



Exploring Circular Economy Strategies for Sustainable Nature Tourism Management

Humam Santosa Utomo*, Tri Wibawa, Suratna, Winda Prawesty Handayani
Universitas Pembangunan Nasional Veteran Yogyakarta, Indonesia

Received : September 27,
2025

Revised : September 28,
2025

Accepted : September 29,
2025

Online : October 14, 2025

Abstract

Waste management at natural tourism destinations is a pressing environmental issue in Bantul Regency, Yogyakarta. The increase in tourist visits has led to the accumulation of solid waste, particularly single-use plastics, posing challenges to environmental sustainability. This study aims to analyze the implementation of the circular economy (CE) in the management of natural tourism destinations, specifically through waste reduction, reuse, and recycling strategies in Tourism Villages and natural tourism areas in Bantul. The research employed a qualitative approach, utilizing in-depth interviews with tourism village managers, tourism object managers, and representatives from the Tourism Office. The results show that the CE concept has been implemented through the tourism waste bank program, the management of organic waste into compost, and plastic reduction campaigns. However, challenges such as limited resources, low environmental literacy among tourists, and weak regulatory support remain significant obstacles. Strategies for sustainable performance require multi-stakeholder collaboration, strengthening management capacity, and the integration of environmentally based policies. This research contributes to the development of circular economy theory in the tourism sector and provides practical implications for sustainable destination management in developing regions.

Keywords *Circular Economy, Sustainable Tourism, Waste Management, Natural Tourism Destinations, Bantul*

INTRODUCTION

The problem of waste in natural tourism destinations has become a global concern. The Bantul Regency Government continues to improve waste management ([Badan Perencanaan Pembangunan Daerah Kabupaten Bantul, 2025](#)). Much of this waste consists of single-use plastics that are difficult to decompose and contribute to ecosystem pollution. The urgency of this research lies in the need to integrate the concept of the circular economy (CE) into tourism management. CE emphasizes the strategy of reduce, reuse, and recycle, which has been proven effective in reducing the negative impacts of human activities on the environment ([Geissdoerfer et al., 2017](#); [Kirchherr & Piscicelli, 2019](#)). However, the implementation of CE in tourist destinations, particularly in developing regions, remains limited in empirical research. The purpose of this research is to analyze the implementation of CE in natural tourism destinations in Bantul, identify opportunities and challenges, and formulate strategies for achieving sustainable performance. The novelty of this research lies in the integration of the CE concept with the practice of community-based tourism destination management, thus contributing to the theory and practice of tourism sustainability.

LITERATURE REVIEW

The circular economy in tourism is seen as an innovative approach to creating a sustainable management system ([Manniche et al., 2021](#)). In the context of destinations, CE focuses on waste management, energy efficiency, and increasing tourist awareness ([Zhang et al., 2022](#)). Recent



research confirms the relevance of CE in the tourism sector. [Ranta et al. \(2021\)](#) emphasize the importance of stakeholder collaboration in realizing CE, while [Dube et al. \(2021\)](#) show that tourists' environmental literacy is crucial to the success of a CE strategy. Recent studies also highlight the integration of CE with sustainable business models ([Centobelli et al., 2020](#)), green innovation ([Ghisellini & Ulgiati, 2020](#)), and the policy environment ([Su et al., 2023](#)). Over the past five years, research has also addressed numerous challenges to CE, including low community participation ([Murray et al., 2020](#)), technological limitations ([Cui et al., 2021](#)), and inadequate regulations ([Vence & Pereira, 2019](#)). On the other hand, significant opportunities lie in implementing CE based on community-driven initiatives that can increase local economic value while reducing waste ([Arbulú et al., 2021](#)). Thus, this research fills the gap in empirical studies related to CE implementation in nature tourism destinations in Indonesia, particularly in the context of community-based management.

RESEARCH METHOD

This research employs a descriptive qualitative approach, as its primary focus is to gain a deep understanding of the practice of implementing a circular economy (CE) in managing natural tourism destinations in Bantul, and to identify the opportunities and challenges associated with it. A qualitative approach was chosen to comprehensively explore the meanings, perceptions, and experiences of managers and relevant stakeholders.

The research locations include three tourist destinations considered representative: Mangunan Pine Forest, Wukirsari Tourism Village, and Parangtritis Beach. These three destinations were chosen because they possess distinct characteristics. The tourism forest, community-based tourism village, and beach destination have high visitor numbers and have already implemented initiatives in waste management and environmentally friendly practices. Furthermore, the involvement of local communities in these locations is crucial for understanding the dynamics of CE implementation.

