International Journal of Educational Review, Law, and Social Sciences (IJERLAS)
ISSN: 2808-487X
Edition: Vol. 6 No.6 (2026)
https://radjapublika.com/index.php/IJERLAS/index

Smart Geosite-Enabled Community-Based Tourism for Sustainable Destination Diversification in Ijen UNESCO Global Geopark, Indonesia

Mahfud[1,]*, Riztika Widyasari[2], Triana Kartika Santi[3], Aufa Mohammad Zaky[4], Vero Novita Rahma[5]
[1,2,3]Universitas 17 Agustus 1945 Banyuwangi, Banyuwangi, East Java, Indonesia
e-mail: mahfud@untag-banyuwangi.ac.id
*Corresponding Author: Mahfud

Keywords:
Smart Geosite; Community-Based Tourism; WebGIS; Tourism Diversification; Ijen UNESCO Global Geopark

Article Info:
Received:
14/09/2026
Revised:
19/09/2026
Accepted:
29/10/2026
Published:
04/11/2026

ABSTRACT

Smart tourism is often framed as technology-intensive destination management, but rural geopark villages require digital tools that reinforce community ownership and local interpretation. This study develops a Smart Geosite-Enabled Community-Based Tourism (SG-CBT) framework for five buffer villages of the Ijen UNESCO Global Geopark, Indonesia. It asks how village readiness shapes digital priorities, which smart-geosite functions can connect dispersed tourism assets, and how digital governance can retain benefits within communities. The article re-analyzes the 2026 mixed-method dataset comprising 300 household respondents, five participatory mapping focus groups, 13 institutional interviews, 60 tourism potentials, and GIS-based accessibility analysis. Results show an average CBT Readiness Index of 77.6, with substantial inter-village variation. Internet-connectivity readiness averages 72.6 and signage/interpretation readiness 73.2, indicating that digitalization must be sequenced with capacity building. Community priorities reinforce this conclusion: skills training ranks first (79.0%), followed by product development and packaging (70.8%), marketing and promotion (70.2%), and infrastructure improvement (67.0%). The SG-CBT framework integrates differentiated village readiness, WebGIS spatial intelligence, QR-based and narrative digital interpretation, local-enterprise and multi-village route integration, and community-controlled governance with socio-ecological monitoring. The contribution is a place-based smart-tourism model that shifts Smart Geosite development from a technology-first approach to a community-governed destination ecosystem for rural UNESCO Global Geoparks.

This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International (CC BY-SA 4.0)

How to cite:
DOI: https://doi.org/10.5281/ijerlas.v6i6.6471

Introduction

UNESCO Global Geoparks are increasingly expected to combine geoheritage conservation, education, local development, and tourism within one territorial system. In that setting, the critical management question is no longer whether technology should be used, but how it can convert dispersed heritage assets into accessible knowledge and locally retained value without weakening community authority. Smart-tourism scholarship explains that data, connectivity, digital platforms, and networked stakeholders can improve destination competitiveness, information exchange, and visitor experience; however, it also warns that technology alone is insufficient when leadership, human capital, social capital, and governance are weak (Boes et al., 2016; Buhalis & Amaranggana, 2015; Del Chiappa & Baggio, 2015; Gretzel et al., 2015; Gretzel et al., 2015). This concern is especially important in rural geoparks. Smart-destination concepts were largely developed around cities or technologically mature destinations, where sensor systems, platform integration, and real-time services are easier to institutionalize. Recent work increasingly connects

smart tourism with sustainability indicators and destination transformation, but the policy challenge remains how to translate digital capability into measurable social and ecological gains (Hall, 2019; Ivars-Baidal et al., 2023; Lee et al., 2020; Shafiee et al., 2023). Geoparks add another layer: geological knowledge must be interpreted for non-specialist visitors while conservation limits and local meanings are respected. Geoeducation research shows that interpretation quality influences whether visitors understand why geosites matter, while recent studies emphasize participatory, cultural, and management functions of geodiversity interpretation (Farsani et al., 2012; Fernandes et al., 2021; Li et al., 2022; Toma & Drăghici, 2026; Štrba & Palgutová, 2024).

Community-Based Tourism (CBT) provides the governance logic required for this translation. CBT places residents in decision-making, ownership, service provision, and benefit distribution rather than treating them as a labor pool around a flagship attraction. Yet meaningful participation is constrained by unequal capacity, weak organizations, limited market access, and tokenistic consultation. These issues are documented internationally and in Indonesian tourism villages, where community institutions can generate strong local value when they receive adequate capacity and authority (Diana & Setiawan, 2021; Giampiccoli & Saayman, 2018; Iqbal et al., 2021; Johari et al., 2021; Moscardo, 2008; Okazaki, 2008; Priatmoko et al., 2021; Ristiawan & Tiberghien, 2021; Tosun, 2000).

