

Digital Transformation Acceleration and Character-Based Excellent Human Resources Capacity in Fostering Sustainable Rural Economy Based on Tourism and Islamic Economics: A SLR

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Abstract

This study examined the acceleration of rural economic transformation through the integration of digital technology, human resource capacity, sustainable tourism, and Islamic economic principles. The background of this research was rooted in the persistent development gap between urban and rural areas, particularly in digital access, managerial capacity, and sustainable economic structures within village-based enterprises. The objective of this study was to synthesize existing literature to develop a comprehensive understanding of how digital transformation and character-based human resource capacity contribute to sustainable rural economic development within tourism and sharia-based frameworks. The method used was a Systematic Literature Review (SLR) following the PRISMA 2020 protocol. Data were collected from reputable databases such as Scopus, Web of Science, and Google Scholar, covering studies published between 2010 and 2025. A total of 100 selected articles were analyzed using thematic synthesis to identify patterns, relationships, and conceptual developments. The results showed that digital transformation significantly improved rural economic efficiency, particularly through the digitalization of village-owned enterprises (BUMDes) and marketing innovation. However, its effectiveness strongly depended on human resource readiness, governance quality, and digital literacy. Furthermore, sustainable tourism and Islamic economic principles were found to enhance environmental protection, ethical governance, and inclusive economic distribution. In conclusion, rural development is most effective when digitalization, human capital development, and value-based economic systems are integrated holistically. This study contributes a synthesized conceptual framework for sustainable rural transformation and provides policy implications for strengthening digital ecosystems, human capacity, and sharia-compliant rural economic models.

INTRODUCTION

Contemporary rural economic development has undergone a fundamental paradigm shift, moving from traditional sectoral approaches based on primary commodity exploitation toward spatial development models that are more holistic, inclusive, and technology-driven (Karlina et al., 2026; Rizkwanti & Kurniawan, 2025). The forces of globalization and digital disruption require rural areas not only to remain passive observers but to transform into

resilient growth centers amid macroeconomic fluctuations (Asmawa et al., 2025; Erwin et al., 2024). Within these structural changes, local institutions such as Village-Owned Enterprises (BUMDes) hold a strategic position in integrating information technology to enhance local value creation and expand rural market networks (Amali, 2026; Zainussani & Azhar, 2024). However, technology adoption in rural areas is often constrained by persistent challenges such as inadequate telecommunications infrastructure, limited financial access, and low digital literacy among communities (Santharam et al., 2025; Saputri & Hardiyan, 2025). Therefore, accelerating digital transformation must proceed in parallel with strengthening human resource capacity that is not only technically competent but also grounded in strong character and local socio-cultural values (Arif, 2021; Harianto & Listyani, 2025).

The integration of tourism, environmental preservation, and sharia economics offers a comprehensive framework for achieving Sustainable Development Goals (SDGs) at the rural level (Putra & Najib, 2026; Rizkwanti & Kurniawan, 2025). Conventional tourism models that prioritize visitor numbers often generate negative externalities, including environmental degradation, cultural commodification, and socio-economic marginalization of local communities (Dachi, 2024; Fitri et al., 2023). In contrast, community-based ecotourism guided by sharia principles emphasizes environmental stewardship (*hifz al-bi'ah*), protection of local rights, and inclusive economic justice (*'adl*) (Hakim & Azizi, 2023; Zainussani & Azhar, 2024). The rapid growth of the global halal lifestyle market, projected to reach trillions of dollars, presents significant opportunities for rural tourism areas in Indonesia to position themselves as environmentally friendly and Muslim-friendly destinations (Amira & Ferdian, 2025; Izudin et al., 2022). Translating this potential into tangible competitive advantage requires strong policy synergy supported by robust empirical evidence (Amali, 2026; Karlina et al., 2026).

Contemporary rural development is undergoing profound transformation driven by globalization, technological disruption, and shifting socio-economic structures. Traditional rural economies that were once heavily dependent on primary sectors such as agriculture and raw commodity extraction are now increasingly required to shift toward digital-based, knowledge-driven, and service-oriented models. This transformation is not merely technological but structural, requiring changes in governance systems, institutional capacity, and human resource competencies. In many developing countries, rural areas are no longer viewed as peripheral zones but as potential growth centers that can significantly contribute to national economic resilience when empowered through digital infrastructure and inclusive development strategies.

