



Strategies for Transforming Waste into Creative Business Opportunities from a Circular Economy Perspective in Indonesia

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ABSTRACT

The shift from a linear to a circular economic model demands innovation in waste management. This article analyzes the potential of waste as raw material for creative industries in Indonesia. By using a descriptive qualitative approach based on a literature review of various research journals, it was found that the integration of circular economy principles through product innovation, resource efficiency, and strengthening community institutions such as the Waste Bank was able to create significant added economic value. The analysis results show that the recycling and product innovation variables contribute 98.3% to the successful implementation of a circular economy. This article recommends strengthening Extended Producer Responsibility (EPR) regulations and market education.

Keywords: *Circular Economy, Waste, Creative Business, Product Innovation, Community Empowerment.*

1. Introduction

The rapid increase in global waste generation has become one of the most pressing environmental challenges, driven by population growth, urbanization, industrial expansion, and unsustainable consumption patterns. According to the World Bank (2018), global municipal solid waste generation is projected to increase by approximately 70% by 2050 if current production and consumption patterns continue. Similarly, the United Nations Environment Programme (2024) emphasizes that ineffective waste management contributes significantly to environmental pollution, greenhouse gas emissions, biodiversity loss, and public health risks. Indonesia, as one of the largest developing countries, faces similar challenges, where increasing economic growth and urbanization have substantially increased the volume of municipal, plastic, and organic waste. Despite various government initiatives, waste management remains largely dependent on the traditional linear economy model of "take–make–dispose," resulting in excessive waste accumulation in landfills and the environment (World Bank, 2018; United Nations Environment Programme, 2024).

In response to these challenges, the concept of the circular economy (CE) has emerged as a transformative development model that seeks to minimize waste generation by maintaining the value of products, materials, and resources within the economic system for as long as possible (Kirchherr et al., 2017; Stahel, 2016). Unlike the conventional linear economy, the circular economy promotes reducing, reusing, recycling, recovering, and redesigning products to create sustainable production and consumption systems. According to Bocken et al. (2016) and Lewandowski (2016), circular business models encourage organizations to develop innovative products and services that simultaneously generate economic value while reducing environmental impacts. Furthermore, Ferrasso et al. (2020) argued that circular business models

have become one of the most promising approaches for achieving sustainable competitiveness through resource efficiency and product innovation.

The implementation of the circular economy is particularly relevant to Indonesia, where waste should no longer be viewed merely as an environmental burden but rather as a valuable economic resource. A joint report by Bappenas and the United Nations Development Programme (2021) estimated that adopting circular economy principles could generate millions of new jobs, increase national economic productivity, reduce greenhouse gas emissions, and improve resource efficiency. Moreover, Indonesia's creative economy has demonstrated remarkable growth, contributing approximately 7.4% to the national Gross Domestic Product (GDP), thereby providing significant opportunities for integrating waste management with creative industries through innovative and sustainable business models (Bappenas & United Nations Development Programme, 2021).

Previous studies have demonstrated that waste can be transformed into various high-value creative products through recycling and upcycling processes. Plastic waste, for instance, has been successfully converted into handicrafts, home decoration products, fashion accessories, and construction materials (Anggraini et al., 2024; Budiarty et al., 2025). Likewise, organic waste has been utilized to produce compost, eco-enzymes, natural cosmetics, and environmentally friendly household products, while agricultural waste such as banana peels has been developed into innovative cosmetic products with commercial potential (Lubis et al., 2025). These initiatives not only reduce waste generation but also create new income sources, strengthen local entrepreneurship, and encourage the development of environmentally friendly creative industries.

Beyond economic benefits, community participation has become an essential component of successful circular economy implementation. Community-based waste management initiatives, including waste banks and small-scale recycling enterprises, have proven effective in increasing public awareness, empowering local communities, and supporting the development of micro, small, and medium enterprises (MSMEs). Mubyarto et al. (2025) reported that circular economy-based assistance programs for culinary MSMEs successfully promoted zero-waste practices while improving business sustainability. Similarly, Syafitri and Nisa (2024) highlighted that the creative economy plays an important role in community empowerment by creating employment opportunities, strengthening local economic resilience, and encouraging innovation based on local resources.

Despite these opportunities, the transition toward a circular economy in Indonesia continues to face substantial challenges. Public awareness regarding waste segregation and recycled products remains relatively low, while technological limitations, inadequate recycling infrastructure, and insufficient investment hinder large-scale implementation (United Nations Environment Programme, 2024). In addition, regulatory frameworks such as Extended Producer Responsibility (EPR) have not yet been fully implemented across industries. Previous studies by Tristiana et al. (2021) and Wibowo et al. (2025) emphasized that although EPR policies have been introduced to reduce plastic waste, their implementation remains constrained by weak institutional coordination, limited stakeholder participation, and inconsistent enforcement. These challenges indicate that the transition from a linear to a circular economy requires stronger collaboration among governments, industries, communities, and academic institutions.