The Ijen UNESCO Global Geopark provides a suitable setting to examine the intersection of smart tourism and community governance. Tourism remains strongly associated with the Ijen Crater, while the surrounding villages possess coffee landscapes, palm-sugar production, terraced rice fields, springs, waterfalls, Osing culture, dolmen sites, homestays, culinary businesses, and other creative-economy assets. Indonesian geopark studies have similarly shown that diversified products, educational interpretation, local entrepreneurship, and community-based conservation can spread tourism value beyond a single geosite (Aziza et al., 2023; Harahap & Purnama, 2024; Ibrahim & Adiputra, 2023; Jane & Pawitan, 2021; Prawira et al., 2023; Sulistyo et al., 2023).

The broader 2026 Ijen research developed a Sustainable Community-Based Geopark Destination model. This article addresses a distinct analytical problem: how the digital "Smart Geosite" component should be designed and sequenced across villages with different levels of readiness. The novelty is therefore not another generic smart-tourism platform. It is a place-based SG-CBT architecture in which digital functions are differentiated by community capacity, spatial role, tourism assets, and institutional maturity. The study asks: (1) How do variations in CBT readiness, digital infrastructure, and interpretation capacity shape Smart Geosite priorities across the five buffer villages? (2) Which digital functions can best integrate 60 tourism potentials into multi-village tourism pathways and local-enterprise transactions? and (3) Which governance principles are required so that digitalization strengthens community ownership, benefit distribution, and conservation? Indonesia's experience with digital tourism villages and community-based destination marketing indicates that digital literacy, infrastructure, mentoring, and locally controlled content must develop together (Fatmawati & Sulistyo, 2022; Pranita et al., 2021; Rachmidiani & Edison, 2023).

Method

This article uses a focused secondary analysis and design synthesis of the 2026 mixed-method study on five buffer villages—Tamansari, Licin, Banjar, Kalianyar, and Sempol. The original research followed a convergent mixed-method logic, combining quantitative household data with qualitative institutional evidence and participatory spatial mapping. This design is appropriate where measurable readiness indicators must be interpreted alongside local knowledge and organizational conditions (Creswell, 2018; Creswell & Plano Clark, 2018).

The dataset comprises 300 household respondents (60 per village), stratified among direct tourism participants, indirect participants, and non-tourism households; five village FGDs with 12–15 participants each; and 13 institutional interviews involving five Pokdarwis leaders, five village heads, and three geopark-management staff. The household instrument covered livelihood profile, tourism participation and income, perceptions of CBT, institutional involvement, and development preferences. The perception scale reported acceptable internal consistency (Cronbach's alpha 0.87). Participatory mapping identified tourism assets and priorities, while GIS analysis connected attractions to access, amenities, village roles, and movement corridors.

For the present article, analysis proceeded in four stages. First, the updated CBT Readiness Index was used to compare community capacity, institutional strength, infrastructure, and attraction quality. Second, two digitally relevant sub-indicators—Internet connectivity and signage/interpretation—were extracted to identify implementation bottlenecks. Third, the 60 mapped tourism potentials and community priority rankings were cross-read to determine digital functions with direct livelihood relevance. Fourth, a design matrix translated these findings into five Smart Geosite functions: spatial intelligence, digital interpretation, local-enterprise linkage, multi-village route integration, and community governance/monitoring. The resulting framework is a design architecture, not a claim that a fully operational platform has already been deployed.

The analytical principle was "technology as enabler." WebGIS, QR codes, digital guides, storytelling, route information, booking interfaces, and MSME catalogues were assessed according to whether they could increase interpretation quality, navigation, market access, and local transactions while preserving the role of local guides. This follows smart-destination research that treats technology as one component of a wider social and institutional ecosystem rather than a substitute for governance (Berkes, 2009; Poudel et al., 2016).

Table 1. Data sources and analytical role

Data source	Coverage	Analytical role
Household survey	300 respondents; 60 per village	Livelihood profile, CBT perceptions, development preferences
Participatory mapping	5 FGDs; 12–15 participants each	Tourism assets, routes, village priorities
Institutional interviews	13 interviews	Pokdarwis capacity, coordination, governance
GIS and accessibility mapping	Five villages and Ijen corridor	Spatial role, access, amenity, route integration
CBT Readiness Index	Four major dimensions plus sub-indicators	Differentiated Smart Geosite sequencing

Results and Discussion

Spatial asset diversity and the case for networked Smart Geosites

Participatory mapping identified 60 tourism potentials across the five villages. Agrotourism is especially prominent, including coffee plantations and processing, palm-sugar production, terraced agricultural landscapes, and other farm experiences. Geotourism and nature assets include the Ijen Crater access corridors, Blawan hot springs and waterfall, Gentongan Waterfall, springs, geological formations, forest landscapes, and panoramic viewpoints. Cultural, culinary, homestay, and MSME assets add a second layer of visitor experience. This spatial diversity demonstrates that the core digital problem is not "promoting Ijen" as a single attraction, but helping visitors understand and combine complementary experiences across villages (Khoshkam & Jaafar, 2016; Wu et al., 2021).

