessment used an established indicator framework informed by Delphi-based indicator development. Delphi procedures provide a structured means of refining informed judgements, but their credibility depends on transparent panel selection, repeated consultation, feedback, and consensus criteria (Miller, 2001; Okoli & Pawlowski, 2004; Hsu & Sandford, 2007). The present study applied the relationship structure and weighting information reported in the adapted framework. Stakeholder questionnaires assessed perceived destination performance; these responses were analytically distinct from expert judgements used to establish indicator priorities.

Data Analysis. Questionnaire responses were analysed descriptively to summarise item-level assessments and compare performance across the six relationship dimensions. Observation and interview information were used to contextualise reported strengths and concerns. The evaluation also considered weighted scores to summarise the relative contribution of each relationship to the overall assessment.

Consistent scoring direction is necessary when aggregating positive and adverse-impact statements. For a five-point scale, reverse coding of an adverse-impact item is expressed as ($r^* = 6 - r$), so that higher adjusted scores consistently indicate more favourable performance. Composite interpretation therefore requires verification of item coding, indicator weights, and the normalisation procedure before assigning an overall sustainability category. The results were interpreted as evidence of perceived performance and management priorities. They were not treated as causal estimates or direct confirmation of ecological conditions, conservation effectiveness, or the distribution of economic benefits.

Result and Discussion

The results describe questionnaire participation and stakeholder assessments of six relationships among resources, communities, and tourism at Gedong Songo Temple. The analysis begins with questionnaire returns, followed by descriptive scores, relationship weights, and an assessment of the reported composite results.

Questionnaire Participation. The manuscript reports usable questionnaires from visitors and two groups associated with destination management and resource administration. Table 1 summarises the number of questionnaires distributed and the usable responses obtained.

Table 1. Questionnaire Returns by Reported Participant Group

Reported participant group	Questionnaires distributed	Usable responses	Return rate (%)
Destination management, ticketing, and security personnel	5	3	60.00
Resource administration personnel	8	5	62.50
Visitors	20	17	85.00
Total	33	25	75.76

Source: Questionnaire administration figures reported in the manuscript.

A total of 25 usable questionnaires were obtained, representing a return rate of 75.76%. Visitors contributed 17 responses, or 68.00% of the dataset, while the remaining eight responses came from the two operational groups. The questionnaire findings therefore predominantly reflect visitor participation. Although interviews with residents are mentioned, the reported participant descriptions do not identify a separate resident questionnaire group. Following the participation summary, responses were examined across the six relationship dimensions to describe the aspects evaluated by participants.

Descriptive Assessment of Stakeholder Relationships. An average score was calculated for each respondent across the items belonging to each relationship dimension. Table 2 presents the means and sample standard deviations of these respondent-level averages.

Table 2. Descriptive Questionnaire Scores across Six Relationship Dimensions

Relationship dimension	Number of items	Mean	Standard deviation
Contributions of resources to community welfare	8	3.795	0.455
Community involvement in resource management	8	3.515	0.396
Contributions of resources to tourism experiences	11	4.025	0.431
Tourism contributions and pressures on resources	4	3.710	0.393
Community contributions to tourism experiences	4	3.970	0.447
Tourism benefits and pressures on communities	9	3.338	0.396

Source: Calculations from the 25 respondent records supplied in the manuscript.

The contribution of resources to tourism experiences recorded the highest mean, followed by community contributions to tourism experiences. Tourism benefits and pressures on communities recorded the lowest mean. Standard deviations ranged from 0.393 to 0.455, indicating broadly similar variation in responses across the dimensions.

These means summarise agreement with the questionnaire statements. Several dimensions contain both favourable statements and statements describing adverse impacts. Agreement with favourable statements indicates positive conditions, whereas agreement with adverse-impact statements indicates concerns. The scores therefore require consistent item coding before they can be interpreted as comparative measures of sustainability. The following subsections explain the content underlying these assessments.