Despite this paradigm shift, global data indicate a persistent digital divide between urban and rural areas. Reports from international development institutions show that internet penetration in rural regions remains significantly lower than in urban areas, with disparities in broadband access, digital literacy, and affordability still evident across developing economies. This inequality limits rural communities' ability to participate in digital markets, access online services, and adopt smart economic systems. As a result, the benefits of the global digital economy are unevenly distributed, reinforcing structural inequality and slowing rural convergence with urban development.

In the Indonesian context, rural development faces similar structural constraints, particularly in optimizing Village-Owned Enterprises (BUMDes) as local economic drivers.

Although government programs have encouraged digital transformation in rural governance, many BUMDes still struggle with limited technological adoption, weak managerial capacity, and insufficient integration into digital ecosystems. Studies summarized in recent systematic reviews indicate that digital transformation initiatives in rural Indonesia remain at an early stage and are not yet fully supported by adequate human resource readiness and institutional maturity. This reflects a critical gap between policy intentions and implementation at the field level.

Previous empirical studies have examined various dimensions of rural transformation, including digital marketing adoption in BUMDes, financial digitization, ecotourism development, and human resource empowerment. Research by Erwin et al. (2024) and Sinarwati et al. (2023) emphasizes the role of digital platforms in improving financial transparency and marketing performance in rural contexts. Meanwhile, Karlina et al. (2026) highlight the importance of organizational capacity in supporting sustainable agribusiness development. In addition, studies on halal tourism and Islamic economics by Zainussani and Azhar (2024) and Izudin et al. (2022) underline the integration of cultural, spiritual, and economic values in rural tourism development. However, these studies tend to focus on isolated variables rather than an integrated framework.

A key research gap lies in the absence of a holistic synthesis that integrates digital transformation, human resource capacity, sustainable tourism, environmental governance, and Islamic economic principles within rural development studies. Existing literature remains fragmented across disciplines, with limited efforts to construct a unified conceptual model explaining how these dimensions interact synergistically. Furthermore, most studies emphasize technical and economic aspects while underexploring the role of character-based human resources and value-driven governance in sustaining rural digital ecosystems.

The urgency of addressing this gap is reinforced by the increasing need for resilient rural economies capable of withstanding global shocks such as pandemics, climate change, and market volatility. The Sustainable Development Goals (SDGs), particularly those related to poverty reduction, decent work, and sustainable communities, require integrated rural development approaches that combine economic, social, and environmental dimensions. Without simultaneous strengthening of digital capacity and human capital, rural areas risk exclusion from global value chains and digital economies, further widening regional inequality.

This study introduces a novel conceptual synthesis based on a systematic literature review (SLR) that integrates multidimensional frameworks of rural development. The novelty lies in linking digital transformation models with character-based human resource development and Islamic economic principles within the context of sustainable rural tourism. Unlike previous studies that examine these elements separately, this research constructs an integrative perspective that positions rural development as a system of interactions among technology, values, institutions, and sustainability.

The primary purpose of this study was to systematically analyze and synthesize existing literature on digital transformation, human resource capacity, sustainable rural economy, tourism development, and Islamic economics to develop a comprehensive conceptual framework. This framework is expected to explain how these dimensions interact and

contribute to strengthening rural economic resilience. In doing so, the study aims to provide a theoretical foundation for more integrated and applicable rural development strategies.

In terms of contribution, this research offers both theoretical and practical implications. Theoretically, it enriches the literature on rural development by proposing an integrated multidimensional model that bridges the digital economy, human capital theory, sustainability, and Islamic economic ethics. Practically, it provides insights for policymakers, local governments, and BUMDes managers in designing more effective rural transformation strategies that are not only technology-driven but also value-oriented and socially inclusive.

Finally, the objectives of this study were to identify key thematic patterns in the literature on rural digital transformation, analyze the role of human resource capacity in supporting sustainable rural economies, and construct an integrated conceptual framework for rural development. The expected benefits include improved policy formulation, enhanced BUMDes performance, stronger digital literacy in rural communities, and the development of sustainable tourism models that align economic growth with environmental preservation and socio-cultural values.