The livelihood data reinforce this logic. Of 300 respondents, 26.6% participated directly in tourism and 45.2% indirectly, while 28.2% did not participate. Direct participants reported a much larger tourism share of household income than indirect participants, but indirect participation often complemented agriculture rather than replacing it. This suggests that a Smart Geosite should deliberately connect visitor information to products and services supplied by farmers, homestays, food producers, transport providers, craftspeople, and local guides. Tourism-agriculture linkages are particularly important where diversification is intended to reduce vulnerability rather than create a new dependence on visitor demand (Ari et al., 2025; Fitrianto et al., 2024; Parmawati et al., 2018).

Village-differentiated readiness for digitalization

The average CBT Readiness Index is 77.6, but village scores differ: Tamansari 85.5, Sempol 83.5, Licin 75.3, Banjar 73.2, and Kalianyar 70.7. The pattern matters because identical digital interventions would create unequal implementation risk. Internet-connectivity readiness averages 72.6 (Tamansari 75, Licin 72, Banjar 70, Kalianyar 70, Sempol 76), while signage and interpretation readiness averages 73.2 (Tamansari 80, Licin 72, Banjar 68, Kalianyar 66, Sempol 80). The data indicate that advanced booking and content integration may be realistic in the gateway villages, while foundational interpretation and institutional strengthening remain more urgent elsewhere.

Tamansari is suited to a quality-enhancement strategy: multilingual QR interpretation, integrated homestay and coffee-experience booking, visitor-flow information, and curated cultural storytelling. Sempol similarly can prioritize safety information, route timing, geosite interpretation, and links between Ijen, Blawan, hot springs, and coffee estates. Licin can function as a digital corridor hub that bundles coffee, palm sugar, culinary stops, and onward routes. Banjar requires stronger product packaging for palm sugar and terraced landscapes, using story-based QR points and MSME catalogues. Kalianyar should begin with basic interpretive content, directional information, dolmen and waterfall narratives, and a simple local-enterprise directory before moving toward transaction-heavy functions. This differentiation reflects the broader principle that community capacity and infrastructure determine what kind of digitalization is sustainable (Apriani, 2023).

Table 2. Village-differentiated Smart Geosite readiness profile

Village	CBT Readiness	Internet	Signage/Interpretation	Priority Smart Geosite pathway
Tamansari	85.5	75	80	Advanced interpretation, homestay/coffee booking, visitor-flow information
Licin	75.3	72	72	Digital corridor hub, route integration, MSME catalogue
Banjar	73.2	70	68	Agrotourism storytelling, palm-sugar and terrace mapping, local product linkage
Kalianyar	70.7	70	66	Foundational QR/signage, dolmen-waterfall interpretation, enterprise directory
Sempol	83.5	76	80	Geosite safety, route timing, Blawan/Jampit integration, guide linkage
Average	77.6	72.6	73.2	Staged implementation based on readiness

Community priorities: why capacity must precede platform complexity

Community rankings provide a clear sequencing signal. Skills training was the highest overall priority (79.0%), followed by product development and packaging (70.8%), marketing and promotion (70.2%), infrastructure improvement (67.0%), inter-village coordination (61.2%), partnership development (61.0%), access to capital (59.6%), Pokdarwis strengthening (58.0%), benefit-sharing mechanisms (54.8%), and environmental management (51.0%). The implication is that Smart Geosite development should not begin with a sophisticated application. It should begin with content capability, digital literacy, visitor-service standards, product curation, institutional responsibility, and an update workflow (Fatmawati & Sulistyo, 2022; Pranita et al., 2021).

Indonesian evidence supports this staged approach. Digital tourism-village initiatives show that destination websites, social media, online promotion, and e-commerce are most useful when stakeholders possess the skills and organizational support to maintain them. Digital marketing can improve destination visibility, but its value depends on credible products and an image visitors can understand and trust. Therefore, the Ijen Smart Geosite should be built as a modular system: a minimum viable layer for maps and interpretation, followed by booking and enterprise integration, and finally monitoring and adaptive-management functions (Rachmidiani & Edison, 2023).

Table 3. Community development priorities relevant to Smart Geosite implementation

Priority	Overall respondents ranking in top three (%)	Implication for SG-CBT
Skills training	79.0	Digital literacy, guiding, hospitality, interpretation
Product development & packaging	70.8	Curated experiences and bookable products
Marketing & promotion	70.2	Shared destination narrative and channel management
Infrastructure	67.0	Access, signage, connectivity, visitor facilities
Inter-village coordination	61.2	Joint routes, standards, calendar, data governance
Partnership development	61.0	Travel, university, geopark-management and market links
Access to capital	59.6	Small enterprise digitalization and service upgrades
Pokdarwis strengthening	58.0	Content ownership and operational responsibility
Benefit sharing	54.8	Transparent transaction and conservation allocation
Environmental management	51.0	Monitoring, waste, carrying-capacity information

The SG-CBT functional architecture

The proposed SG-CBT framework contains five mutually dependent functions. First, village readiness determines the depth and sequence of digital interventions. Second, spatial intelligence uses WebGIS to combine attractions, access routes, amenities, risks, and village service nodes. Third, digital interpretation uses QR codes, short multilingual narratives, audio/visual micro-content, and local-guide prompts to translate geological, agricultural, historical, and

cultural knowledge. Fourth, local-market linkage connects each place to homestays, guides, food, coffee, palm sugar, souvenirs, and other community products. Fifth, community governance specifies who owns content, who updates it, how visitor data are used, and how digital transactions contribute to community and conservation funds (Petrović et al., 2023).

