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The Future of Sustainable Tourism Research in Pekalongan Municipality: A Scoping Review and Its Education Perspective

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ABSTRACT

Sustainable tourism is essential for supporting economic development, cultural preservation, and environmental responsibility. Although various Indonesian cities have embraced sustainable tourism, Pekalongan Municipality—known for its batik industry and recognized as a UNESCO Creative City—remains underexplored in this context because existing research focuses mainly on creative industries and urban development. This study aims to map the academic landscape of tourism research in Pekalongan and identify gaps in sustainability discourse. Employing a scoping review method, data were collected using Publish or Perish software from Google Scholar, yielding 1000 publications between 2015 and 2024. After rigorous filtering, only 36 studies directly addressed tourism in Pekalongan. Results show that while some tourism research exists, sustainability aspects like environmental conservation, community participation, and tourism education are limited. These findings emphasize the need for interdisciplinary and educational research to integrate economic, socio-cultural, and environmental dimensions. This study provides a foundation for future research and informs policymakers to develop comprehensive sustainable tourism strategies for Pekalongan.

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1. INTRODUCTION

Tourism plays a crucial role in fostering economic growth, preserving cultural heritage, and enhancing local livelihoods (Ha *et al.*, 2024; Li *et al.*, 2024). Globally, sustainable tourism development has been emphasized as a way to balance economic benefits with environmental and socio-cultural considerations (Gupta *et al.*, 2024). In Indonesia, tourism is recognized as a strategic sector, with various regions actively promoting their unique attractions (Fadli *et al.*, 2022). However, the degree to which tourism development aligns with sustainability principles varies widely among municipalities (Muhamad *et al.*, 2025; Suparjo *et al.*, 2024). While popular destinations such as Bali and Yogyakarta have adopted sustainable tourism initiatives, many other cities remain underexplored in terms of tourism potential and sustainability strategies. Furthermore, tourism education as a means to support sustainable tourism practices is often overlooked in emerging destinations.

Pekalongan Municipality, located on the northern coast of Central Java, is predominantly known for its batik industry (Budiarto *et al.*, 2024; Suparno *et al.*, 2019), which has been recognized as an Intangible Cultural Heritage by UNESCO (Steelyana, 2012). Since joining the UNESCO Creative Cities Network in the Crafts and Folk Art category in 2014 (Syahidah, 2022), Pekalongan has highlighted its rich cultural assets, but tourism development has not been the central focus of either economic policies or academic studies. Research concerning Pekalongan has mostly revolved around batik production, creative industries, cultural heritage, and urban development, with limited attention to tourism and sustainability issues (Budiarto *et al.*, 2024; Hayati, 2012; Mahfudloh & Lestari, 2017; Suyani, 2013; Syahidah, 2022). This raises concerns about whether tourism is being developed in a structured and sustainable manner and how tourism education could support such development.

A systematic understanding of how tourism is positioned in academic research on Pekalongan is essential to identify dominant themes and research gaps. Although several studies touch upon aspects related to tourism—such as cultural heritage, creative economies, and urban planning—there is a lack of comprehensive analysis regarding how these aspects contribute to sustainable tourism. This absence reflects a broader gap in integrating critical dimensions like environmental conservation, community involvement, and long-term socio-economic resilience into tourism discourse (Kawuryan *et al.*, 2022). Furthermore, the role of education, particularly tourism education, in preparing local communities, students, and policymakers to adopt sustainable tourism practices remains underexplored.

This study aims to map the current research landscape concerning tourism in Pekalongan Municipality through a scoping review methodology (Mak & Thomas, 2022). By systematically reviewing academic works, this research seeks to answer: (1) What are the dominant research themes related to Pekalongan that intersect with tourism? (2) To what extent has sustainable tourism been addressed in these studies? (3) What are the research gaps concerning tourism and sustainability in Pekalongan? Addressing these questions will provide valuable insights into the current state of knowledge and help guide future research and policy directions.

In addition to answering these research questions, this study has three core objectives. First, it aims to identify and classify tourism-related research in Pekalongan while evaluating how sustainability principles are integrated. Second, it assesses how various academic disciplines, including tourism education and related educational fields, approach tourism topics and how education can serve as a tool for fostering sustainable tourism. Third, it highlights existing gaps and proposes future research directions to promote tourism that supports environmental, cultural, and economic sustainability. These objectives align with

broader efforts to integrate research and education as a foundation for evidence-based tourism development in Pekalongan.

