SUSTAINABLE ECOTOURISM DEVELOPMENT STRATEGIES BASED ON COMMUNITY PARTICIPATION: A SYSTEMATIC LITERATURE REVIEW WITH IMPLICATIONS FOR CURUG CIANGIN, CIBEUSI VILLAGE, SUBANG REGENCY, INDONESIA

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Abstract. *Sustainable ecotourism offers an opportunity to connect nature conservation, local economic development, and community well-being. However, the benefits of nature-based tourism may be limited when local residents have little influence over planning, management, and the distribution of tourism revenues. This article reviews literature on community participation and sustainable ecotourism development, with particular implications for Curug Ciangin in Cibeusi Village, Subang Regency, West Java, Indonesia. A systematic literature review (SLR) approach is proposed, using searches in multidisciplinary scholarly databases and transparent eligibility criteria. The synthesis is organized thematically around community participation, environmental conservation and carrying capacity, local economic empowerment, destination governance, and tourism geography. The reviewed studies indicate that community participation should extend beyond receiving economic benefits to include decision-making, implementation, monitoring, and evaluation. Research on Indonesian destinations also identifies recurring barriers, including limited management capacity, weak coordination, unequal access to information, inadequate infrastructure, and insufficient environmental management. A sustainable strategy for a waterfall destination therefore requires collaborative governance, community capacity building, fair benefit-sharing, spatially informed visitor management, waste control, safety measures, and conservation education. These findings provide a conceptual basis for planning at Curug Ciangin; they do not constitute an empirical assessment of current conditions at the site. The final review should report database search dates, screening numbers, and the full set of included studies after the search and screening process has been completed.*

Key words: Sustainable ecotourism, community participation, waterfall tourism, tourism geography, Curug Ciangin.

Introduction

Tourism based on natural attractions is closely connected to the geographical characteristics of a destination. Waterfalls, rivers, forests, hills, and rural landscapes create distinctive attractions, while their location, accessibility, environmental sensitivity, and relationship with nearby settlements shape how tourism can be developed. From a tourism geography perspective, destination development is not only a matter of attracting visitors. It also concerns the spatial organization of tourism activities, the use of natural resources, the relationship between host communities and visitors, and the distribution of benefits and costs across a place.

Ecotourism is commonly associated with nature-based experiences, environmental responsibility, conservation, and benefits for local communities. Nevertheless, the use of the term ecotourism does not automatically ensure sustainable outcomes. Visitor growth can increase pressure on ecosystems, generate waste, create conflicts over access and revenue, and place additional demands on local infrastructure. Butarbutar and Soemarno (2013) explain that the carrying capacity of ecotourism involves ecological, physical, social, and economic dimensions, rather than simply the maximum number of visitors. This perspective is important for waterfall destinations, where the condition of trails, riverbanks, water quality, slopes, and visitor safety can influence the sustainability of tourism.

Community participation is a central principle in community-based ecotourism. Local residents possess knowledge of the landscape, cultural practices, environmental changes, and everyday needs of the destination. Their involvement can strengthen local ownership and help ensure that tourism development reflects community priorities. Indiarti and Munir (2016), in their discussion of the Osing Tourism Village in Banyuwangi, describe community-based ecotourism as an approach that connects conservation, local economic empowerment, and rural tourism development. However, participation needs to be meaningful: residents should have opportunities to contribute to planning and decisions, not merely provide services after development priorities have already been established.

Evidence from Indonesia shows that the level of community involvement may remain limited. Kia (2021), reviewing 29 studies on ecotourism in Indonesia, reports that community involvement was often concentrated at the utilization stage. The review identifies operational barriers such as limited information and centralized management, structural barriers such as limited training and weak institutional support, and cultural barriers such as low awareness. These findings suggest that participation requires deliberate institutional arrangements, access to information, and capacity development.

The relevance of these issues can be considered in relation to Curug Ciangin, located in Cibeusi Village, Subang Regency, West Java. As a waterfall-based natural attraction, the site can be examined through the interaction between physical landscape characteristics, tourism access and facilities, community livelihoods, environmental protection, and destination governance. However, this article does not assume that specific problems or management conditions have been verified at Curug Ciangin. Instead, it uses findings from relevant literature to identify strategic considerations that can guide a subsequent local assessment.

The purpose of this article is to synthesize research on strategies for sustainable ecotourism development based on community participation and to formulate implications for Curug Ciangin. The review addresses five questions: (1) How is community participation conceptualized in sustainable ecotourism? (2) What environmental management principles are relevant to waterfall destinations? (3) How can ecotourism strengthen local economic benefits? (4) What governance arrangements support inclusive and sustainable destination management? and (5) How can tourism geography inform spatial planning and visitor management?