Contributions of Resources to Community Welfare. This dimension recorded a mean of 3.795 and a standard deviation of 0.455. Its items addressed educational opportunities, environmental awareness, interaction with resource administration, economic benefits, conservation, and environmental quality. The questionnaire also included a statement concerning disruption to residents' everyday lives.

The responses provide information about perceived connections between destination resources and community conditions. However, the combined score incorporates statements with different directions. It cannot independently establish the extent of community benefit without confirming how the disruption item was treated in the calculation. The assessment next considered the community's involvement in protecting and managing destination resources.

Community Involvement in Resource Management. Community involvement in resource management recorded a mean of 3.515 and a standard deviation of 0.396. The items concerned conservation support, participation in planning and management, interpretation services, pollution prevention, and ecosystem protection. Other statements addressed resource disturbance, exploitation, and development pressures.

The dimension captures both participation and potential pressures associated with community activities. These aspects require separate interpretation because agreement with conservation statements and agreement with resource-disturbance statements have different implications. The aggregate mean consequently remains a descriptive response score pending verification of item coding. Following these community-related assessments, the analysis examined the contribution of destination resources to visitor experiences.

Contributions of Resources to Tourism Experiences. The contribution of resources to tourism experiences recorded a mean of 4.025 and a standard deviation of 0.431. Its 11 items primarily addressed educational opportunities, interpretation facilities and services, environmental awareness, recreation, appreciation, and visitor attraction.

The comparatively high mean indicates generally favourable agreement with the destination's contribution to visitor learning and recreational experiences. This finding identifies resource interpretation and attraction quality as positively assessed aspects of the questionnaire. It does not, however, directly establish the condition of heritage assets or the effectiveness of conservation management. The reciprocal assessment considered how tourism activities contributed to, or placed pressure on, those resources.

Tourism Contributions and Pressures on Resources. This dimension recorded a mean of 3.710 and a standard deviation of 0.393. The items addressed ticket purchases supporting conservation and security, visitor cleanliness, economic contributions, and damage to environmental quality. The responses reflect several ways in which tourism may interact with resource management. However, the environmental-damage statement describes an adverse condition, while the remaining statements describe favourable contributions. Its coding must therefore be verified before the combined score can be interpreted as evidence of conservation performance. The analysis subsequently examined the community's contribution to the tourism experience.

Community Contributions to Tourism Experiences. Community contributions to tourism experiences recorded a mean of 3.970 and a standard deviation of 0.447. The four items concerned opportunities for local experiences, cultural variety, cultural exchange, and positive interaction between residents and visitors. Agreement with these favourable statements suggests that respondents generally recognised the community's contribution to the destination experience. The result highlights perceived opportunities for cultural interaction, although it does not indicate how tourism benefits were distributed among residents. To address that distinction, the final relationship dimension considered tourism-related benefits and pressures experienced by communities.

Tourism Benefits and Pressures on Communities. This dimension recorded a mean of 3.338 and a standard deviation of 0.396. Its nine items covered income distribution, local development, employment, welfare, and satisfactory tourism. It also included statements concerning congestion,

public safety, cultural loss, and environmental damage. The dimension combines potential benefits with adverse consequences. Its lower mean cannot automatically be interpreted as weaker sustainability because disagreement with adverse-impact statements may represent favourable conditions. Item-level assessment and consistent coding are necessary to distinguish perceived benefits from reported concerns. Beyond the descriptive scores, the manuscript supplied weights intended to represent the relative priority of each relationship in the evaluation framework.

Reported Relationship Weights. Table 3 presents the weights following the directional descriptions in the manuscript. Some labels in the original table were duplicated or reversed, so their correspondence requires confirmation against the indicator documentation.

Table 3. Reported Weights of the Relationship Dimensions

Relationship dimension	Reported weight (%)
Contributions of resources to community welfare	16.38
Community involvement in resource management	19.74
Contributions of resources to tourism experiences	12.66
Tourism contributions and pressures on resources	20.88
Community contributions to tourism experiences	12.74
Tourism benefits and pressures on communities	17.60
Total	100.00

Source: Weighting information and relationship descriptions supplied in the manuscript.