METHOD

This review used a systematic literature review (SLR) approach following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 protocol to ensure transparency, objectivity, and replicability (Asmawa et al., 2025; Rizkwanti & Kurniawan, 2025). Literature searches were conducted across reputable international databases (Scopus and Web of Science) and national databases (Sinta), covering studies published between 2010 and 2025 (Amira & Ferdian, 2025; Santharam et al., 2025). Relevant studies were identified using Boolean search strings combining key terms related to digital transformation, human resources, rural economy, sustainable development, ecotourism, and Islamic economics (Asmawa et al., 2025; Erwin et al., 2024).

The Boolean search string used across databases was as follows:

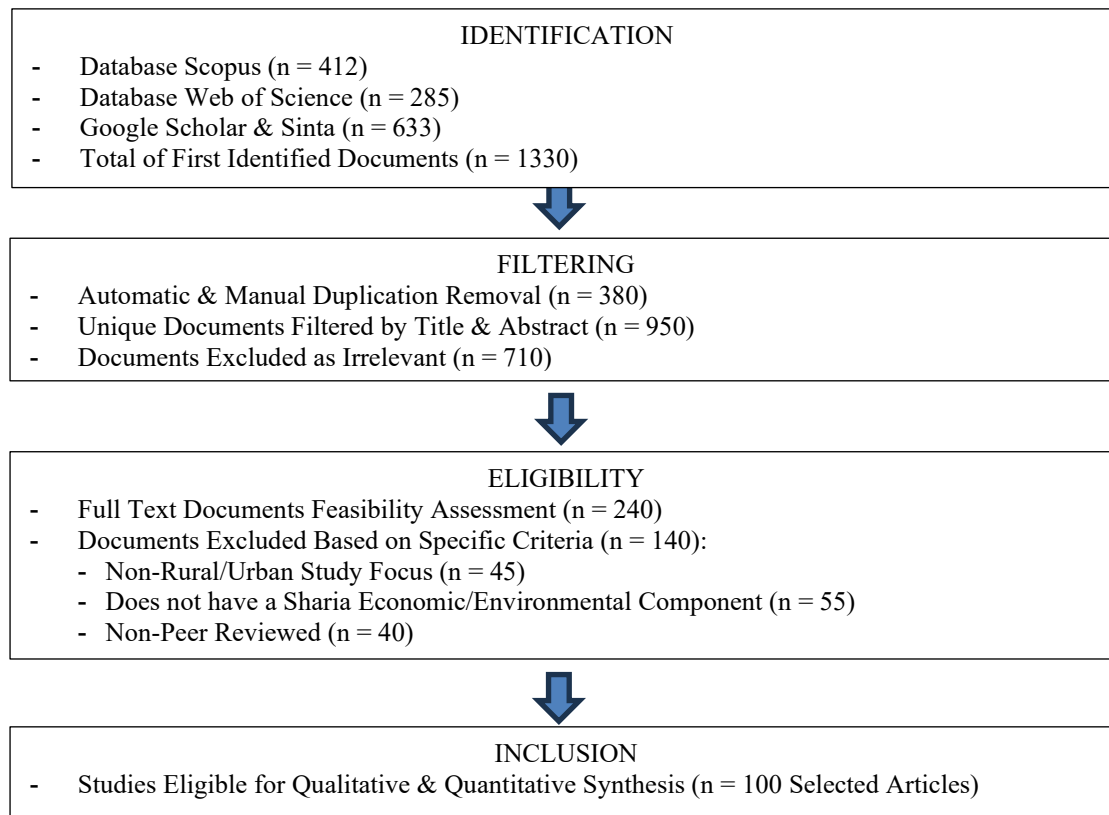
Search String = ("digital transformation" OR "digitalization" OR "smart village") AND ("human capital" OR "human resources") AND ("rural economy" OR "BUMDes" OR "village empowerment") AND ("sustainable environment" OR "ecotourism") AND ("Islamic economics" OR "halal tourism" OR "sharia").

The inclusion criteria were: (1) peer-reviewed journal articles, (2) articles written in English or Indonesian, and (3) studies focusing on the integration of digital technology, human resources, tourism, environmental sustainability, and Islamic economics in rural contexts (Rizkwanti & Kurniawan, 2025; Santharam et al., 2025). The exclusion criteria were: (1) non-scholarly publications such as opinion pieces, editorials, and book reviews, (2) articles without full-text access, and (3) studies published outside the 2010–2025 period (Karlina et al., 2026; Rizkwanti & Kurniawan, 2025).