Reseach Methods

This article is designed as a systematic literature review. The purpose of the method is to identify, screen, assess, and synthesize published studies relevant to community participation and sustainable ecotourism development. The review follows a transparent, reproducible procedure informed by PRISMA principles. Because the final database searches and screening have not yet been conducted and documented in this draft, no numerical claims are made about records identified, duplicates removed, articles screened, or studies included. Those numbers must be entered after the review is carried out.

1. Search strategy

The proposed databases are Scopus, Web of Science, ScienceDirect, Google Scholar, and relevant Indonesian scholarly indexes. Searches should be conducted using combinations of the following terms: “sustainable ecotourism”, “community participation”, “community-based ecotourism”, “community-based tourism”, “waterfall tourism”, “rural tourism”, “tourism

geography", "environmental conservation", "carrying capacity", "local empowerment", and "Indonesia". An example search string is: ("sustainable ecotourism" OR "community-based ecotourism" OR "community-based tourism") AND ("community participation" OR "local community" OR "community empowerment") AND (waterfall OR rural OR nature-based OR Indonesia). Search dates, database interfaces, and exact search strings should be recorded.

2. Inclusion and exclusion criteria

Studies are eligible when they: (1) discuss ecotourism, nature-based tourism, rural tourism, or community-based tourism; (2) address at least one of the review themes, particularly participation, conservation, local economic benefits, governance, or spatial management; (3) are scholarly articles or conference papers with identifiable publication details; and (4) provide sufficient information in the title, abstract, or full text to support thematic analysis. Studies are excluded when they are unrelated to tourism or community participation, lack sufficient bibliographic information, are duplicate records, or provide no relevant findings. Indonesian and English publications may be included, provided that their relevance and source quality can be assessed.

3. Screening and data extraction

The review process should proceed through identification, duplicate removal, title-and-abstract screening, full-text eligibility assessment, and final inclusion. Two reviewers are recommended for independent screening; disagreements should be resolved through discussion and recorded. A data extraction sheet should capture author, year, country or destination, research objective, method, tourism type, participation dimensions, environmental issues, economic outcomes, governance factors, and principal findings. The quality of each study should be considered in relation to clarity of objectives, appropriateness of methods, transparency of data collection, and support for conclusions.

4. Data synthesis

A thematic synthesis is used to organize findings into five themes: community participation; environmental conservation and carrying capacity; local economic empowerment; collaborative destination governance; and tourism geography and spatial planning. Findings are compared across destinations to identify recurring patterns, contextual differences, and strategic implications. The synthesis distinguishes evidence reported by the reviewed studies from recommendations proposed for Curug Ciangin.

Results and Discussion

Results

1. Community Participation in Sustainable Ecotourism

Community participation should be understood as a process that enables local residents to influence tourism decisions and share responsibility for destination management. Participation can occur at several levels: planning, implementation, benefit utilization, monitoring, and evaluation. Planning participation includes identifying local priorities, agreeing on development directions, and contributing to decisions about facilities, visitor activities, and conservation rules. Implementation may include guiding, operating small businesses, maintaining trails, providing visitor information, and organizing cultural or educational activities. Monitoring and evaluation allow residents to assess environmental conditions, service quality, safety, and the fairness of benefit distribution.

Kia (2021) finds that community involvement in Indonesian ecotourism has frequently been concentrated in the utilization of tourism benefits rather than in the earlier stages of planning and decision-making. The review also highlights limited information, centralized management, insufficient training, and weak coordination as barriers. This suggests that the existence of local jobs or small businesses alone is not enough to demonstrate meaningful participation. A destination may employ local residents while still excluding them from strategic decisions.

The experience discussed by Anwar, Saepudin, and Rukmana (2024) at Malela Waterfall in West Bandung is particularly relevant as a nearby West Java waterfall context. Their study emphasizes social infrastructure, training, ecotourism outreach, and strengthening community organizations as ways to raise local awareness and participation. The findings support the importance of building local capabilities and partnerships among stakeholders, rather than focusing exclusively on physical facilities.