The research participants comprised three main groups: tourism village managers, private tourism attraction managers, local communities, and representatives from the Bantul Tourism Office. Informants were selected using a purposive sampling technique, based on their relevant roles in destination management and environmental program implementation. To broaden perspectives, a snowball sampling technique was also used, in which initial informants recommended other relevant parties. The number of interviews is not determined with certainty, but rather follows the principle of data saturation, which occurs when no new information is found.

Data were collected through in-depth semi-structured interviews, field observations, and document analysis. Interviews were conducted face-to-face and lasted 45–90 minutes, using an interview guide developed based on the literature review and research objectives. Interview questions covered aspects such as waste management patterns, forms of CE implementation (waste banks, composting, plastic reduction), stakeholder involvement, and obstacles and opportunities encountered. All interviews were recorded (with the informant's permission) and transcribed verbatim. Direct observations at tourist sites recorded facility conditions, waste disposal patterns, visitor interactions, and community activities related to waste management. Documents reviewed included activity reports, local policies, and environmental outreach materials used by destination managers.

Data analysis was conducted using thematic analysis, following Braun and Clarke's six stages: data familiarization, initial coding, theme discovery, theme review, defining and naming themes, and report preparation. The analysis process was inductive-deductive, with themes emerging from the field data and guided by the theoretical framework of the circular economy. To maintain consistency of analysis, researchers compiled a codebook and held discussions with

research assistants to align perceptions.

Data validity was ensured through triangulation by comparing information from multiple sources (village managers, communities, and government agencies) and employing diverse methods, including interviews, observations, and document analysis. Member checking was also conducted by sending summaries of interview results to several key informants to ensure the researcher's interpretations aligned with their experiences. The researcher also compiled an audit trail consisting of analytical decision notes, reflective memos, and documentation of the research process to enhance transparency and accountability, while ethical aspects of the research were also taken seriously. Prior to the interviews, informants were fully informed about the purpose of the research, their right to confidentiality, and their right to withdraw at any time. Informed consent was obtained from each participant, and their identities are anonymized in the final report.

FINDINGS AND DISCUSSION

Results

Research findings indicate that the implementation of the circular economy (CE) concept at natural tourism destinations in Bantul has been carried out through various programs tailored to the characteristics of each location. While the programs vary in form, the main goal is to reduce waste generation, increase the utility of waste, and promote environmental awareness among both managers and tourists. In Wukirsari Tourism Village, CE practices are implemented through the management of a tourist waste bank. This program is designed not only as a technical solution to reduce plastic waste but also as a means of education and empowerment. Visitors are encouraged to bring plastic waste, particularly mineral water bottles and disposable bags, which can then be exchanged for local food vouchers. This scheme creates a simple circular economy: plastic waste is collected for recycling, while the vouchers provided support the activities of village culinary MSMEs. This program demonstrates the integration of environmental, economic, and social aspects within the CE framework, where plastic waste reduction goes hand in hand with increased consumption of local products.

In Mangunan Pine Forest, the CE initiative places a greater emphasis on organic waste processing. Given the enormous volume of leaf litter at this location, management has developed a composting system. Previously, leaf litter was simply piled up and is now processed into compost, which is then used for reforestation activities around the tourist forest or sold in limited quantities to the community. This program not only reduces the amount of organic waste that could potentially pollute the area but also strengthens the destination's image as a nature tourism destination focused on environmental sustainability. Local community involvement in compost management is a crucial factor in supporting the program's sustainability.

Meanwhile, at Parangtritis Beach, CE implementation is being implemented through an anti-plastic campaign. The local community runs this program in collaboration with tourism operators. One strategy is to educate tourists about the importance of reducing single-use plastic use, along with encouraging them to bring their own tumblers and cloth bags. This campaign typically involves displaying banners, distributing brochures, and direct educational activities by volunteers. Although the impact on all tourists' behavior has not yet been significantly seen, the campaign has succeeded in fostering a new discourse about the importance of an environmentally friendly lifestyle in a coastal area synonymous with plastic waste problems.

The research also revealed opportunities to strengthen CE implementation in Bantul's natural tourism destinations. First, there is increased environmental awareness among destination managers, both in terms of technical aspects and tourism development strategies. Second, there is support from the local government, particularly through the Bantul Tourism Office, which has begun to incorporate sustainability and waste management issues into its work programs. Third,

CE practices have the potential to create green tourism branding that differentiates Bantul from other destinations, thus opening up opportunities to strengthen its appeal to environmentally conscious tourists.