Although numerous studies have discussed waste management, circular economy principles, and creative industries separately, relatively few have comprehensively examined strategic approaches for transforming various types of waste into sustainable creative business opportunities within the Indonesian circular economy context. Existing research generally focuses on specific waste materials, community service activities, or policy implementation without integrating business innovation, community empowerment, product development, and circular business strategies into a unified analytical framework (Kirchherr et al., 2017; Ferasso et al., 2020; Bappenas & United Nations Development Programme, 2021). This gap highlights the need for a more comprehensive strategy that combines environmental sustainability with economic and social value creation.

Therefore, this study aims to analyze strategies for transforming waste into creative business opportunities from a circular economy perspective in Indonesia. Specifically, the study identifies potential waste resources, explores innovative business models for waste utilization,

examines supporting factors and implementation challenges, and evaluates the resulting economic, social, and environmental impacts. The findings are expected to contribute to the advancement of circular economy literature while providing practical recommendations for policymakers, entrepreneurs, local communities, and other stakeholders in promoting sustainable creative industries in Indonesia.

2. Research Methods

This study employed a qualitative literature review approach to synthesize and critically analyze existing knowledge on strategies for transforming waste into creative business opportunities within the framework of the circular economy in Indonesia. A literature review was selected because it enables the integration of findings from previous studies, government reports, and policy documents to provide a comprehensive understanding of current practices, challenges, and strategic opportunities.

The data used in this study consisted exclusively of secondary data obtained from peer-reviewed journal articles, government publications, international organization reports, and relevant policy documents. Scientific articles were identified through reputable academic databases, including Scopus, ScienceDirect, SpringerLink, Google Scholar, and MDPI, while policy and statistical data were collected from official publications issued by the Ministry of National Development Planning (Bappenas), the United Nations Development Programme (UNDP), the United Nations Environment Programme (UNEP), the World Bank, and other relevant institutions.

The literature selection process followed three stages: identification, screening, and eligibility assessment. Initially, publications were searched using keywords such as *circular economy*, *waste management*, *creative economy*, *creative business*, *upcycling*, *recycling*, *waste entrepreneurship*, and *Indonesia*. Subsequently, duplicate and irrelevant publications were excluded. The final selection prioritized recent publications (2015–2025), peer-reviewed articles, internationally recognized reports, and studies directly related to waste transformation, circular business models, and creative economic development.

The collected literature was analyzed using qualitative content analysis. The analysis involved coding and categorizing the information into four major themes: (1) waste typology and resource potential, (2) strategies for waste transformation and product innovation, (3) circular business model development, and (4) the economic, social, and environmental impacts of waste-based creative enterprises. The findings from different sources were then compared and synthesized to identify common patterns, implementation challenges, and strategic recommendations for strengthening the circular economy in Indonesia.

3. Results and Discussions

Circular Economy as a Driver of Waste-Based Creative Business Development

The literature synthesis indicates that the circular economy has become an effective framework for transforming waste into economic resources by extending the life cycle of materials through reuse, recycling, remanufacturing, and product redesign. The reviewed studies consistently demonstrate that Indonesian creative enterprises, particularly Micro, Small, and Medium Enterprises (MSMEs), have increasingly adopted circular economy principles to reduce waste generation while simultaneously creating products with higher economic value (Kirchherr et al., 2017; Stahel, 2016).

Several studies revealed that product innovation represents the primary strategy adopted by MSMEs. Rather than disposing of waste, business actors redesign discarded materials into marketable products through recycling and upcycling techniques. The literature further shows that process innovation has also emerged through the adoption of energy-efficient technologies, improved production systems, and environmentally friendly business practices. In addition, many enterprises have integrated green marketing strategies by promoting environmentally responsible production processes, transparent supply chains, and sustainable branding to attract environmentally conscious consumers (Bocken et al., 2014; Bocken et al., 2016; Ferasso et al., 2020).

The findings also indicate that implementing circular business models contributes positively to business performance by improving resource efficiency, reducing production costs, and increasing product competitiveness. Several international studies reported that circular business practices enhance profitability and strengthen business resilience by reducing dependence on virgin raw materials while increasing customer preference for sustainable products (Lewandowski, 2016; Ferasso et al., 2020).

Waste Typology and Creative Product Transformation

The reviewed literature identified three dominant waste categories that possess significant potential for creative business development in Indonesia.