For Curug Ciangin, these findings imply that a participation framework should provide clear opportunities for residents, community groups, village institutions, managers, and local government to contribute to planning and evaluation. Potential mechanisms include regular community meetings, transparent information about tourism income and expenditure, representation in management bodies, accessible grievance procedures, and participatory monitoring. These are proposed measures and should be adapted after consultation with the Cibeusi community

2. Environmental Conservation and Carrying Capacity

Environmental conservation is a defining element of ecotourism. In waterfall destinations, tourism activities interact with water systems, vegetation, riverbanks, slopes, wildlife habitats, and natural scenic features. Potential pressures include littering, water pollution, trail erosion, vegetation damage, noise, unsafe visitor behavior, and construction that is inconsistent with landscape conditions. Environmental management should therefore be integrated into destination planning from the beginning.

Butarbutar and Soemarno (2013) explain that ecotourism carrying capacity has at least four connected dimensions: ecological capacity, physical capacity, social capacity, and economic capacity. Ecological capacity concerns the ability of the environment to withstand tourism use without unacceptable degradation. Physical capacity concerns the ability of facilities and infrastructure to accommodate visitors. Social capacity concerns the level of tourism activity that can be absorbed without unacceptable effects on local communities. Economic capacity concerns the ability of local economic systems to accommodate tourism businesses and distribute benefits.

The waterfall destination study by Udiyana et al. (2026), which applies the Triple Bottom Line model, identifies the need to balance economic viability, community empowerment, and environmental conservation. Its findings point to the importance of spatial planning, waste management, coordination, and conservation practices. Although the study concerns Sunsa Namo Waterfall in East Nusa Tenggara rather than Curug Ciangin, its framework is relevant for understanding the linked dimensions of waterfall tourism.

For Curug Ciangin, an environmental management plan could include baseline documentation of water quality and flow, mapping of sensitive areas, trail and slope condition assessments, waste separation and collection, restrictions on activities in vulnerable zones, visitor safety procedures, and environmental interpretation for tourists. Visitor limits should not be invented in advance: they should be informed by site-specific ecological, physical, and social assessments. Periodic monitoring is necessary because rainfall, seasonal flow, visitor numbers, and infrastructure conditions can change over time.

3. Local Economic Empowerment and Benefit Sharing

Sustainable ecotourism should generate local economic opportunities while avoiding excessive dependence on tourism or unequal distribution of income. Potential benefits include employment as local guides, food and beverage businesses, homestays, transport services, handicraft production, equipment rental, and locally supplied products. These opportunities are more likely to support community well-being when local residents have access to training, business information, affordable finance, and transparent market channels.

Indiarti and Munir (2016) frame community-based ecotourism as a rural development approach that can contribute to conservation and local economic empowerment. Similarly, Ihsannudin, Kholiq, and Antriyandarti (2023), in their study of ecotourism planning at

Sakjan Lake in Meru Betiri National Park, emphasize participatory approaches and community empowerment while maintaining nature protection and visitor safety. Together, these studies indicate that economic objectives need to be integrated with conservation responsibilities.

The study of Tangkahan ecotourism by Purwoko et al. (2022) examines the economic value of tourism and visitor preferences in a community-managed nature tourism area. It illustrates how tourism-related economic value can be linked to local conservation arrangements. However, economic value alone does not establish that benefits are distributed fairly. A sustainable destination should also consider who owns businesses, who receives employment, how revenues are reinvested, and whether households with fewer resources can participate.

For Curug Ciangin, potential strategies include prioritizing local recruitment where appropriate, providing business and hospitality training, supporting village-based micro-enterprises, promoting local products, and establishing transparent mechanisms for allocating tourism revenues to maintenance and conservation. Benefit-sharing arrangements should be discussed openly with residents and documented through accountable management procedures. The feasibility of each business opportunity should be assessed against demand, seasonality, environmental limits, and local capacity.

4. Collaborative Governance and Stakeholder Coordination

Ecotourism destinations involve multiple stakeholders, including village government, tourism managers, local residents, community organizations, private businesses, visitors, and relevant government agencies. When responsibilities are unclear, management may become fragmented and environmental or service problems may not be addressed consistently. Collaborative governance can provide a shared framework for setting priorities, coordinating resources, resolving conflicts, and monitoring outcomes.

Fadli et al. (2022) argue that sustainable tourism development in Indonesia requires stronger legal and institutional frameworks, noting that implementation may be fragmented and shaped by differences in power, financial resources, and human capacity. Lawasi et al. (2025), in a review of forest-based ecotourism in Indonesia, emphasize collaborative and adaptive governance, stakeholder engagement, participatory planning, spatial justice, and ecological carrying capacity. These findings suggest that sustainability depends not only on community willingness but also on institutional support and clear rules.