The screening and selection process followed a structured filtering procedure; however, the calculation formula for the inclusion rate index (α) is not presented in this section.

$$\alpha = \left(\frac{N_{\text{included}}}{N_{\text{identified}}} \right) \times 100\%$$

Where *Nincluded* represents the final number of eligible articles selected for synthesis, and *Nidentified* denotes the raw number of articles retrieved in the initial keyword query (Rizkwanti & Kurniawan, 2025; Santharam et al., 2025).



1. Multi-Indicator Integration Excellent Character-Based HR Capacity

Discussions around human resource capacity in rural settings demonstrate a theoretical evolution from basic literacy enhancement toward complex multi-dimensional adaptive capabilities (Karlina et al., 2026; Saputri & Hardiyana, 2025). In the digital era, excellent human resource is defined as individuals possessing technical competencies (hard skills) such as information technology mastery, alongside character integrity (soft skills) grounded in spiritual values, honesty, and local wisdom (Arif, 2021; Indriasari et al., 2022). Integrity-driven character is proven to reduce moral hazard risks, tighten social cohesion, and improve managerial leadership effectiveness in transparently managing productive village assets (Amri et al., 2021; Safira & Taufiq, 2020).

Contemporary Rural Economic Transformation

Modern rural economic transformation relies on revitalizing local institutions like BUMDes through digital ecosystem integration (Amali, 2026; Erwin et al., 2024). Utilizing digital accounting information systems has been proven to enhance financial reporting accuracy, minimize budget leakages, and foster stakeholder trust (Nuraini & Paramitalaksmi, 2025; Sinarwati et al., 2023). However, literature emphasizes that successful economic transformation is not determined by standalone technology adoptions, but heavily influenced by organizational culture readiness, supporting regulations, and transparent financial governance accountability (Erwin et al., 2024; Safira & Taufiq, 2020).

Environmental Preservation and Sustainable Ecotourism

The green economy paradigm asserts that economic welfare improvements in rural areas must not breach ecological limits (planetary boundaries) (Putra & Najib, 2026; Santharam et al., 2025). Empirical studies confirm that Community-Based Tourism, which stresses local ownership and participatory environmental management, is highly effective in preventing productive agricultural land conversions (Dachi, 2024; Fitri et al., 2023). The application of customary institutions, such as the awig-awig concepts in Bali, demonstrates high effectiveness in regulating resource depletion and maintaining long-term rural tourism ecologies (Rama et al., 2025; Santharam et al., 2025).

Halal Tourism and Sharia Economics

Halal tourism and Sharia economics present normative-ethical dimensions that broaden the scope of sustainability from material gains to spiritual-justice balances (Amira & Ferdian, 2025; Hakim & Azizi, 2023). Utilizing Islamic social finance instruments such as Zakat, Infaq, Alms, and Waqf (ZISWAF) is proven to serve as alternative inclusive funding sources for sanitation facilities, prayer infrastructure, and halal certifications for rural MSMEs (Hasan & Zainal, 2021; Multazam et al., 2025). Halal tourism is not merely a religious label but a service quality guarantee prioritizing hygiene, hospitality, and social morality protection (Izudin et al., 2022; Zainussani & Azhar, 2024).

RESULT AND DISCUSSION

Analysis of Selected Literature based on Inclusion Criteria

The following table presents a data inventory of specific articles resulting from PRISMA's systematic screening which represent important pillars in the integration of digital transformation, human resource capacity, sustainable environment, tourism and sharia economics:

Table . Summary of Previous Studies on Digital Transformation and Halal Tourism Development

No	Author & Year	Article Title	Journal & Reputation	Main Study Focus
1	Asmawa et al. (2025)	PRISMA-based systematic review: exploring the dimensions of digital transformation	International Journal of Economics and Business Research	The main dimensions of digital transformation and critical success factors in a comprehensive manner.
2	Zainussani & Azhar (2024)	BUMDes-Based Sharia Tourism Village Development Strategy	Scientific Journal of Islamic Economics	Integration of sharia tourism, halal lifestyle, sharia accommodation, and the role of BUMDes.
3	Ahmad Izudin et al. (2022)	Developing Halal Tourism: The Case of Bongo Village, Gorontalo, Indonesia	International Journal of Religious Tourism and Pilgrimage	Collaborative model of sustainable halal tourism, ecotechnology, and integration of local wisdom.
4	Menne et al. (2023)	The Role of Sharia Economics in Realizing Economic Resilience Towards a Golden Indonesia 2045	Journal of Accounting Research	The impact of the sharia economic model on job creation and growth of tourist villages.
5	Karlina et al. (2026)	Enhancing Organizational Capacity for Sustainable Rural Development in Agribusiness	Sustainability	Local institutional organizational capacity (BUMDes) as a determinant of rural supply chain performance.