Conducting this scoping review is crucial because it will offer a comprehensive overview of existing research trends and link tourism studies with broader socio-economic and educational research concerning Pekalongan (Khalil *et al.*, 2025; Pollock *et al.*, 2024). Although individual studies may focus on aspects like economic growth, cultural identity, or city planning, their connection to sustainable tourism and the role of education in supporting this vision is often implicit. By systematically analyzing available literature, this study seeks to bridge gaps between tourism research and broader academic discourse while highlighting how education—particularly tourism education—can be a driver of sustainable tourism development.

The findings of this study benefit academics, policymakers, educators, and local stakeholders working to strengthen sustainable tourism strategies in Pekalongan Municipality. By identifying both the strengths and gaps in existing literature, this research supports more targeted and structured tourism initiatives that can foster long-term economic, environmental, and social well-being. Additionally, this study emphasizes the essential role of tourism education in developing future professionals and informed citizens capable of advancing sustainable tourism, thereby encouraging educational institutions to integrate sustainability principles into their curricula and research agendas.

2. METHODS

This study employed a scoping review approach to explore sustainable tourism in Pekalongan Municipality, focusing on its relevance to educational development, local policy, and tourism management. A scoping review is a systematic method used to map key concepts, identify research gaps, and summarize evidence within a broad and diverse field of study, particularly when the objective is to understand evolving issues and interdisciplinary approaches (Campbell *et al.*, 2023; Nyanchoka *et al.*, 2019). Unlike systematic reviews that aim to assess the quality of evidence, scoping reviews seek to provide an overview of the existing body of knowledge and emerging trends, thus contributing to both research and educational discourse on tourism and sustainability.

This study followed the five-step framework outlined by Mak and Thomas (2022) for conducting a structured and transparent scoping review (Figure 1). This model offers a clear methodology that is suitable for academic research and for generating knowledge that supports educational programs on sustainable tourism and urban planning.

Relevant scholarly sources were gathered using Publish or Perish (PoP) software, which extracted data from Google Scholar. Publish or Perish is a widely used academic search and citation analysis tool that compiles bibliographic data from sources such as Google Scholar, CrossRef, and Scopus. It enables researchers and educators to identify relevant literature, assess citation metrics, and filter search results based on specific parameters, supporting both research and teaching purposes in higher education.

The search was conducted using Google Scholar as the main database within Publish or Perish, and specific criteria were applied to ensure the inclusion of diverse and relevant scholarly works. The keywords used were “Pekalongan,” with a publication range of 2015–2024 (covering the last ten years to reflect contemporary issues), including sources published in both English and Indonesian. The source types considered were journal articles, conference papers, academic books, and theses, ensuring a wide-ranging exploration of academic perspectives.

The initial search yielded 1000 entries, including 908 journal articles and 92 non-journal sources such as student theses, academic books, and research reports. After a preliminary review of titles and abstracts, 584 articles (64.32%) were identified as directly related to research conducted in Pekalongan Municipality. However, it became evident that only a limited number of these studies specifically addressed tourism. Many articles explored topics like urban planning, creative industries, environmental studies, and economic development, which intersect with tourism but do not focus on it as a primary subject.

To ensure that only tourism-related studies were included—essential for contributing to tourism education, research, and policy-making—a rigorous multi-step filtering process was applied. First, 291 articles (32.05%) focusing on Kabupaten Pekalongan or those failing to specify whether they addressed the municipality or regency were excluded to maintain focus on Pekalongan Municipality. Second, 9 articles (0.99%) using the outdated term Karesidenan Pekalongan, a Dutch colonial-era designation, were excluded for lack of contemporary relevance to tourism development. Third, 17 articles (1.87%) referring to other locations named Pekalongan, such as Kecamatan Pekalongan in Kabupaten Lampung Timur or Desa Pekalongan in Kabupaten Pati, were removed to avoid geographic misalignment. Fourth, 7 articles (0.77%) mentioning Pekalongan only in passing—such as an author's institutional affiliation or as a plant name variant—were also excluded.

After this comprehensive filtering, 36 articles were identified as directly related to tourism research in Pekalongan Municipality. These articles constitute the core dataset for this scoping review and serve as a foundation for understanding tourism development challenges, opportunities, and educational needs in the municipality. The final dataset reflects a body of knowledge that can inform educational curriculum development, tourism management training, and policymaking related to sustainable tourism in Pekalongan.

Figure 1 presents a step-by-step summary of the scoping review process, following [Mak and Thomas \(2022\)](#), and illustrates how this review was systematically and educationally structured to ensure relevance, accuracy, and comprehensive coverage of tourism-related studies in Pekalongan Municipality.