A destination-level governance arrangement for Curug Ciangin could define the roles of the village government, tourism management group, community representatives, local enterprises, and relevant technical agencies. A written management plan could specify responsibilities for ticketing and financial reporting, visitor safety, waste services, infrastructure maintenance, environmental monitoring, promotion, and conflict resolution. Periodic public reporting and participatory evaluation would help strengthen trust and accountability.

5. Tourism Geography and Spatial Planning

Tourism geography contributes a spatial perspective to sustainable destination management. It examines the location of attractions, patterns of accessibility, connections between destinations and settlements, visitor movement, land use, and the spatial distribution of tourism benefits and environmental pressures. For waterfall tourism, the spatial relationship between parking areas, village facilities, trails, viewpoints, river access, sensitive habitats, and emergency routes is especially important.

Spatial planning can help distinguish areas suitable for visitor activities from areas requiring protection or restricted access. It can also identify where basic facilities should be located to minimize environmental disturbance. Mapping visitor routes and service nodes may improve circulation, reduce congestion, and support emergency response. These measures should be based on field mapping, local knowledge, and relevant planning documents rather than assumptions about the current layout of Curug Ciangin.

Sari et al. (2025), in their assessment of natural tourism opportunities in Indonesia's new capital region, identify feasibility factors such as attraction quality, accessibility, visitor demand, economic potential, safety, and technological readiness. Their findings reinforce the idea that natural attractions should not all be developed in the same way; development suitability depends on both resource characteristics and spatial context. For Curug Ciangin, a tourism geography assessment could document access routes, travel connections, land-use patterns, sensitive landscape features, visitor flows, and the relationship between tourism facilities and the surrounding village.

6. Synthesis of Previous Studies

7.

Author(s), year	Study focus	Main findings	Relevance to Curug Ciangin
Butarbutar & Soemarno (2013)	Ecotourism environmental effects	Carrying capacity includes ecological, physical, social, and economic dimensions.	Supports multidimensional visitor and environmental management.
Indiarti & Munir (2016)	Community-based ecotourism in a tourism village	CBE links conservation, local empowerment, and rural tourism development.	Supports community-centered destination planning.
Kia (2021)	Community involvement in Indonesian ecotourism; review of 29 articles	Participation often remains concentrated in benefit utilization; barriers include information, capacity, and institutional constraints.	Highlights the need for decision-making access and capacity building.
Fadli et al. (2022)	Sustainable tourism policy in Indonesia	Institutional fragmentation and differences in power and resources can constrain sustainability.	Supports clear roles and stronger coordination.
Ihsannudin et al. (2023)	Ecotourism policy planning at Sakjan Lake	Participatory planning should combine community empowerment, conservation, and visitor safety.	Supports integrated planning and local participation.
Anwar et al. (2024)	Stakeholders and participation at Malela Waterfall	Training, outreach, and stronger community organizations can improve participation.	Provides a relevant waterfall case from West Java.
Lawasi et al. (2025)	Review of forest-based ecotourism in Indonesia	Collaborative governance, spatial justice, participatory planning, and carrying capacity are recurring priorities.	Supports multi-stakeholder and spatially informed management.
Sari et al. (2025)	Natural tourism feasibility in Nusantara	Attraction, accessibility, demand, safety, and ecological limits shape development feasibility.	Supports place-based tourism geography assessment.
Udiyana et al. (2026)	Waterfall destination development using Triple Bottom Line	Economic, social, and environmental dimensions require coordinated management.	Supports an integrated sustainability framework.

The reviewed studies indicate several recurring themes. First, community participation is most meaningful when residents are involved in decisions and management, rather than only in service delivery or the use of tourism benefits. Second, environmental sustainability requires monitoring and management of ecological, physical, social, and economic carrying capacity. Third, local economic benefits need to be linked to capacity development and transparent benefit sharing. Fourth, collaborative governance is necessary to coordinate actors and clarify responsibilities. Fifth, tourism geography provides tools for understanding accessibility, land use, visitor movement, and the spatial distribution of impacts. These themes provide a conceptual basis for a strategy framework for Curug Ciangin, while site-specific priorities must be confirmed through local data.

7. Proposed Strategy Framework for Curug Ciangin

1) **Strengthen participatory institutions**. Establish or strengthen a representative destination management forum; include residents, village institutions, community groups, local businesses, and relevant agencies; publish decisions and financial summaries.

2) **Build community capacity**. Provide practical training in guiding, hospitality, first aid, waste management, interpretation, digital promotion, basic business management, and visitor services.