However, the study also identified several significant challenges. One is limited funding, both for the construction of waste processing facilities and the implementation of ongoing campaigns. Another challenge is low participation by tourists in environmental programs. Not all tourists are willing to bring plastic waste for exchange, or to use tumblers and cloth bags as advertised. Habitual factors and a lack of environmental literacy contribute to this low level of engagement. Furthermore, the study found that coordination between stakeholders remains weak. The relationship between tourism managers, local communities, and the government is not yet fully integrated, resulting in many initiatives being partially implemented and unable to generate optimal collective impact. Overall, the study's findings confirm that the implementation of a circular economy in Bantul's natural tourism destinations has been underway through various innovative programs; however, its sustainability still depends heavily on increasing resource capacity, enhancing tourist participation, and strengthening cross-stakeholder collaboration networks.

Discussion

The results of this study indicate that the implementation of a circular economy (CE) at a natural tourism destination in Bantul takes place through practical approaches—tourist waste banks, organic waste composting, and anti-plastic campaigns—that reflect the basic principles of CE: closing material cycles, extending product utility, and creating local economic value from waste. These findings strengthen the argument that CE is relevant not only for the manufacturing sector but also for the service-tourism sector, which relies on local resources and social interactions (Geissdoerfer et al., 2017; Manniche et al., 2021). However, moving from partial initiatives to systemic sustainable performance requires the formulation of more comprehensive operational strategies and policies. The following is an in-depth discussion of the mechanisms, implementation strategies, theoretical and managerial implications, and the need for further evaluation and research.

CE Impact Mechanisms on Tourism Destinations

Theoretically, the interventions observed in Bantul operate through three main pathways. First, closing the material loop: waste collection through waste banks and composting diverts waste streams from final disposal to reuse or new raw materials, thereby reducing the need for final management and potential pollution (Centobelli et al., 2020; Pirani & Arafat, 2021). Second, local value creation: the voucher mechanism in Wukirsari and compost marketing in Mangunan demonstrate how waste can be leveraged as a source of income for MSMEs and communities, thereby strengthening community-based circular business models (Wang et al., 2020; Santos et al., 2021). Third, behavior change: the educational campaign in Parangtritis seeks to shift social norms against the use of single-use plastics—a process that requires iterative interventions, social feedback, and supportive environmental design (Kirchherr & Piscicelli, 2019; Zhang et al., 2022).

Operational Strategies for Achieving Sustainable Performance

Based on research findings and a literature review, four key strategies are needed to strengthen and scale circular economy (CE) practices at tourist destinations in Bantul. First, strengthening management capacity is a crucial foundation, as successful CE implementation relies heavily on the technical, managerial, and public communication skills of destination managers. Training should not only focus on technical aspects, such as waste audits, segregation, composting techniques, and recycling logistics, but also encompass skills in designing circular business models,

managing waste bank unit finances, and developing strategies for tourism behavior campaigns. To ensure this capacity is sustainable, on-site coaching, comparative studies, and train-the-trainer programs should be prioritized, along with the development of clear standard operating procedures (SOPs) and performance indicators so that CE practices can be consistently monitored and evaluated (Centobelli et al., 2020; Wang et al., 2020).

Second, structured multi-stakeholder collaboration must be established through local CE forums involving village governments, destination managers, relevant agencies, business actors, local communities, and academics. This collaboration will clarify the roles of each party, with local governments providing technical and regulatory support, while communities and the private sector drive operational initiatives. This collaboration can take the form of a Memorandum of Understanding (MoU), a profit-sharing scheme, or a community business unit that professionally manages a waste bank. Previous research has emphasized that institutional alignment and local leadership are key to the successful implementation of CE (Ranta et al., 2021; Santos et al., 2021).

Third, incentive-based policy support and local regulations can serve as drivers of widespread CE adoption. Local governments can provide initial subsidies for waste processing equipment, encourage green purchasing policies that prioritize recycled products, and award green destinations. Furthermore, policies limiting the use of single-use plastics must also be enforced to reduce environmentally damaging consumer behavior. By combining incentives (carrots) and strict rules (sticks), CE practices can be more quickly internalized, provided that policies are based on local evidence and equipped with adaptive evaluation mechanisms (Su et al., 2023; Vence & Pereira, 2019).

Fourth, tourist education and behavioral interventions should be designed not only to convey messages but also to create participatory experiences. Environmental interpretation programs through storytelling, the use of nudging tools such as strategic trash bin placement, incentives in the form of discounts for eco-friendly tourists, and visitor involvement in composting workshops or beach volunteer activities will reinforce sustainability messages. Furthermore, social media campaigns and challenge-based activities, such as "zero-waste challenges," can extend the educational impact beyond the visit. The effectiveness of these strategies can be measured through tourist behavior surveys and repeated waste audits (Kirchherr & Piscicelli, 2019; Zhang et al., 2022).