This architecture deliberately differs from technology-first smart-destination models. It treats a Smart Geosite as a socio-technical interface: the visitor sees a map, story, route, service, or booking option, but behind the interface stands a community rule about knowledge, representation, pricing, benefit distribution, and conservation. This is consistent with smart-ecosystem scholarship emphasizing interactions among technological and non-technological actors, and with co-management research that stresses bridging institutions and shared authority (Hernández Gutiérrez & Povedano Marrugat, 2023; Wang et al., 2022; Zhu et al., 2022).

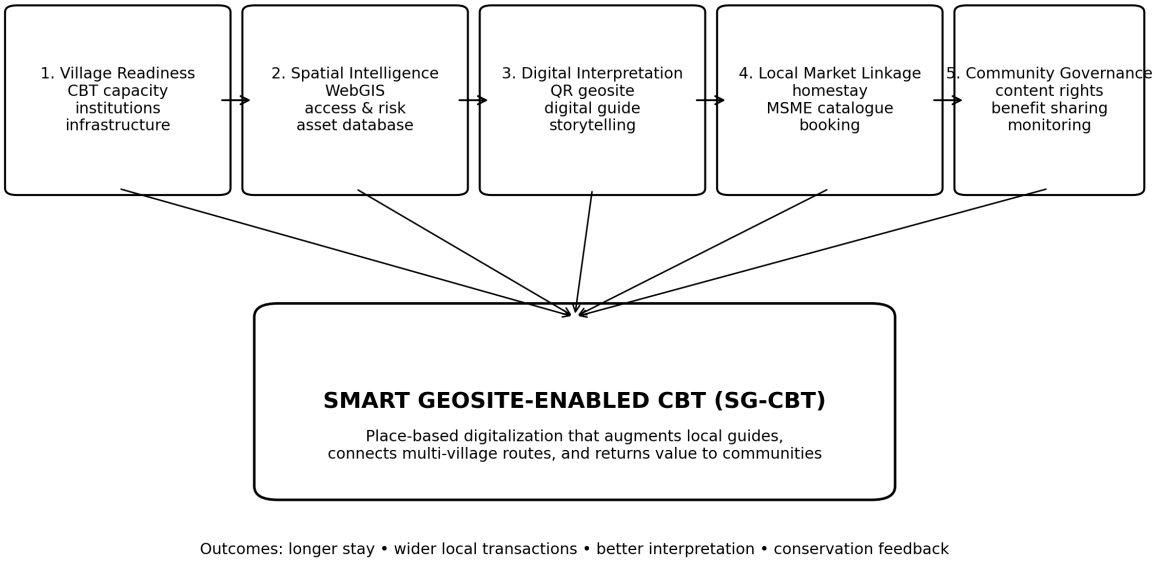


Figure 1. Smart Geosite-Enabled Community-Based Tourism (SG-CBT) framework. Source: Authors' elaboration from the 2026 Ijen dataset.

Table 4. Smart Geosite functional architecture

Function	Core tools	Community value
Spatial intelligence	WebGIS, digital map, access/amenity/risk layers	Connects dispersed assets and supports route planning
Digital interpretation	QR codes, multilingual micro-stories, digital guide	Improves geoeducation while supporting local guides
Local-market linkage	Homestay/MSME catalogue, booking links, product pages	Converts visits into local transactions
Multi-village packaging	Route planner, event calendar, themed circuits	Extends stay and disperses visitor spending
Governance & monitoring	Content roles, update protocol, benefit tracking, indicators	Keeps data and value accountable to communities

Multi-village route integration and distributed value creation

The Smart Geosite layer can operationalize four cross-village product pathways already identified in the research: an Ijen Geological Heritage Circuit; an Ijen Coffee and Agrotourism Trail; an Ijen Cultural Immersion Experience; and an Ijen MSME and Creative Economy Tour. A WebGIS interface can expose the relationships among places rather than listing attractions independently. For example, a visitor moving from Ijen to Blawan can be offered a coffee stop, a local meal, a homestay, or a heritage interpretation point. A visitor in Banjar can move from palm-sugar production to terraced fields, local culinary products, and a route toward Licin or Tamansari.