Tourism contributions and pressures on resources received the largest reported weight, followed by community involvement in resource management. Together, these dimensions accounted for 40.62% of the weighting framework, indicating substantial emphasis on resource-related relationships. These weights express assessment priorities rather than observed performance. Their application requires a consistent scoring procedure and verification of how indicator-level weights were combined. The final assessment therefore examined the consistency of the reported composite results.

Composite Sustainability Assessment. The manuscript reports an overall score of 72.03 in the narrative and 70.13 in the weighted-results table. Table 4 summarises these figures and the issues affecting their interpretation.

Table 4. Consistency Assessment of the Reported Composite Results

Assessment component	Reported value	Verification finding
Overall score in the narrative	72.03	Differs from the weighted-table total
Sum of the six reported weighted scores	70.13	Arithmetic sum confirmed
Weight for community contributions to tourism experiences	12.74	Reported weighted score is 14.96
Achievement for community contributions to tourism experiences	100.00%	Weighted score exceeds its stated maximum contribution

Source: Narrative and weighted-results table supplied in the manuscript.

The six weighted components sum to 70.13. However, this arithmetic agreement does not validate the composite calculation. The reported contribution for community contributions to tourism experiences exceeds its allocated weight, which is inconsistent with treating that weight as the maximum contribution on a normalised scale. The difference between the narrative and table totals creates an additional uncertainty. A final overall sustainability score and classification therefore cannot yet be established from the supplied calculations. The questionnaire data support descriptive assessment of stakeholder responses, while the composite result requires reconciliation of relationship labels, adverse-item coding, indicator weights, and normalisation procedures.

Discussion

The questionnaire findings provide a basis for examining how stakeholders perceive the relationships among resources, communities, and tourism at Gedong Songo Temple. Respondents generally expressed favourable views of resource interpretation, educational opportunities, cultural experiences, and resident–visitor interaction. The assessment of conservation contributions and community outcomes is less straightforward because several dimensions combine favourable

statements with adverse-impact statements. Accordingly, the discussion distinguishes patterns supported by the questionnaire from sustainability conclusions that require further verification.

Resource Interpretation and Visitor Experiences. The contribution of resources to tourism experiences received the highest descriptive mean. Its predominantly favourable items addressed interpretation, educational opportunities, environmental awareness, recreation, and appreciation. This pattern suggests that respondents recognised the value of the destination's resources in supporting visitor experiences.

The finding is consistent with the integrated perspective of [Tsaor et al. \(2006\)](#), in which resources support tourism through attraction quality, interpretation, and opportunities for learning. It also complements the reciprocal framework of [Ross and Wall \(1999a, 1999b\)](#), which connects tourism experiences with the natural and cultural resources on which they depend. At Gedong Songo, interpretation can help visitors understand the significance of the temple complex while connecting heritage appreciation with environmental responsibility.

However, favourable visitor assessments do not establish that resources are adequately protected. [Buckley \(2012\)](#) distinguishes sustainability aspirations from demonstrated outcomes, indicating the need to examine conservation performance separately from visitor experience. A destination may provide enjoyable recreation while facing pressures that visitors do not recognise or observe during a short visit.

The managerial implication is to connect interpretation more explicitly with responsible behaviour. Information about heritage protection, appropriate visitor conduct, waste disposal, and restricted areas could strengthen the relationship between learning and conservation. Environmental education initiatives discussed by [Cahyaningrum et al. \(2021\)](#) provide relevant local context, while research on sustainable facilities at Gedong Songo supports attention to the infrastructure through which visitor experiences are delivered ([Rahmat et al., 2020](#)).

Community Contributions and Cultural Interaction. Community contributions to tourism experiences also received a comparatively high mean. The items concerned local experiences, cultural variety, cultural exchange, and positive interaction between residents and visitors. These responses suggest that participants recognised the community as an important component of the destination experience.