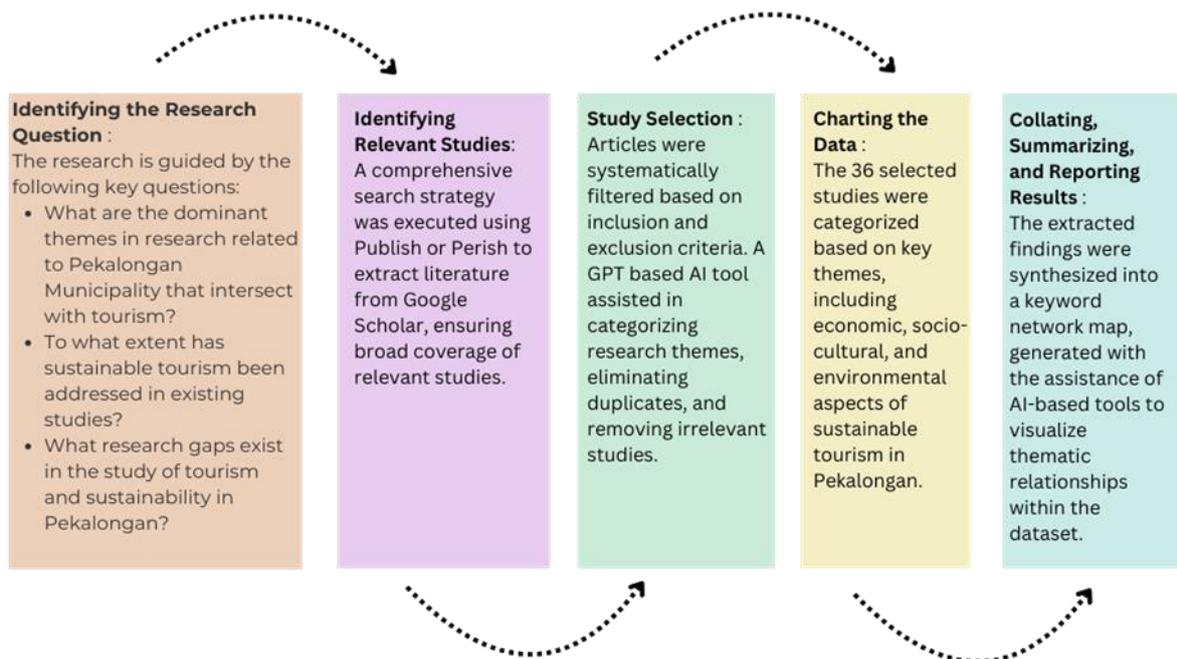


Figure 1. Step-by-step process of scoping review based on [Mak and Thomas \(2022\)](#).

3. RESULTS AND DISCUSSION

3.1. Overview of Selected Studies

A total of 36 articles were identified as directly related to tourism in Pekalongan Municipality after filtering 1000 initial entries retrieved from Google Scholar using Publish or Perish. These studies encompass various aspects of tourism, including cultural heritage, economic development, city branding, hospitality, and sustainability. **Table 1** contains the list of all 36 articles used in this study in English and Bahasa Indonesia.

Table 1. Articles directly related to tourism in Pekalongan municipality.

No	Title	Year	No	Title	Year
1	<i>Strategi Kota Pekalongan Dalam Pengembangan Wisata Kreatif Berbasis Industri Batik</i>	2015	19	<i>Pengaruh Job Competency dan Emotional Intelligence Terhadap Employee Performance Melalui Organizational Citizenship Behavior (Studi Pada Karyawan Hotel Horison Pekalongan)</i>	2021
2	<i>Pengaruh Pemberian Kompensasi Terhadap Kinerja Karyawan Hotel Dafam Kota Pekalongan</i>	2020	20	<i>Pengaruh Kepemimpinan Dan Komunikasi Terhadap Kinerja Karyawan Di Hotel Nirwana Pekalongan</i>	2022
3	<i>Pengembangan Ekonomi Kreatif Batik Tulis Kota Pekalongan Sebagai Upaya Pelestarian Budaya Dan Peningkatan Pendapatan Masyarakat</i>	2020	21	<i>Analisis Perubahan Zona Nilai Tanah Akibat Keberadaan Lokasi Wisata Tahun 2016-2019 Di Kecamatan Pekalongan Utara Kota Pekalongan (Studi Kasus : Kecamatan Pekalongan Utara)</i>	2020
4	<i>Pengaruh Citra Perusahaan Dan Kualitas Pelayanan Terhadap Kepuasan Pelanggan Untuk Membangun Minat Berkunjung Kembali : Studi Pada Hotel X Kota Pekalongan</i>	2020	22	<i>Eksistensi Batik Encim Dalam Arena Produksi Kultural Di Pekalongan</i>	2021
5	<i>Pekalongan Sebagai Kota Wisata Halal: Pandangan Para Akademisi</i>	2020	23	<i>Dampak Ekonomi Dan Sosial Pada Tradisi Syawalan Di Kelurahan Krpyak Kota Pekalongan</i>	2020
6	<i>Pelestarian Budaya Batik Nusantara Sebagai Identitas Kultural Melalui Pameran Di Museum Batik Pekalongan Pada Masa Covid-19</i>	2021	24	<i>How To Develop Kampung Wisata Batik Pesindon As A Tourist Destination In Pekalongan Through Swot Analysis</i>	2018
7	<i>Strategi City Branding Pekalongan "World's City Of Batik"</i>	2018	25	<i>Habitus Masyarakat Krpyak Kidul Kota Pekalongan Terkait Tradisi Lopis Raksasa</i>	2022
8	<i>Aplikasi Pgrouting Untuk Penentuan Rute Alternatif Menuju Wisata Batik Di Kota Pekalongan Berbasis Webgis</i>	2018	26	<i>Translating The Unique Folklore Of Giant Lopis Feast And Giant Cone Megono In Pekalongan Syawalan Traditions</i>	2019
9	<i>Strategi Pengembangan Batik Berbasis Ekonomi Kreatif Kampung Batik Kauman Pekalongan</i>	2020	27	<i>Building A PLS Pathway Model: A Multivariate Approach Innovative Marketing Strategies Facing The Covid-19 Pandemic-Case Study Of The Hotel Santika Pekalongan</i>	2021