This network logic is important because destination competitiveness does not automatically guarantee local distribution. Network-based smart tourism can improve knowledge flows, but community rules are required to determine which businesses are visible, how routes are rotated, and how benefits are shared. Without these rules, digital platforms can reproduce the same concentration that the CBT model is intended to correct (Boes et al., 2016; Del Chiappa & Baggio, 2015).

Digital governance, conservation, and monitoring

A Smart Geosite system should also generate feedback for sustainability management. The research model already proposes indicators for economic benefits (local transactions, tourism income, length of stay), social participation, cultural authenticity and regeneration, environmental conditions (waste, geosite condition, water, vegetation, carrying capacity), governance (meetings, transparency, partnerships, conflict resolution), and visitor experience. Integrating selected indicators into a community dashboard would make digitalization useful not only for promotion but also for adaptive management (Ivars-Baidal et al., 2023; Leung et al., 2018).

Conservation must remain visible in the digital visitor journey. Interpretation can explain why volcanic, hydrological, agricultural, and archaeological assets require specific behavior; route information can redirect pressure; and low-waste or carrying-capacity messages can be placed at decision points. Indonesian geopark research demonstrates that tourism creates both livelihood opportunities and environmental pressures, while Pokdarwis strategies can mediate conflicts between use and conservation. The SG-CBT framework therefore links digital visibility with conservation responsibility rather than treating traffic growth as the main success metric (Aziza et al., 2023; Sulistyo et al., 2023).

Theoretical and practical contribution

The first theoretical contribution is to relocate "smartness" from the technology layer to the governance relationship among place, community, data, and visitor. In rural geoparks, the most sophisticated platform is not necessarily the smartest solution; the smart solution is the one that matches village capability, improves interpretation, extends local value chains, and produces information for conservation decisions. This modifies mainstream smart-tourism logic by placing differentiated community readiness before technology intensity (Gretzel et al., 2015; Lee et al., 2020).

Second, the framework connects Smart Geosite design to CBT rather than destination marketing alone. This connection is particularly important in Indonesia, where tourism villages rely on Pokdarwis, BUMDes, informal producer networks, and local cultural authority. The digital interface must therefore be institutionally embedded. Evidence from Indonesian CBT shows that local empowerment, institutional participation, and transparent management influence whether tourism becomes genuinely community-based (Diana & Setiawan, 2021; Johari et al., 2021; Nafidah et al., 2021).

Third, the framework advances the earlier SCBGD model by specifying the digital mechanism through which multi-village diversification can become operational. The SG-CBT layer converts static inventories into connected visitor pathways; links interpretation to transactions; and connects transactions to governance and monitoring. It thus provides a practical bridge between spatial planning, digital tourism, and sustainable livelihood diversification (Poudel et al., 2016).

Conclusion

This study develops a Smart Geosite-Enabled Community-Based Tourism (SG-CBT) framework for five buffer villages of the Ijen UNESCO Global Geopark. The central finding is that digitalization should be differentiated rather than uniform. The average CBT Readiness Index of 77.6 conceals meaningful differences among Tamansari, Sempol, Licin, Banjar, and Kalianyar, while Internet connectivity and signage/interpretation indicators show that technical readiness is only moderate in several villages. Community priorities further demonstrate that training, product packaging, marketing, and infrastructure remain prerequisites for effective digital transformation.

The framework integrates village readiness, WebGIS-based spatial intelligence, QR and narrative interpretation, local-enterprise linkage, multi-village route integration, and community-controlled governance. Its scientific contribution is a shift from technology-first smart tourism toward a place-based socio-technical model in which digital tools augment local guides, local knowledge, and local enterprise. Its practical application is a staged Smart Geosite roadmap: foundational mapping and interpretation; integrated route, booking, and MSME functions; followed by monitoring, carrying-capacity management, and benefit-sharing.

The study has limitations. It develops and analytically validates a design architecture from an existing mixed-method dataset rather than evaluating a fully deployed digital platform. Visitor-side usability, willingness to pay, digital behavior, real-time movement data, and longitudinal environmental indicators were not directly tested. Future research should pilot the SG-CBT interface in selected villages, conduct usability experiments with tourists and guides, measure changes in local transactions and length of stay, and evaluate whether digital routing actually disperses visitor pressure and benefits. Comparative application in other rural UNESCO Global Geoparks would further test the framework's transferability.

Acknowledgement

This research was supported by the Fundamental Research Grant – Regular Scheme, funded by the Ministry of Higher Education, Science, and Technology of the Republic of Indonesia (Kemendiktisaintek), Fiscal Year 2026. The authors thank the village governments and communities of Tamansari, Licin, Banjar, Kalianyar, and Sempol; the Ijen UNESCO Global Geopark Management; Pokdarwis members; local MSME actors; and all field participants who contributed knowledge and time to the research.

Author Contributions Statement

TKS, M, and RW jointly contributed to conceptualization, review of field evidence, interpretation of findings, manuscript development, and critical revision. All authors reviewed the manuscript and approved the version prepared for submission. The authors should verify this statement against their final contribution record before submission.