Stakeholder theory supports treating residents as legitimate participants in destination management rather than solely as providers of tourism services. [Freeman \(1984\)](#) directs attention to groups affected by organisational activities, while [Donaldson and Preston \(1995\)](#) explain why stakeholder interests warrant consideration beyond their contribution to managerial objectives. Applied to Gedong Songo, these perspectives support examining residents' opportunities to influence tourism development alongside their contribution to visitor satisfaction.

[Scheyvens \(1999\)](#) further distinguishes economic, psychological, social, and political empowerment. Positive cultural interaction may contribute to recognition and community confidence, but it does not independently demonstrate equitable income distribution or influence over decisions. The favourable assessment of community contributions therefore should not be interpreted as evidence that residents receive benefits proportionate to their participation.

Management should assess who participates in tourism activities, who receives the resulting income, and whether residents can shape development priorities. These questions would help connect positive visitor experiences with meaningful local benefits. [Tosun \(2000\)](#) highlights constraints that may restrict participation, indicating that limited involvement should not automatically be attributed to a lack of community interest.

Community Welfare and Resource Stewardship. The questionnaire addresses educational opportunities, environmental awareness, economic benefits, and community involvement in resource management. These aspects are relevant to the reciprocal relationship between conservation and local welfare. Communities may support resource protection when they recognise its value and have meaningful opportunities to participate, while effective resource management can improve the conditions supporting community livelihoods.

[Reed \(2008\)](#) emphasises the design and quality of stakeholder participation in environmental management. Consultation becomes more informative when participants understand its purpose and can see how their contributions influence decisions. [Waligo et al. \(2013\)](#) similarly connect stakeholder involvement with the capacity to implement sustainable tourism. For Gedong Songo, participation should therefore extend beyond collecting opinions to include accessible processes for discussing conservation concerns and management priorities.

Nevertheless, the present questionnaire does not isolate these mechanisms. Some dimensions combine conservation-support statements with statements concerning disturbance, exploitation, and

development pressures. Their aggregate means cannot establish the balance between beneficial participation and adverse resource use until item coding is verified.

The available responses consequently identify topics for closer assessment rather than confirm the effectiveness of community stewardship. Future evaluation could examine participation in conservation activities, opportunities to contribute to planning, and the distribution of livelihood benefits. Such evidence would clarify whether community involvement supports both resource protection and local welfare.

Tourism Contributions and Environmental Pressures. The relationship between tourism and resources encompasses both potential conservation support and environmental pressures. Ticket revenue, responsible visitor behaviour, and economic contributions may support destination management, whereas pollution and damage may weaken the resources sustaining tourism. The framework of [Tsaour et al. \(2006\)](#) is useful because it treats these contributions separately from the benefits that resources provide to visitors.

The current data do not establish the relative strength of these opposing conditions. Agreement with statements about conservation contributions indicates favourable perceptions, while agreement with a statement about environmental damage indicates concern. Combining their original scores without a verified adjustment makes the aggregate result difficult to interpret.

This limitation is particularly important when discussing whether tourism revenue supports conservation. The questionnaire captures perceptions but does not provide financial records demonstrating how revenue was allocated. Similarly, perceived cleanliness or environmental pressure does not replace direct observation of resource condition. [The World Tourism Organization \(2004\)](#) recommends destination-relevant indicators that can inform monitoring and management, supporting the use of complementary evidence.

Management could therefore combine stakeholder responses with records of conservation expenditure, waste management, maintenance, and visitor-related incidents. These measures would help determine whether tourism activities generate sufficient support for resource protection and where preventive action is needed.

Tourism Benefits and Pressures on Communities. Tourism benefits and pressures on communities recorded the lowest unweighted mean, but this result should not be treated as demonstrating the weakest sustainability performance. The dimension contains statements concerning employment, income distribution, and welfare alongside congestion, safety concerns, cultural loss, and environmental damage. Disagreement with an adverse statement may represent a favourable assessment.