Table 1 (continue). Articles directly related to tourism in Pekalongan municipality.

No	Title	Year	No	Title	Year
10	The Determinant Factors Of Development Batik Cluster Business: Lesson From Pekalongan, Indonesia	2019	28	<i>Perlindungan Hak Cipta Atas Motif Batik Buketan Sebagai Warisan Budaya Di Pekalongan (Studi Terhadap Karya Seni Batik Tradisional Pekalongan)</i>	2018
11	<i>Analisis SWOT Sebagai Pengembangan Umkm Berbasis Ekonomi Kreatif Destinasi Pariwisata Batik Kota Pekalongan</i>	2019	29	<i>Strategi Pengembangan Ekowisata Di Pusat Informasi Mangrove (PIM) Kelurahan Kandang Panjang Pekalongan</i>	2018
12	<i>Analisis Potensi Dan Strategi Pengembangan Objek Wisata Pantai Pasir Kencana Kota Pekalongan</i>	2019	30	The Contribution Of Culinary On Halal Tourism: Case Study Of Pekalongan City, Central Java, Indonesia	2022
13	<i>Strategi Komunikasi City Branding Pemerintah Kota Pekalongan Dalam Mempromosikan World's City Of Batik</i>	2020	31	Public Perceptions Of Halal Tourism Infrastructure In Pekalongan, Central Jawa	2022
14	A Projection Of Halal Tourism: A Case Study Of Pekalongan City, Indonesia	2020	32	<i>Pengaruh Motivasi Dan Disiplin Kerja Terhadap Kinerja Karyawan Di Hotel Pesonna Pekalongan</i>	2021
15	<i>Dampak Pembangunan Jalan Tol Terhadap Faktor Sosial, Ekonomi Dan Lingkungan Pada Usaha Batik Dan Perhotelan Di Kota Pekalongan</i>	2019	33	<i>Pengembangan Buku Pop-Up Kuliner Sebagai Upaya Promosi Wisata Kuliner Kota Pekalongan</i>	2019
16	Sustainable Development Goals (SDGs) And The Emergence Of Creative Cities In Indonesia: Comparative Studies From Pekalongan, Yogyakarta, And Surakarta During The Covid-19 Pandemic	2022	34	Pekalongan, The World's City Of Batik, Embraces Plurality Through Cultural Events With Religious Background	2024
17	<i>Strategi Adaptasi Umkm Kuliner Pada Masa Pandemi COVID-19 (Studi Kasus: Rumah Makan Haji Masduki, Pekalongan)</i>	2022	35	<i>Eksistensi Pedagang Batik Di Wisata Religi Desa Sapuro Kebulen Kota Pekalongan (Studi Di Kawasan Makam Al-Habib Ahmad Bin Abdullah Bin Thalib Alatas)</i>	2023
18	<i>Tradisi Lopis Raksasa Dalam Perspektif Kerukunan Umat Beragama Di Kota Pekalongan</i>	2016	36	The Religious Values Existence On Pekalongan Batik Cultural Heritage	2024

3.2. Keyword Analysis and Network Mapping

To determine the dominant themes in tourism research on Pekalongan Municipality, a keyword frequency analysis was conducted. The most frequently occurring keywords were identified from the 36 article files used in this study. **Table 2** displays the percentage of occurrence of the most prominent keywords in the papers.