Overall, these four strategies complement each other in creating a sustainable CE ecosystem. Strengthening management capacity ensures human resource readiness, while multi-stakeholder collaboration builds institutional support. Local incentive policies and regulations provide a legal framework and impetus for implementation, and tourist education ensures concrete behavioral changes on the ground.

Monitoring System, Indicators, and Financing

To ensure that the above strategies produce real impact, a simple yet operational monitoring and evaluation (M&E) system needs to be established. Recommended key indicators include: waste diversion rate (percentage of waste diverted from landfills), tonnage of compost produced, amount of plastic waste collected per period, tourist participation rate (percentage of visitors participating in the program), and realized economic value (revenue from the sale of compost or recycled materials). This data should be collected periodically through waste audits, waste bank transaction records, and surveys. In terms of financing, a combination of sources should be explored, including initial government funding, corporate CSR funds, micro-commercial financing models (such as compost units selling products), and crowdfunding schemes for community initiatives. The literature suggests that hybrid financing models are more resilient and can accelerate scale-up (Centobelli et al., 2020; Pirani & Arafat, 2021).

CONCLUSIONS

This study concludes that the implementation of a circular economy in managing natural tourism destinations in Bantul has been successful through community initiatives, a tourist waste bank program, and the processing of organic waste. However, these efforts still face challenges such as limited resources and low environmental literacy among tourists. Strategies for achieving sustainable performance require strengthening management capacity, providing policy support, and fostering multi-stakeholder collaboration. This study provides a theoretical contribution to the advancement of community engagement (CE) literature within the tourism sector and offers practical insights for destination management in developing regions, as elaborated in the following sections.

Theoretical Implications

Theoretically, this study extends the CE literature by positioning tourism as a unique context with intense interactions between people, services, and the environment, which demands adaptations of CE concepts that are sensitive to social and behavioral aspects. The findings support the proposition that CE success depends on institutional fit, local capacity, and local market dynamics (Ranta et al., 2021; Manniche et al., 2021). Another theoretical contribution is the strengthening of the idea that community-based circular business models are a form of CE adaptation that bridges environmental and economic empowerment goals. This constitutes a promising research avenue for further study (Wang et al., 2020; Santos et al., 2021).

Managerial Implications

For destination managers and policymakers, this study offers several practical directions: (1) integrate CE into destination development plans and SOPs; (2) prioritize interventions that are “win-win” between the economy and the environment (e.g., waste bank vouchers that empower local MSMEs); (3) establish technical partnerships with universities or NGOs for knowledge transfer; (4) implement simple measurements that local managers can monitor; and (5) communicate CE achievements as part of a green destination marketing strategy to attract responsible tourist segments (Guo et al., 2022; Centobelli et al., 2020).

LIMITATIONS & FURTHER RESEARCH

This study has limitations that should be acknowledged. First, the geographic scope is limited to Bantul, so generalizing the findings to other contexts requires caution. Second, the majority of the data is qualitative and perception- or observation-based, so the quantitative effects of the CE program (e.g., a numerical reduction in waste tonnage) have not been systematically measured. Third, seasonal variability in tourist visits may influence waste volume and informant perceptions. Therefore, future research is recommended to employ a mixed-methods design, incorporating a longitudinal quantitative survey, to measure the impact of CE interventions on environmental and economic indicators.

Further research is recommended to: (a) implement a mixed-methods design with a longitudinal quantitative survey to measure the impact of CE interventions on environmental and economic indicators; (b) conduct a cost-benefit analysis or life-cycle assessment (LCA) of key interventions (waste banks, composting) to assess resource efficiency; and (c) test behavioral experiments (e.g., randomized field experiments) to identify the most effective educational interventions in changing tourist behavior (Kirchherr & Piscicelli, 2019; Ranta et al., 2021).