6	Sidanti et al. (2024)	Building the Village Economy through Strengthening Digital Marketing for SMEs in Tempura Village	National Community Service Journal	Digital literacy and digital marketing training for SMEs to strengthen village economic resilience.
7	Fatimah et al. (2024)	Implementation of Digital Technology in Implementing Village Development in the Era of Society 5.0	Journal of Rural and Development	Application of integrated digital technology to strengthen village administration independence and governance.
8	B. Santharam et al. (2025)	Agrotourism and rural livelihood sustainability: A systematic literature review	Phytotaxonomy	The role of agrotourism in job creation, income diversification, and preservation of village culture.
9	Rizkwanti & Kurniawan (2025)	Village Development in Indonesia: Integrated Rural Development Approach	Public Administration Scientific Journal	Systematic study of an integrated rural development approach based on the PRISMA methodology.
10	Wardhana et al. (2022)	The Role of BUMDes in Accelerating the Rural Economic Digitalization Platform	Jambura Journal of Informatics	Utilization of a special BUMDes web application to simplify the collaboration process and market access.
11	Sinarwati et al. (2023)	Digital Transformation of BUMDes Financial Management	Indonesian Journal of Business Analytics	The effectiveness of digital financial applications in increasing the accuracy and convenience of BUMDes financial reports.
12	Erwin et al. (2024)	BUMDes Digital: Revolutionizing Rural Economies Through Marketing Communication	Economic Journal	UTAUT framework for analyzing digital marketing adoption and digital literacy of BUMDes managers.
13	Ali et al. (2023)	Optimizing BUMDes in Improving the Village Economy through Creative Ideas	Amalee	Optimizing BUMDes business units for poverty alleviation and economic resilience.
14	Fitri et al. (2023)	Pasar Raya Village Mangrove Tourism Planning Towards a Mangrove Tourism Village	Journal of Sustainable Regions, Cities and Environment	Mangrove ecotourism planning based on community involvement for sustainable coastal protection.
15	Rama et al. (2025)	Optimizing the Function of Traditional Villages in Sustainable Environmental Governance in Tenganan Village	Journal of Community Service and Educational Research	Harmonization of awig-awig, the Tri Hita Karana concept, and participatory ecotourism in Balinese tradisional villages.
16	Harianto & Listyani (2025)	Empowering marginalised women in rural Indonesia: a multifaceted approach	International Journal of Sociology and Social Policy	Barriers to access to public services and economic empowerment strategies for marginalized women in villages.
17	Haryanto et al. (2023)	Green Economy implementation barriers and policy design in Indonesia	International Journal of Sustainable Development	Analysis of low-carbon emissions policies, technical financial constraints, and green economic design.
18	Dachi (2024)	Development of Sustainable Coastal Ecotourism at Sri Mersing Beach, Kuala Lama Village	Journal of Coastal Environmental Management	Analysis of community participation and empowerment based on environmental conservation in coastal destinations.
19	Multazam et al.	The Impact of Digital	International Journal	The influence of digital financial

	(2025)	Financial Inclusion on the Sustainable Finance of the SMEs Sector	of Economic, Business, Accounting, Agriculture and Sharia	inclusion moderated by the sharia banking model on the resilience of SMEs.
20	Saputri & Hardiyan (2025)	Assessment of human resource readiness to implement rural cooperative programs	International Journal of Agricultural Extension and Social Sciences	Readiness of village human resources in adopting the modern cooperative model of the Red and White Cooperative to strengthen the economy.