Table 2. Keyword Occurrence in Tourism Research on Pekalongan Municipality

Keyword / Theme	Occurrences	Percentage
Batik (Cultural Heritage)	2775	31%
Tourism	1782	20%
Economic (Development)	721	8%
Cultural Heritage	678	8%
Creative Economy	616	7%
Halal Tourism	507	6%
Government (Support/Policy)	468	5%
Hospitality (Hotels)	450	5%
Tourism Infrastructure	327	4%
City Branding	247	3%
Culinary Tourism	241	3%
Ecotourism	94	1%
Sustainability	74	1%

The findings indicate that Batik and Cultural Heritage (31%) dominate research discussions, while sustainability-related topics (1%) are significantly underrepresented. After extracting important keywords from the papers, a clustered keyword network map was created using Natural Language Processing (NLP) and network analysis tools. This map visualizes the connections between recurring keywords and identifies thematic relationships within the literature. **Figure 2** illustrates the correlation between themes in the papers.

These results highlight a research imbalance, where discussions on Pekalongan's tourism remain predominantly focused on Batik and cultural heritage, while other crucial aspects such as sustainability, ecotourism, and infrastructure receive minimal attention. The low percentage of sustainability-related themes (1%) suggests that sustainable tourism has not yet been widely integrated into tourism research in the region. Similarly, ecotourism and city branding appear marginal, despite their potential in diversifying Pekalongan's tourism offerings. This gap underscores the need for future research to explore a more holistic approach to tourism development, incorporating environmental sustainability, infrastructure improvements, and digital transformation to ensure long-term growth.

The Clustered Keyword Network Map for Tourism Research in Pekalongan illustrates the thematic structure of existing studies in the region. The network is centered around key themes such as Tourism, Batik, Economy, and Sustainability, with notable clusters reflecting different research focuses:

- (i) The red cluster (Pekalongan) serves as the central node, linking multiple themes. The blue cluster (Cultural aspects: Batik, Culture, Community) highlights the strong emphasis on cultural heritage tourism, particularly through Batik.
- (ii) The green cluster (Tourism-related themes: Tourism, Attraction, Destination, Branding, Tourism) underscores the interest in destination marketing and tourism promotion. The orange cluster (Economic aspects: Development, Strategy, Economy, Business, Industry) suggests that economic growth and business development are integral to tourism discussions.

The purple cluster (Infrastructure: Hotel, Sustainability) is less connected, indicating that sustainability and infrastructure development remain underexplored in Pekalongan's tourism research.