AI Usage Statement

Generative AI was used as supervised assistance in organizing and drafting portions of this manuscript, improving English readability, and formatting references. The underlying research design, field data, quantitative results, substantive interpretation, and scholarly conclusions derive from the authors' research materials and remain the responsibility of the authors. This disclosure should be reconciled with the final IJERLAS AI policy before submission; the authors retain full responsibility for accuracy, originality, and academic integrity.

Conflict of Interest

The authors declare no conflict of interest.

References

Apriani, D. I. (2023). The Perception of Bantaragung Village Community toward the Factors Affecting the Development of a Tourism Village through Sustainable Livelihood Approach. Jurnal Ilmu Administrasi, 20(1), 1–18. https://doi.org/10.31113/jia.v20i1.930

Ari, A. R., Sasongko, G., & Lasso, A. H. (2025). Sustainable Livelihoods for Tourism: Lessons from the Sambi Village Transition. International Journal of Social Science Research and Review, 8(9), 1–15. https://doi.org/10.47814/ijssrr.v8i9.2867

Aziza, B., Muntasib, E. K. S. H., & Hermawan, R. (2023). Impact of Tourism Activity in Ciletuh-Palabuhanratu Geopark (CPG), Sukabumi, West Java. Media Konservasi, 28(1), 43–50. https://doi.org/10.29244/medkon.28.1.43-50

Berkes, F. (2009). Evolution of Co-Management: Role of Knowledge Generation, Bridging Organizations and Social Learning. Journal of Environmental Management, 90(5), 1692–1702. https://doi.org/10.1016/j.jenvman.2008.12.001

Boes, K., Buhalis, D., & Inversini, A. (2016). Smart Tourism Destinations: Ecosystems for Tourism Destination Competitiveness. International Journal of Tourism Cities, 2(2), 108–124. https://doi.org/10.1108/IJTC-12-2015-0032

Buhalis, D., & Amaranggana, A. (2015). Smart tourism destinations enhancing tourism experience through personalisation of services. In I. Tussyadiah & A. Inversini (Eds.), Information and communication technologies in tourism 2015 (pp. 377–389). Springer. https://doi.org/10.1007/978-3-319-14343-9_28

Creswell, J. W. (2018). Research design: Qualitative, quantitative, and mixed methods approaches (5th ed.). SAGE.

Creswell, J. W., & Plano Clark, V. L. (2018). Designing and conducting mixed methods research (3rd ed.). SAGE.

Del Chiappa, G., & Baggio, R. (2015). Knowledge Transfer in Smart Tourism Destinations: Analyzing the Effects of a Network Structure. Journal of Destination Marketing & Management, 4(3), 145–150. https://doi.org/10.1016/j.jdmm.2015.02.001

Diana, D., & Setiawan, A. (2021). Evaluasi Penerapan Community Based Tourism (CBT). Efficient: Indonesian Journal of Development Economics, 4(1), 1044–1065. https://doi.org/10.15294/efficient.v4i1.42541

Farsani, N. T., Coelho, C., & Costa, C. (2012). Geotourism and Geoparks as Gateways to Socio-Cultural Sustainability in Qeshm Rural Areas, Iran. Asia Pacific Journal of Tourism Research, 17(1), 30–48. https://doi.org/10.1080/10941665.2011.610145

Fatmawati, I., & Sulistyo, A. (2022). Peningkatan Daya Saing Objek Wisata Berbasis Masyarakat melalui Strategi Digital Marketing. JPPM (Jurnal Pengabdian dan Pemberdayaan Masyarakat), 6(2), 383–391. https://doi.org/10.30595/jppm.v6i2.12400

Fernandes, G. J. P., Tracana, R. B., & Castro, E. (2021). Geoeducation and tourism in Estrela UNESCO Global Geopark (Portugal) and its contributions to the construction of a sustainable destination. In Geoparks of the world: Development, management and education (pp. 109–128). Springer. https://doi.org/10.1007/978-3-030-69193-6_7

Fitrianto, A. R., Halim, A., & McMichael, H. (2024). Empowering a Local Economy in Indonesia through Tourism and Good Practice. HASSS, 24(1), 261046. https://doi.org/10.69598/hasss.24.1.261046

Giampiccoli, A., & Saayman, M. (2018). Community-based tourism development model and community participation. African Journal of Hospitality, Tourism and Leisure, 7(4), 1–27.