Source: Authors' compilation based on Scopus-indexed and peer-reviewed journals (2022–2025)

In-Depth Analysis and Case Studies Accelerating Digital Transformation

Accelerating digital transformation at the rural level has contributed significantly to operational efficiency, expanded information access, and market integration for local products (Amali, 2026; Erwin et al., 2024). Case studies of BUMDes Kuala Dua in West Kalimantan reveal that digital service adoption began with creating creative promotional wings, digital content hubs, and utilizing e-commerce marketplaces (Amali, 2026; Sinarwati et al., 2023). This tactical path successfully shortened distribution chains, increased local MSME revenues by up to 25%, and generated tech-driven job opportunities for rural youth (Amali, 2026; Sidanti et al., 2024). Digitalization also enhanced financial governance, where digital ledger applications eased BUMDes transparency reports for village fund accountability in real-time (Fatimah et al., 2024; Nuraini & Paramitalaksmi, 2025).

However, rural digital transformations still face complex structural challenges (Bahri & Ramly, 2023; Erwin et al., 2024). In remote areas of Bengkayang Regency and other border zones, infrastructure gaps, budget limitations, and low digital literacy remain primary obstacles (Santharam et al., 2025; Sidanti et al., 2024). According to the UTAUT framework, rural administrators' tech adoption intentions are highly dependent on effort expectancy and facilitating conditions (Erwin et al., 2024; Saputri & Hardiyan, 2025). Empirical findings from tourism villages in Minahasa Utara, such as Tumuluntung and Sawangan, reinforce this thesis, showing that standalone BUMDes digitalization does not yield significant economic impacts unless supported by organizational readiness, transparent management, and skilled human resources (Karlina et al., 2026; Nuraini & Paramitalaksmi, 2025).

Strengthening HR Capacity

Human capacity acts as the ultimate pillar determining the success and sustainability of rural programs (Harianto & Listyani, 2025; Jufri, 2019). Empirical cases from transmigration settlements show that agribusiness supply chain failures often stem from organizational bottlenecks within BUMDes, cooperatives, and farmer groups (Karlina et al., 2026; Saputri & Hardiyan, 2025). Weak managerial skills, poor agency coordination, and absent crop aggregation mechanisms weaken local farmers' bargaining positions, leading to high middleman dependency, high logistics costs, and lack of processing value-add (Karlina et al., 2026; Santharam et al., 2025). Holistic capacity models must integrate individual skill updates, institutional governance reforms, multi-stakeholder network expansions, and applied tech installations (Harianto & Listyani, 2025; Jufri, 2019).

Empowering rural human resources must also apply participatory models that invoke critical consciousness (conscientization), community organizing, and resource delivery (Amri et al., 2021; Saputri & Hardiyani, 2025). The Red and White Cooperative initiative launched by the government serves as a strategic tool to train financial self-reliance (Saputri & Hardiyani, 2025; Zainussani & Azhar, 2024). Local readiness to adopt this modern cooperative framework is heavily influenced by formal education, regular management workshops, and deep collective mutual-aid values (Harianto & Listyani, 2025; Saputri & Hardiyani, 2025). Without continuous mentoring, local initiatives remain vulnerable to failure due to administrative incapacity (Amri et al., 2021; Karlina et al., 2026).

Sustainable Tourism

Sustainable rural tourism hinges on the community's capacity to package natural views, cultural heritages, and unique lifestyles without degrading ecological assets (Dachi, 2024; Santharam et al., 2025). Successful Community-Based Rural Tourism (CBRT) relies heavily on social capital, visible through active social networks, accepted social norms, and mutual social trust (Dachi, 2024; Zainussani & Azhar, 2024). In Bangelan (Malang) and Sempu (Kediri), strong social capital was successfully steered into managing ecotourism, tea plantations, and local livestock farms, offering direct cash impacts to villagers (Hermawati, 2020; Santharam et al., 2025). In Sempu, the engagement of over 300 residents across various tourist jobs under BUMDes coordination significantly curbed youth urban migration (Hermawati, 2020; Zainussani & Azhar, 2024).

Nevertheless, uncontrolled rural tourism growth can spark land-use conflicts and ecological depletions (Rama et al., 2025; Santharam et al., 2025). For instance, reservoir-based water tourism in Kedung Ombo faces tough trade-offs between dam ecological protection, business scaling, and fragmented bureaucratic decisions (Karlina et al., 2026; Rizkwanti & Kurniawan, 2025). To resolve such complexities, traditional villages like Tenganan Pegringsingan in Karangasem, Bali, deploy community-led ecology management by embedding Tri Hita Karana values into written customary laws (awig-awig) (Rama et al., 2025; Santharam et al., 2025). These codes ban chemical inputs in village farming, restrict forest logging, and mandate zero-plastic waste habits (Rama et al., 2025; Santharam et al., 2025).