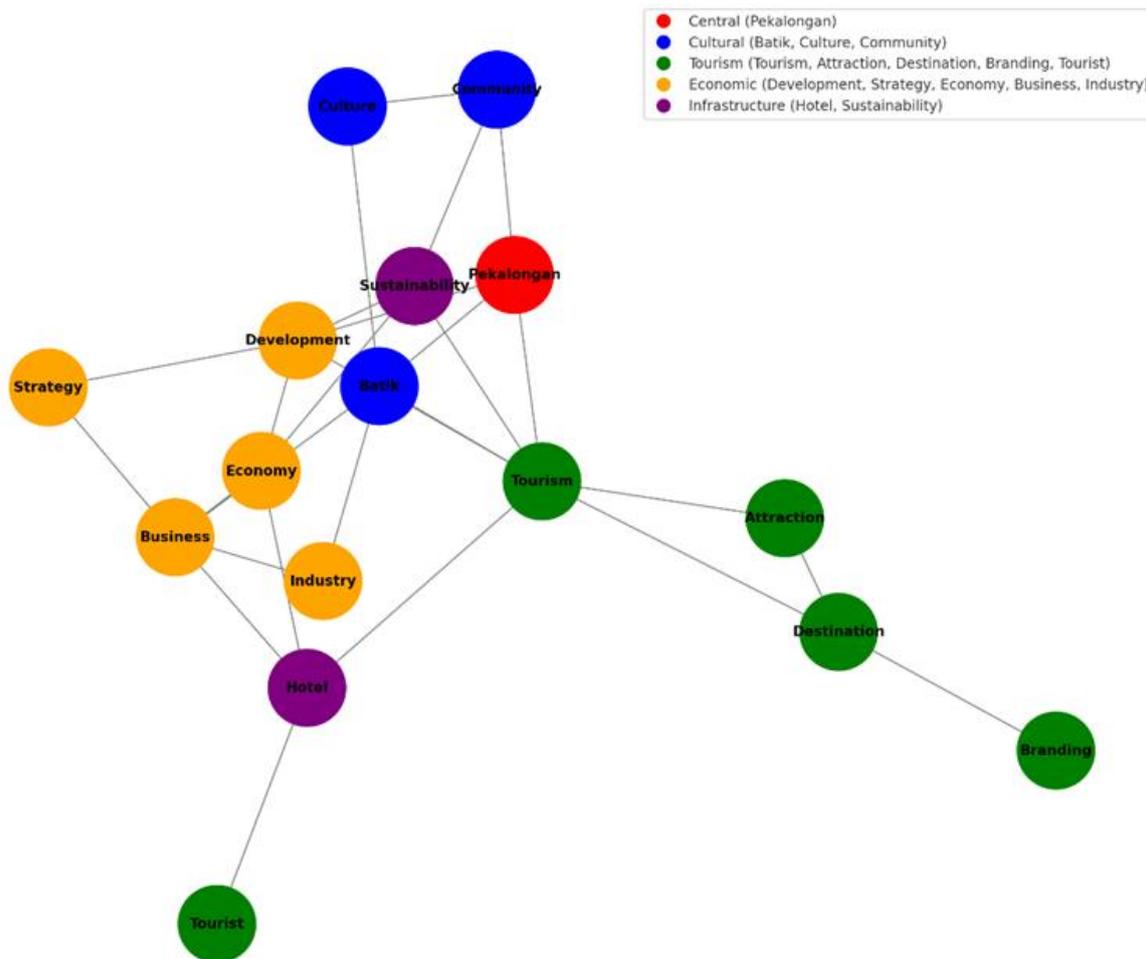


Figure 2. Clustered keyword network map of research in Pekalongan municipality.

3.3. Summary of Previous Research

The selection of the 20 articles from the total of 36 for display in the context of sustainable tourism in Pekalongan municipality was primarily driven by their relevance to key themes of sustainable tourism, such as cultural preservation, economic development, and community engagement (**Table 3**). Articles that explored the development of the batik industry, halal tourism, and creative tourism strategies were prioritized, as they directly contribute to the sustainable tourism framework by promoting local culture and heritage while enhancing the economic well-being of the community. Additionally, studies that addressed the impact of tourism on local identity and the environment were included to ensure a comprehensive understanding of sustainable practices in the region.

Furthermore, the chosen articles reflect a balance between qualitative and quantitative research methodologies, providing a well-rounded perspective on the challenges and opportunities within Pekalongan's tourism sector. By focusing on studies that analyze the effectiveness of city branding, SWOT analyses, and the role of local traditions in tourism, the selected articles collectively offer valuable insights into how Pekalongan can position itself as a sustainable tourism destination. This selection not only highlights the importance of integrating cultural and economic factors but also emphasizes the need for strategic planning and community involvement in fostering a sustainable tourism environment.

Table 3. Previous research related to sustainable tourism.

No.	Title	Author	Year	Methodology	Findings
1	<i>Strategi Kota Pekalongan Dalam Pengembangan Wisata Kreatif Berbasis Industri Batik</i>	(Damayanti & Latifah, 2015)	2015	Qualitative	Identified strategies for developing creative tourism based on the batik industry, emphasizing community involvement.
2	<i>Pengembangan Ekonomi Kreatif Batik Tulis Kota Pekalongan Sebagai Upaya Pelestarian Budaya Dan Peningkatan Pendapatan Masyarakat</i>	(Rosyada & Tamamudin, 2020)	2020	Qualitative	Discussed challenges faced by the batik industry and the need for community empowerment and government support.
3	<i>Pekalongan Sebagai Kota Wisata Halal: Pandangan Para Akademisi</i>	(Ismanto & Madusari, 2020)	2020	Qualitative	The consensus among academics on developing Pekalongan as a halal tourism destination, with recommendations for infrastructure improvement.
4	<i>Pelestarian Budaya Batik Nusantara Sebagai Identitas Kultural Melalui Pameran di Museum Batik Pekalongan Pada Masa COVID-19</i>	(Larasati, 2021)	2021	Qualitative	Highlighted the role of exhibitions in preserving batik culture during the pandemic, emphasizing community engagement.
5	<i>Strategi City Branding Pekalongan "World's City of Batik"</i>	(Susanti, 2018)	2018	Qualitative	Proposed branding strategies to promote Pekalongan as the "World's City of Batik," focusing on cultural identity.
6	<i>Aplikasi Pgrouting Untuk Penentuan Rute Alternatif Menuju Wisata Batik di Kota Pekalongan Berbasis Webgis</i>	(Aminullah et al., 2018)	2018	Quantitative	Developed a WebGIS application for optimizing routes to batik tourism sites, enhancing user experience and accessibility.
7	<i>Strategi Pengembangan Batik Berbasis Ekonomi Kreatif Kampung Batik Kauman Pekalongan</i>	(Listiyaningrum et al., 2020)	2020	Qualitative	Identified key factors influencing the development of batik clusters, emphasizing the importance of business conditions and government roles.
8	<i>The Determinant Factors of Development Batik Cluster Business: Lesson from Pekalongan, Indonesia</i>	(Suparno et al., 2019)	2019	Quantitative	Analyzed factors affecting batik cluster development, finding positive relationships between business conditions and cluster growth.