Gretzel, U., Werthner, H., Koo, C., & Lamsfus, C. (2015). Conceptual Foundations for Understanding Smart Tourism Ecosystems. Computers in Human Behavior, 50, 558–563. https://doi.org/10.1016/j.chb.2015.03.043

Gretzel, U., Sigala, M., Xiang, Z., & Koo, C. (2015). Smart Tourism: Foundations and Developments. Electronic Markets, 25(3), 179–188. https://doi.org/10.1007/s12525-015-0196-8

Hall, C. M. (2019). Constructing Sustainable Tourism Development: The 2030 Agenda and the Managerial Ecology of Sustainable Tourism. Journal of Sustainable Tourism, 27(7), 1044–1060. https://doi.org/10.1080/09669582.2018.1560456

Harahap, M. A. K., & Purnama, Y. (2024). Menggali Peluang Ekowisata dan Pemberdayaan Masyarakat Lokal melalui Pengembangan Paket Wisata Berbasis Tipologi Geologi di Ciletuh-Palabuhanratu UNESCO Global Geopark. Jurnal Geosains West Science, 2(1), 1–15. https://doi.org/10.58812/jgws.v2i01.992

Hernández Gutiérrez, L. E., & Povedano Marrugat, E. (2023). Asignatura Pendiente de la Co-Gestión en el Geoturismo: Análisis del Geoparque Global de El Hierro. PASOS Revista de Turismo y Patrimonio Cultural, 21(1), 1–18. https://doi.org/10.25145/j.pasos.2023.21.003

Ibrahim, M. M., & Adiputra, A. (2023). Analisis Geopark Ciletuh–Palabuhanratu sebagai Daya Tarik Wisata Berbasis Edukasi. Satwika: Kajian Ilmu Budaya dan Perubahan Sosial, 7(2), 1–15. https://doi.org/10.22219/satwika.v7i2.28037

Iqbal, M., Elianda, Y., Nurhadiyanti, N., & Akbar, A. (2021). Community-based ecotourism in Indonesia: A case study in Nglanggeran Tourism Village. Jurnal Good Governance, 17(1). https://doi.org/10.32834/gg.v17i1.252

Ivars-Baidal, J. A., Vera-Rebollo, J. F., Perles-Ribes, J., Femenia-Serra, F., & Celdrán-Bernabeu, M. A. (2023). Sustainable tourism indicators: What's new within the smart city/destination approach? Journal of Sustainable Tourism, 31(7), 1556–1582. https://doi.org/10.1080/09669582.2021.1876075

Jane, O., & Pawitan, G. (2021). Community-Based Ecotourism Model for Development UNESCO Global Geopark: A Case Study of UGG Batur Bali, Ciletuh-Palabuhanratu West Java, and Toba Caldera North Sumatra. Journal of Indonesian Tourism and Development Studies, 9(1), 1–12. https://doi.org/10.21776/ub.jitode.2021.009.01.08

Johari, M., Azizurrohman, M., & Al-Qusyairi, Y. S. (2021). Supporting and Inhibiting Factors of Community Based Tourism Management: A Case Study of Setanggor Village. Journal of Applied Sciences in Travel and Hospitality, 4(2), 60–66. https://doi.org/10.31940/jasth.v4i2.60-66

Khoshkam, M., & Jaafar, M. (2016). A Community-Based Geotourism Entrepreneurship: A Case of Kilim Geopark, Malaysia. International Journal of Social Ecology and Sustainable Development, 7(4), 51–63. https://doi.org/10.4018/IJSESD.2016100104

Koens, K., Postma, A., & Papp, B. (2018). Is Overtourism Overused? Understanding the Impact of Tourism in a City Context. Sustainability, 10(12), 4384. https://doi.org/10.3390/su10124384

Lee, P., Hunter, W. C., & Chung, N. (2020). Smart Tourism City: Developments and Transformations. Sustainability, 12(10), 3958. https://doi.org/10.3390/su12103958

Leung, Y.-F., Spenceley, A., Hvenegaard, G., & Buckley, R. (Eds.). (2018). Tourism and visitor management in protected areas: Guidelines for sustainability. IUCN. https://doi.org/10.2305/IUCN.CH.2018.PAG.19.en

Li, Q. J., Ng, Y., & Wu, R. R. (2022). Strategies and Problems in Geotourism Interpretation: A Comprehensive Literature Review of an Interdisciplinary Fossil Area. International Journal of Geoheritage and Parks, 10(1), 27–46. https://doi.org/10.1016/j.ijgeop.2022.02.001

Moscardo, G. (2008). Building community capacity for tourism development. In G. Moscardo (Ed.), Building community capacity for tourism development (pp. 1–15). CABI. https://doi.org/10.1079/9781845934477.0001

Nafidah, L. N., Pujiati, L., & Hendrawan, S. A. (2021). What role can community-based tourism have in sustainable development? Advances in Social Science, Education and Humanities Research, 547, 1–8. https://doi.org/10.2991/ASSEHR.K.210413.062

Okazaki, E. (2008). A Community-Based Tourism Model: Its Conception and Use. Journal of Sustainable Tourism, 16(5), 511–529. https://doi.org/10.1080/09669580802159594

Parmawati, R., Saktiawan, Y., & Wibowo, F. A. A. (2018). Analysis of Village Tourism Development in Sawahan, Trenggalek Regency, Indonesia: A Sustainable Livelihood Approach. E-Journal of Tourism, 5(1), 1–12. https://doi.org/10.24922/EOT.V5I1.35181