Islamic Economics

Embedding Sharia economic frameworks in rural development provides a moral muamalah blueprint that balances material gains with spiritual-social equity (Amira & Ferdian, 2025; Hakim & Azizi, 2023). At the Green Garden agrotourism in Magetan, East Java, Sharia ethics are blended with circular green principles (Putra & Najib, 2026; Zainussani & Azhar, 2024). Ecotourism managers apply *hifz al-bi'ah* (environmental preservation) by recycling leaf litter and livestock manure into natural organic compost, successfully reducing chemical fertilizer reliance by 40% (Putra & Najib, 2026; Zainussani & Azhar, 2024). Under the principles of distributive justice ('*adl*) and partnership (*musyarakah*), BUMDes enforce a transparent profit-sharing model where 70% of parking fees flow directly to the village treasury to fund social aids for impoverished groups (Putra & Najib, 2026; Zainussani & Azhar, 2024).

Halal tourism in Bongo, Gorontalo, showcases how Islamic heritages can be converted into unique destination branding (Izudin et al., 2022; Zainussani & Azhar, 2024). By

constructing the iconic "Golden Walima Mosque" on a 250-meter-high cliff overlooking the ocean, Bongo offers deep spiritual journeys while keeping the traditional Walima festival alive (Izudin et al., 2022; Zainussani & Azhar, 2024). The site also incorporates organic laboratories at Pesantren Alam that apply traditional zero-chemical farming methods (Izudin et al., 2022; Putra & Najib, 2026). In terms of financial resilience, research in Lhokseumawe shows that digital financial inclusion moderated by Sharia banking service models significantly protects local tourist MSMEs against market shocks (Multazam et al., 2025; Zainussani & Azhar, 2024).

Comparative Table Analysis Discussion.

The following table is a visualization of the key articles underlying the in-depth analysis:

Table 2. Comparative Analysis of Digital Transformation and Halal Tourism Studies

No	Author & Year	Article Title	Dimensions	Main Finding & Solutions
1	Zainussani & Azhar (2024)	BUMDes-Based Sharia Tourism Village Development Strategy	Sharia Economics & BUMDes	Halal lifestyle integration patterns, sharia accommodation, and the role of BUMDes in NTB.
2	Ahmad Izudin et al. (2022)	Developing Halal Tourism: The Case of Bongo Village	Sustainable & Halal Tourism	Walima Emas Mosque, Walima local wisdom, and the Pesantren Alam laboratory.
3	Divanda Putra & Najib (2026)	Green Economy Transformation in Rural Agrotourism	Environment & Sharia	40% reduction in chemical fertilizers through circular organic fertilizer at Green Garden Magetan.
4	Lanto Amali (2026)	Digital Transformation for Rural Empowerment	Digital Transformation	BUMDes web application framework for supply chain optimization and digital marketing.
5	Erwin et al. (2024)	BUMDes Digital: Revolutionizing Rural Economies	Digital Marketing	UTAUT analysis on the adoption of digital marketing literacy in West Bangka BUMDes.
6	Sinarwati et al. (2023)	Digital Transformation of BUMDes Financial Management	Digital Transformation	Digital accounting reporting applications minimize human error in reporting funds.
7	Grace Dachi (2024)	Development of Sustainable Coastal Ecotourism	Sustainable Tourism	Participation of coastal residents in planting the green belt of Sri Mersing Beach mangrove forests.
8	Bagus Ari Rama et al. (2025)	Optimizing the Function of Traditional Villages in Environmental Governance	Sustainable Environment	Implementation of the awig-awig and Tri Hita Karana customary laws in Tenganan Village, Bali.
9	Harianto & Listyani (2025)	Empowering marginalised women in rural Indonesia	HR capacity	Empowering marginal women heads of farming households through financial literacy.
10	Nina Karlina et al. (2026)	Enhancing Organizational Capacity for Rural Development	HR capacity	Organizational capacity as the main determinant of the efficiency of transmigration agribusiness.
11	Zainussani & Azhar (2024)	BUMDes-Based Sharia Tourism Village Development Strategy	Sharia Economics & BUMDes	Halal lifestyle integration patterns, sharia accomodation, and the role of BUMDes in NTB.