Table 3 (continue). Previous research related to sustainable tourism.

No.	Title	Author	Year	Methodology	Findings
9	<i>Analisis SWOT Sebagai Pengembangan Umkm Berbasis Ekonomi Kreatif Destinasi Pariwisata Batik Kota Pekalongan</i>	(Sunarjo et al., 2019)	2019	Qualitative	Conducted a SWOT analysis, identifying strengths, weaknesses, opportunities, and threats for the batik tourism sector.
10	<i>Analisis Potensi Dan Strategi Pengembangan Objek Wisata Pantai Pasir Kencana Kota Pekalongan</i>	(Sabana et al., 2019)	2019	Qualitative	Discussed the potential of Pasir Kencana Beach for tourism development, recommending infrastructure improvements.
11	<i>Strategi Komunikasi City Branding Pemerintah Kota Pekalongan Dalam Mempromosikan World's City of Batik</i>	(Faradies, 2020)	2020	Qualitative	Explored communication strategies for promoting Pekalongan's city branding, emphasizing stakeholder collaboration.
13	<i>Dampak Pembangunan Jalan Tol Terhadap Faktor Sosial, Ekonomi Dan Lingkungan Pada Usaha Batik Dan Perhotelan di Kota Pekalongan</i>	(Siswanto et al., 2019)	2019	Quantitative	Examined the impact of toll road construction on social, economic, and environmental factors affecting batik and hospitality businesses.
14	<i>Sustainable Development Goals (SDGs) and the Emergence of Creative Cities in Indonesia: Comparative Studies from Pekalongan, Yogyakarta, And Surakarta During The COVID-19 Pandemic</i>	(Nugroho et al., 2022)	2022	Qualitative	Discussed the role of SDGs in promoting creative cities, comparing the experiences of Pekalongan, Yogyakarta, and Surakarta during the pandemic.
15	<i>Strategi Adaptasi UMKM Kuliner Pada Masa Pandemi Covid-19 (Studi Kasus: Rumah Makan Haji Masduki, Pekalongan)</i>	(Arofahtiani & Cahyadi, 2022)	2022	Qualitative	Analyzed adaptation strategies of culinary SMEs during the pandemic, focusing on resilience and community support.
16	<i>Tradisi Lopis Raksasa Dalam Perspektif Kerukunan Umat Beragama di Kota Pekalongan</i>	(Rosidin, 2016)	2016	Qualitative	Explored the cultural significance of the Lopis Raksasa tradition in fostering interfaith harmony in Pekalongan.

Table 3 (continue). Previous research related to sustainable tourism.

No.	Title	Author	Year	Methodology	Findings
17	<i>Analisis Perubahan Zona Nilai Tanah Akibat Keberadaan Lokasi Wisata Tahun 2016-2019 Di Kecamatan Pekalongan Utara Kota Pekalongan (Studi Kasus: Kecamatan Pekalongan Utara)</i>	(Muhammad <i>et al.</i> , 2020)	2020	Quantitative	Analyzed changes in land value zones due to tourism development, providing insights into economic impacts.
18	<i>Eksistensi Batik Encim Dalam Arena Produksi Kultural Di Pekalongan</i>	(Wulandari, 2021)	2021	Qualitative	Discussed the cultural significance and production dynamics of Batik Encim in Pekalongan.
19	<i>Dampak Ekonomi Dan Sosial Pada Tradisi Syawalan Di Kelurahan Krpyak Kota Pekalongan</i>	(Mahmudah, 2020)	2020	Qualitative	Examined the economic and social impacts of the Syawalan tradition, highlighting its role in community cohesion.
20	<i>Strategi Pengembangan Ekowisata Di Pusat Informasi Mangrove (PIM) Kelurahan Kandang Panjang Pekalongan</i>	(Faiqoh <i>et al.</i> , 2018)	2018	Qualitative	Proposed strategies for developing ecotourism in the mangrove information center, emphasizing sustainability and community involvement.