Petrović, M. D., Lukić, D., Radovanović, M., & Tretiakova, T. N. (2023). How Can Tufa Deposits Contribute to the Geotourism Offer? The Outcomes from the First UNESCO Global Geopark in Serbia. Land, 12(2), 285. https://doi.org/10.3390/land12020285

Poudel, S., Nyaupane, G. P., & Budruk, M. (2016). Stakeholders' Perspectives of Sustainable Tourism Development: A New Approach to Measuring Outcomes. Journal of Travel Research, 55(4), 465–480. https://doi.org/10.1177/0047287514563166

Pranita, D., Kesa, D. D., Marsdenia,, & Arifin, A. S. (2021). Digitalization Methods from Scratch Nature towards Smart Tourism Village; Lessons from Tanjung Bunga Samosir, Indonesia. Journal of Physics: Conference Series, 1933(1), 012053. https://doi.org/10.1088/1742-6596/1933/1/012053

Prawira, M. F. A., Budisetyorini, B., & Salam, D. A. (2023). Ciletuh Geopark Destination Development: Integrating Alternative Food in Hanjeli Tourism Village and Surrounding Destinations. Journal of Tourism, Hospitality and Travel Management, 1(2), 1–15. https://doi.org/10.58229/jthtm.v1i2.139

Priatmoko, S., Kabil, M., Purwoko, Y., & Dávid, L. D. (2021). Rethinking Sustainable Community-Based Tourism: A Villager's Point of View and Case Study in Pampang Village, Indonesia. Sustainability, 13(6), 3245. https://doi.org/10.3390/su13063245

Rachmidiani, A. N., & Edison, E. (2023). Pengaruh Pemasaran Digital dan Citra Destinasi terhadap Keputusan Berkunjung di Desa Wisata Lebakmuncang Kabupaten Bandung. Tourism Scientific Journal, 8(2), 174–190. https://doi.org/10.32659/tsj.v8i2.282

Ristiawan, R., & Tiberghien, G. (2021). A Critical Assessment of Community-Based Tourism Practices in Nglanggeran Ecotourism Village, Indonesia. Journal of Indonesian Tourism and Development Studies, 9(1), 26–37. https://doi.org/10.21776/ub.jitode.2021.009.01.04

Shafiee, S., Jahanyan, S., Rajabzadeh Ghatari, A., & Hasanzadeh, A. (2023). Developing Sustainable Tourism Destinations through Smart Technologies: A System Dynamics Approach. Journal of Simulation, 17(4), 477–498. https://doi.org/10.1080/17477778.2022.2030656

Singgalen, Y. A., Sasongko, G., & Wiloso, P. G. (2019). Ritual Capital for Rural Livelihood and Sustainable Tourism Development in Indonesia. Journal of Tourism and Fiscal Management, 25(2), 115–130. https://doi.org/10.7226/JTFM.25.2.115

Sulistyo, A., Rijanta, R., Hadna, A. H., & Giyarsih, S. R. (2023). Group of Community-Based Tourism Awareness (Pokdarwis) Strategies in Addressing Conflicts in Utilization and Conservation of the Environment. Forum Ilmu Sosial, 50(2), 70–83. https://doi.org/10.15294/fis.v50i2.44799

Toma, C., & Drăghici, C. C. (2026). Multifunctional Role of Geodiversity Interpretation in UNESCO Global Geoparks: A Narrative-Systemic Review. Geoheritage, 18, 123. https://doi.org/10.1007/s12371-026-01351-1

Tosun, C. (2000). Limits to Community Participation in the Tourism Development Process in Developing Countries. Tourism Management, 21(6), 613–633. https://doi.org/10.1016/S0160-7383(00)00009-1

Wang, Y., Zhang, X., & Liu, L. (2022). Spatiotemporal Evolution and Driving Factors of Tourism-Ecology Coupling Coordination in Geopark Destinations. Journal of Cleaner Production, 369, 133379. https://doi.org/10.1016/j.jclepro.2022.133379

Wu, L., Jiang, H., & Chen, W. (2021). Geodiversity, geotourism, geoconservation, and sustainable development in Xiangxi UNESCO Global Geopark—A case study in ethnic minority areas. Geoheritage, 13(4). https://doi.org/10.1007/S12371-021-00629-W

Zhu, Y., Pang, X., & Zhou, C. (2022). Coupling Coordination Degree between the Socioeconomic and Eco-Environmental Benefits of Koktokay Global Geopark in China. International Journal of Environmental Research and Public Health, 19(14), 8498. https://doi.org/10.3390/ijerph19148498

Štrba, Ľ., & Palgutová, S. (2024). Geoheritage Interpretation Panels in UNESCO Global Geoparks: Recommendations and Assessment. Geoheritage, 16, 96. https://doi.org/10.1007/s12371-024-01012-1