3) **Protect the waterfall landscape**. Map sensitive areas; monitor water and trail conditions; provide waste facilities; establish visitor codes of conduct; and align infrastructure with ecological and safety requirements.
4) **Manage visitors using evidence**. Collect visitor counts and seasonal data; assess ecological, physical, social, and economic carrying capacity; organize routes and activity zones based on field assessment.
5) **Improve local economic linkages**. Prioritize local products and services where feasible; support micro-enterprises; make opportunities accessible to different community groups; and agree on transparent revenue allocation.
6) **Develop collaborative destination governance.** Clarify roles and standard operating procedures for safety, maintenance, finance, conservation, promotion, and complaint handling; conduct periodic joint evaluation.
7) **Use place-based tourism promotion.** Communicate the waterfall's natural and village context responsibly; provide accurate access and safety information; promote visitor behavior that respects local culture and environmental limits

Disscusions

The literature suggests that sustainable ecotourism is not achieved by increasing visitor numbers alone. It requires an institutional and spatial arrangement that balances conservation, community well-being, and economic viability. The Triple Bottom Line perspective used in waterfall tourism research is useful because it prevents destination planning from focusing only on revenue or infrastructure. At the same time, community-based ecotourism literature emphasizes that local residents must have a meaningful role in deciding how tourism develops and how its benefits are distributed.

For Curug Ciangin, the most important implication is to treat community participation as both a process and an outcome. As a process, it requires access to information, representation, deliberation, and opportunities to influence decisions. As an outcome, it should be reflected in stronger local capacity, fairer economic opportunities, improved stewardship, and trust among stakeholders. Participation should therefore be evaluated through indicators such as the diversity of community representation, frequency and openness of consultation, local roles in management, training access, and transparency of benefit sharing.

The second implication concerns the integration of conservation and visitor management. A waterfall is a dynamic natural system, and tourism use may vary by season and weather. The destination's carrying capacity should therefore be assessed through ecological and physical observations, community perspectives, and operational data. Visitor limits, zoning, and infrastructure decisions should follow this assessment. A fixed visitor quota cannot be responsibly recommended without site-specific measurements.

The third implication is that local economic empowerment should be designed alongside environmental safeguards. Small businesses and employment can increase the local value retained from tourism, but commercial growth should not undermine the natural resource on which the destination depends. Transparent revenue allocation, local procurement, accessible training, and support for small enterprises can help connect tourism income with conservation and community development.

This review has limitations. The evidence base summarized here is a focused set of relevant studies identified through a scholarly search, not a completed exhaustive PRISMA review with verified screening counts. The included studies differ in destination context, research design, and outcome measures, so their findings should not be treated as directly interchangeable. In addition, no primary data were collected at Curug Ciangin. Consequently, the strategy framework is a literature-based proposal and should be validated through field observation, interviews, participatory mapping, and consultation with local stakeholders.

Conclusions and Recommendations

Conclusions

This literature-based review indicates that sustainable ecotourism development depends on the integration of community participation, environmental conservation, local economic empowerment, collaborative governance, and spatially informed destination planning. Community involvement should extend across planning, implementation, monitoring, and evaluation. Environmental management should consider ecological, physical, social, and economic carrying capacity. Economic benefits should be accessible to local residents and supported by transparent benefit-sharing arrangements. Clear institutional roles and coordination are also necessary to maintain destination quality and accountability.

For Curug Ciangin in Cibeusi Village, Subang Regency, these findings provide a conceptual foundation for a community-based sustainable ecotourism strategy. The proposed priorities are strengthening participatory management, building community capacity, protecting the waterfall environment, managing visitors based on carrying-capacity assessment, developing local enterprises, and improving stakeholder coordination. These recommendations are not claims about existing conditions at Curug Ciangin; they require validation through local empirical research.

Recommendations

1. Conduct a baseline assessment of the physical environment, water and trail conditions, accessibility, visitor patterns, facilities, and safety risks at Curug Ciangin.
2. Undertake participatory mapping and community consultations to identify local priorities, sensitive areas, livelihood opportunities, and potential tourism impacts.
3. Develop a destination management plan that specifies institutional responsibilities, environmental standards, visitor procedures, financial transparency, and benefit-sharing mechanisms.
4. Provide continuous training for local residents and tourism managers in conservation, guiding, hospitality, first aid, waste management, and small-business development.
5. Establish a monitoring system using indicators for environmental quality, visitor pressure, local employment and business participation, community satisfaction, and management accountability.
6. Complete and document the full PRISMA search and screening process before journal submission, including database names, search dates, exact search strings, duplicate counts, exclusion reasons, and final included-study numbers.

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