Source: Authors' compilation based on Scopus-indexed journals, international peer-reviewed articles, and systematic literature review studies (2022–2025)

Recommendations

Accelerating Telematics Infrastructure in Rural Blank Spots

First-priority policies must focus on resolving connectivity issues by providing free broadband internet in rural economic clusters such as BUMDes centers, cooperatives, and tourism homestay blocks (Bahri & Ramly, 2023; Fatimah et al., 2024). The Ministry of

Villages and the Ministry of Communication and Informatics must initiate incentive packages for private operators to deploy mini BTS towers via Public-Private Partnerships (Karlina et al., 2026; Rizkwanti & Kurniawan, 2025). Physical installations must be paired with village data hubs to integrate local potentials, demography, and BUMDes financial ledgers digitally (Fatimah et al., 2024; Nuraini & Paramitalaksmi, 2025).

Sharia-Digital Training Integration in Vocational Centers

To bridge the competence gap, governments must design "Tech-Agile Village Official" curricula to be taught in vocational training centers (Amri et al., 2021; Jufri, 2019). The course should combine technical skills (e-commerce, content creation, SEO) with Islamic business ethics such as trustworthiness (*amanah*), equity (*'adl*), and transparent communication (Indriasari et al., 2022; Zainussani & Azhar, 2024). Regional authorities must mandate digital certifications as eligibility criteria for appointing BUMDes directors or cooperative managers (Amri et al., 2021; Karlina et al., 2026).

Green Halal Certification

The Ministry of Tourism and Creative Economy, together with the Indonesian Ulema Council, must launch standardized Green-Halal Destination blueprints (Amira & Ferdian, 2025; Hakim & Azizi, 2023). The certification must integrate Muslim-friendly facilities with ecological compliance, including single-use plastic ban, water recycling, and organic waste separation (Putra & Najib, 2026; Zainussani & Azhar, 2024). Financial incentives and free halal certification tracks for rural MSMEs must be prioritized to elevate local tourism competitiveness (Multazam et al., 2025; Zainussani & Azhar, 2024).

Sukuk Waqf and Peer-to-Peer Sharia Financing

KNEKS and OJK should construct "Productive Village Sukuk Waqf" structures to pool public waqf funds for basic tourism infrastructure projects (Hasan & Zainal, 2021; Multazam et al., 2025). BUMDes are instructed to avoid commercial interest-bearing debts, transitioning to sharia-compliant *mudharabah* or *musyarakah* models with villagers as primary shareholders (Putra & Najib, 2026; Zainussani & Azhar, 2024). This framework minimizes insolvency risks, retains social capital, and guarantees fairer wealth distribution (Dachi, 2024; Hasan & Zainal, 2021).

CONCLUSION

This study confirmed that the success of rural economic development in the digital era is strongly influenced by the synchronization between advanced information systems and the ethical-managerial character of local human resources (Amali, 2026; Sinarwati et al., 2023). Technology functions primarily as an enabling tool, while the main drivers of sustainable economic welfare (*falah*) and environmental stewardship (*hifz al-bi'ah*) are organizational readiness, accounting transparency, transformational leadership, and compliance with sharia-based ethical principles (Karlina et al., 2026; Putra & Najib, 2026). Effective Pentahelix collaboration across stakeholders is expected to produce resilient, environmentally sustainable, and value-oriented rural development outcomes (Harianto & Listyani, 2025; Rizkwanti & Kurniawan, 2025).

Although this systematic review provides broad insights, three key research gaps were identified for future empirical studies. First, the impact of artificial intelligence (AI) recommendation algorithms on Muslim traveler loyalty in halal tourism villages requires

further investigation. Future studies may apply Structural Equation Modeling (SEM) to examine how AI-driven reservation platforms influence tourist satisfaction and revisit intention in rural destinations (Hakim & Azizi, 2023; Zainussani & Azhar, 2024). Second, the role of sharia-based peer-to-peer (P2P) fintech funding in promoting green agriculture remains underexplored. Longitudinal studies are needed to assess how digital Islamic financial inclusion affects farmers' adoption of circular agriculture practices, including organic composting and soil conservation (Multazam et al., 2025; Putra & Najib, 2026). Third, the role of social capital and technological leadership in bridging the digital divide in border regions requires further qualitative comparative research, particularly in examining how local customary leaders facilitate technology adoption and digital knowledge transfer among marginalized communities (Harianto & Listyani, 2025; Karlina et al., 2026).

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