The questionnaire nevertheless highlights the range of outcomes that community evaluation should cover. Employment and additional income are relevant, but community welfare also involves the conditions of everyday life and the ability to retain cultural practices. [Scheyvens \(1999\)](#) provides a basis for examining these broader forms of empowerment, while [Bramwell and Lane \(2011\)](#) connect sustainability with governance arrangements and competing interests.

A more informative assessment would report perceived benefits and pressures separately before combining them within a consistently coded index. It should also distinguish resident responses from visitor and operational perspectives. Visitors can evaluate their interactions with communities, but may have limited knowledge of income distribution or long-term changes in residents' welfare. For Gedong Songo, this distinction supports strengthening direct resident participation in subsequent evaluation. Household and community evidence would help establish whether reported tourism opportunities are accessible, whether benefits are broadly shared, and whether tourism creates burdens requiring management attention.

Indicator Weights and Composite Interpretation. The reported weights place substantial emphasis on relationships concerning resources. This emphasis is conceptually compatible with the dependence of tourism on conservation, but the weights cannot establish sustainability performance by themselves. Their interpretation depends on how they were derived and applied.

[Choi and Sirakaya \(2006\)](#) demonstrate the relevance of multidimensional indicators for community tourism, while Delphi guidance stresses transparent expert selection, consultation rounds, feedback, and consensus procedures ([Okoli & Pawlowski, 2004](#); [Hsu & Sandford, 2007](#)). In the present manuscript, the distinction between an adopted weighting framework and a locally conducted Delphi process requires clarification. The weights should be attributed to their actual source rather than presented as locally validated priorities without supporting documentation.

The composite calculations also require reconciliation. The disagreement between the narrative and table totals, together with a weighted contribution exceeding its stated maximum, prevents a defensible overall classification. These issues concern the calculation and interpretation of the index;

they do not invalidate every questionnaire response. Descriptive findings remain available, but the overall score should be withheld until the procedure is verified.

Management Implications and Study Limitations. The findings support an evaluation approach that connects visitor experiences with conservation responsibilities and community interests. Resource interpretation and cultural interaction appear positively assessed, while conservation contributions and community outcomes require more detailed evidence. Management priorities should include linking interpretation to responsible conduct, documenting conservation expenditure, widening resident participation, and examining the distribution of tourism benefits.

Interpretation remains limited by the small questionnaire sample, predominance of visitor responses, unclear separation of participant groups, and reliance on perceptions. Unverified adverse-item coding and inconsistent composite calculations further restrict conclusions about overall sustainability. These conditions make the study an exploratory assessment rather than a validated destination classification. Future research should clarify stakeholder groups, strengthen resident representation, verify scoring procedures, and document any Delphi process undertaken. Repeated assessment using consistent indicators, supported by environmental, financial, and community-level evidence, would provide a stronger basis for monitoring sustainability at Gedong Songo Temple.

Conclusion

This study examined stakeholder perceptions of tourism sustainability at Gedong Songo Temple through six relationships among resources, communities, and tourism. Questionnaire responses indicated generally favourable assessments of resource interpretation, educational opportunities, cultural experiences, and resident–visitor interaction. However, conservation contributions and community outcomes require cautious interpretation because several dimensions combine favourable and adverse-impact statements without verified reverse coding. Inconsistent weighted calculations also prevent a defensible overall sustainability classification. Destination management should connect visitor education with responsible behaviour, strengthen resident participation, document tourism contributions to conservation, and assess the distribution of local benefits. The study is limited by its small sample, predominance of visitor responses, unclear stakeholder grouping, reliance on perceptions, and unresolved scoring procedures. Future research should verify indicator weights and coding, clarify the source and implementation of Delphi procedures, broaden community representation, and combine stakeholder assessments with environmental, financial, and household-level evidence to support more reliable sustainability monitoring.

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