3.4. Discussion

Tourism research in Pekalongan Municipality predominantly focuses on Batik, cultural heritage, economic development, and policy, with sustainability receiving marginal attention. While Batik's cultural and economic prominence is well-documented (Budiarto *et al.*, 2024; Steelyana, 2012; Susanti, 2018), this narrow focus has created an imbalance, leaving critical areas like environmental conservation, ecotourism, and responsible management underexplored (Khasna, 2021; Kiswanto *et al.*, 2019). Existing studies frequently link tourism to economic gains and policy frameworks but rarely address their alignment with long-term sustainability objectives, raising concerns about the sector's resilience amid global environmental challenges (Guo & Liu, 2024).

Notably, sustainable infrastructure and green tourism practices remain overlooked. Current infrastructure research emphasizes accommodations and service quality, neglecting environmental sustainability, energy efficiency, and waste management. Future investigations should prioritize green building standards, eco-friendly hospitality practices, and digital innovations like smart tourism technologies to minimize ecological impacts (Alsharif *et al.*, 2024; El Archi *et al.*, 2023; Karim *et al.*, 2025; Sun & Nasrullah, 2024; Zhang & Deng, 2024).

Pekalongan's tourism branding also lacks sustainability integration, remaining centered on Batik and heritage (Yulius *et al.*, 2024). Research is needed on embedding responsible tourism narratives into marketing strategies, including eco-tourism promotion, sustainable travel packages, and visitor behavior campaigns (Vicente, 2024) to give position Pekalongan as a

sustainable destination. Community-driven sustainable tourism is another understudied area. While cultural preservation is emphasized, the potential of local engagement in eco-friendly craft production, conservation projects, and sustainable entrepreneurship remains unexplored (Khasna, 2021; Mahfudloh & Lestari, 2017). Empowering communities through education and training could enhance equitable benefits while reducing socio-environmental harms.

Addressing these gaps necessitates embedding sustainability into tourism education. Academic institutions should revise curricula to integrate sustainability principles, utilizing experiential learning and interdisciplinary collaborations with environmental science and urban planning (Abo-Khalil, 2024). Strengthening partnerships between universities, policymakers, and industry stakeholders will foster actionable strategies that balance economic growth with ecological and social responsibility (Naruetharadhol *et al.*, 2024). By prioritizing sustainability-focused research, Pekalongan can transform its tourism sector into a model of resilience and holistic development (see **Table 4**).

Table 4. Future research theme and directions.

No.	Theme	Directions
1	Sustainable Tourism and Economic Development	<ul style="list-style-type: none"> Investigate how sustainable tourism practices can enhance economic growth in Pekalongan. Assess the economic feasibility of green tourism initiatives, such as sustainable Batik production and eco-friendly accommodations.
2	Sustainable Tourism Infrastructure	<ul style="list-style-type: none"> Explore green building practices and energy-efficient hotel operations to reduce tourism's environmental footprint. Assess the sustainability of Pekalongan's tourism infrastructure, including waste management and public transportation for tourists.
3	Sustainability in Tourism Branding and Destination Marketing	<ul style="list-style-type: none"> Examine how Pekalongan can leverage its cultural heritage while incorporating sustainability in destination branding. Develop strategies for promoting eco-conscious tourism experiences to domestic and international visitors.
4	Community-Based Sustainable Tourism	<ul style="list-style-type: none"> Study how local communities can participate in and benefit from sustainable tourism initiatives. Identify best practices for integrating cultural heritage preservation with environmental sustainability, ensuring that tourism development does not harm Pekalongan's ecological and social fabric.
5	Ecotourism and Nature-Based Tourism Opportunities	<ul style="list-style-type: none"> Explore potential ecotourism sites in and around Pekalongan to diversify tourism beyond cultural attractions. Assess the feasibility of integrating mangrove conservation, coastal tourism, or agro-tourism into Pekalongan's tourism sector.

4. CONCLUSION

This study has examined tourism research in Pekalongan, highlighting key themes and the limited focus on sustainability. While discussions on Batik, cultural heritage, and economic development dominate, sustainability remains a marginal topic. The lack of integration between tourism and sustainable practices—such as green infrastructure, ecotourism, and responsible tourism branding—suggests an opportunity for further exploration. Additionally, community-based sustainable tourism is underdeveloped, despite its potential to create long-term benefits for local stakeholders.

Future research should bridge these gaps by incorporating sustainability into tourism education, policymaking, and industry practices. Academic institutions can play a vital role by

integrating sustainable tourism concepts into hospitality and tourism curricula, encouraging interdisciplinary research, and fostering student-led projects that explore eco-friendly tourism initiatives. By strengthening the connection between education and sustainable tourism development, future studies can help Pekalongan become a model for responsible and resilient tourism in Indonesia.

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6. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

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