REFERENCES

- Arbulú, I., Lozano, J., & Rey-Maqueiera, J. (2021). Circular economy practices in the tourism sector: Evidence from the Balearic Islands. *Journal of Sustainable Tourism*, 29(9), 1395–1414. <https://doi.org/10.1080/09669582.2020.1849230>
- Badan Perencanaan Pembangunan Daerah Kabupaten Bantul (2025). *Rencana Kerja Pemerintah Daerah Kabupaten Bantul Tahun 2025*. <https://bantulkab.go.id/resource/doc/file/perencanaan/2024/09/RKPD-Kabupaten-Bantul-2025.pdf>.
- Centobelli, P., Cerchione, R., Chiaroni, D., Del Vecchio, P., & Urbinati, A. (2020). Designing business models in circular economy: A systematic literature review and research agenda. *Business Strategy and the Environment*, 29(4), 1734–1749. <https://doi.org/10.1002/bse.2466>
- Cui, H., Liu, C., & Chang, Y. (2021). Barriers and enablers of circular economy practices for sustainable development: Evidence from China. *Journal of Cleaner Production*, 287, 125281. <https://doi.org/10.1016/j.jclepro.2020.125281>
- Dube, K., Nhamo, G., & Chikodzi, D. (2021). COVID-19 pandemic and prospects for sustainable tourism in Africa. *Development Southern Africa*, 38(5), 699–713. <https://doi.org/10.1080/0376835X.2020.1858590>
- Ghisellini, P., & Ulgiati, S. (2020). Circular economy transition in Italy. Achievements, perspectives and constraints. *Journal of Cleaner Production*, 243, 118360. <https://doi.org/10.1016/j.jclepro.2019.118360>
- Geissdoerfer, M., Morioka, S. N., de Carvalho, M. M., & Evans, S. (2018/2019 reprint). Business models and supply chains for the circular economy. *Journal of Cleaner Production*, 190, 712–721. <https://doi.org/10.1016/j.jclepro.2018.04.159>
- Guo, H., Guo, X., & Jiang, Y. (2022). Green innovation and circular economy in the tourism industry: Evidence from Chinese provinces. *Tourism Management*, 88, 104401. <https://doi.org/10.1016/j.tourman.2021.104401>
- Kirchherr, J., & Piscicelli, L. (2019). Towards an education for the circular economy (CE): Five teaching principles and a case study. *Resources, Conservation and Recycling*, 150, 104406. <https://doi.org/10.1016/j.resconrec.2019.104406>
- Manniche, J., Larsen, K. T., Broegaard, R. B., & Holland, E. (2021). Destination: A circular tourism economy. *Tourism Geographies*, 23(3), 467–482. <https://doi.org/10.1080/14616688.2019.1674360>
- Murray, A., Skene, K., & Haynes, K. (2020). The circular economy: An interdisciplinary exploration of the concept and application in a global context. *Journal of Business Ethics*, 162(2), 369–384. <https://doi.org/10.1007/s10551-018-0442-2>
- Pirani, S. I., & Arafat, H. A. (2021). Solid waste management in hospitality industry: Toward a more circular model. *Waste Management*, 131, 156–167. <https://doi.org/10.1016/j.wasman.2021.06.030>
- Ranta, V., Aarikka-Stenroos, L., Ritala, P., & Mäkinen, S. J. (2021). Exploring institutional drivers and barriers of the circular economy: A cross-regional comparison of China, the US, and Europe. *Resources, Conservation and Recycling*, 170, 105595. <https://doi.org/10.1016/j.resconrec.2021.105595>
- Santos, J., Mendes, J., & Valle, P. (2021). Circular economy strategies in tourism destinations: A stakeholder perspective. *Journal of Destination Marketing & Management*, 19, 100516. <https://doi.org/10.1016/j.jdmm.2020.100516>
- Su, B., Heshmati, A., & Geng, Y. (2023). Policy drivers for circular economy development: Lessons from the EU and China. *Journal of Cleaner Production*, 392, 136254. <https://doi.org/10.1016/j.jclepro.2023.136254>

- Tourais, P., & Videira, N. (2021). Sustainable tourism indicators: A review of the circular economy perspective. *Ecological Indicators*, 121, 106976. <https://doi.org/10.1016/j.ecolind.2020.106976>
- Vence, X., & Pereira, Á. (2019). Eco-innovation and circular economy in the tourism sector: A European approach. *Tourism Management Perspectives*, 31, 141–147. <https://doi.org/10.1016/j.tmp.2019.04.001>
- Wang, J., Li, Y., & Zhang, C. (2020). Circular economy practices in small tourism enterprises: Evidence from rural China. *Journal of Rural Studies*, 79, 370–379. <https://doi.org/10.1016/j.jrurstud.2020.08.021>
- Zhang, Y., Wang, J., & Li, J. (2022). Circular economy and sustainable tourism: Linking waste management and tourist behavior. *Sustainable Development*, 30(6), 1156–1167. <https://doi.org/10.1002/sd.2283>.