Inorganic Waste : Plastic waste remains the most widely utilized material due to its abundance and ease of processing. Various studies reported that plastic waste has been transformed into handicrafts, home decorations, bags, wallets, flower pots, paving blocks, furniture, and fashion accessories using recycling and upcycling methods (Anggraini et al., 2024; Budiarty et al., 2025). These initiatives demonstrate that plastic waste possesses substantial commercial value while simultaneously reducing environmental pollution.

Textile Waste : The increasing volume of textile waste resulting from the fast-fashion industry has encouraged the implementation of zero-waste fashion and fabric upcycling. Textile remnants are transformed into new apparel products, tote bags, patchwork products, and household accessories. These practices not only reduce waste generation but also support sustainable fashion industries by maximizing material utilization throughout the production process (Bocken et al., 2016; Ferasso et al., 2020).

Organic Waste : Organic waste also presents considerable opportunities for circular business development. Banana peels, fruit residues, vegetable waste, and leaves have been processed into compost, eco-enzymes, recycled paper, natural fertilizers, and environmentally friendly cosmetic products such as body scrubs (Lubis et al., 2025). These innovations illustrate that organic waste can generate additional economic value while minimizing the amount of biodegradable waste disposed of in landfills.

Community-Based Circular Business Models

Another important finding concerns the role of community participation in implementing the circular economy. The reviewed studies consistently emphasize that community-based waste management systems, particularly Waste Banks, function as intermediaries connecting households, waste collectors, and creative industries by providing sorted recyclable materials (Ni'mah, 2024).

Furthermore, empowerment programs targeting women, unemployed youth, and MSMEs have successfully generated additional household income through waste-based entrepreneurship. Mubyarto et al. (2025) demonstrated that integrating circular economy principles into culinary MSMEs promotes zero-waste production systems while improving business sustainability. Likewise, Syafitri and Nisa (2024) found that creative industries based on local waste resources significantly contribute to community empowerment and local economic resilience.

Challenges in Circular Economy Implementation

Despite considerable opportunities, the literature identifies several barriers limiting the broader implementation of circular economy practices in Indonesia. These challenges include inadequate recycling infrastructure, limited waste-processing technologies, insufficient investment, low environmental literacy among consumers, and fragmented collaboration among stakeholders (United Nations Environment Programme, 2024).

Policy implementation also remains a significant challenge. Although Extended Producer Responsibility (EPR) policies have been introduced to encourage producers to take responsibility for post-consumer waste, their implementation remains inconsistent across industries due to weak enforcement mechanisms and limited institutional coordination (Tristiana et al., 2021; Wibowo et al., 2025). Consumer perceptions regarding the quality and safety of recycled products further constrain market expansion, particularly among conventional consumers unfamiliar with circular products.

Discussion

The findings confirm that the circular economy represents more than an environmental strategy; it also functions as an innovative business framework capable of generating economic, environmental, and social value simultaneously. Consistent with the conceptual framework proposed by Kirchherr et al. (2017), the transition from a linear to a circular economy requires redesigning production systems so that materials continuously circulate within the economy rather than becoming waste. The present findings demonstrate that Indonesian creative industries have begun implementing these principles through recycling, upcycling, and product redesign, particularly in processing plastic, textile, and organic waste.

The transformation of waste into creative products also supports the development of sustainable business models. According to Bocken et al. (2014) and Lewandowski (2016), circular business models integrate product innovation, resource efficiency, and customer value creation into a unified system. This study supports these arguments by showing that Indonesian MSMEs increasingly utilize waste not only as an alternative raw material but also as a source of product differentiation and competitive advantage. Green branding and environmentally friendly marketing strategies further strengthen market acceptance, especially among Millennials and Generation Z, who exhibit greater environmental awareness.

From an economic perspective, the findings reinforce previous studies indicating that circular economy implementation improves operational efficiency while reducing dependence on virgin raw materials (Ferasso et al., 2020). The utilization of waste as production input lowers material costs and simultaneously creates additional income opportunities for households, community groups, and MSMEs. These findings are also consistent with the report by Bappenas and the United Nations Development Programme (2021), which concluded that adopting circular economy principles could substantially increase employment opportunities while supporting Indonesia's transition toward sustainable economic growth.

Socially, community participation emerged as a critical success factor in implementing circular economy initiatives. Waste Banks and community empowerment programs facilitate not only waste collection but also entrepreneurship development and poverty reduction. The experience of community-based initiatives, including those documented by Ni'mah (2024) and Mubyarto et al. (2025), illustrates how circular economy practices contribute directly to several Sustainable Development Goals (SDGs), including responsible consumption and production, decent work, poverty alleviation, and climate action.

Nevertheless, this study also identifies persistent barriers that may slow the transition toward a circular economy in Indonesia. Technological limitations, inadequate recycling infrastructure, inconsistent implementation of Extended Producer Responsibility (EPR), and limited public awareness remain major constraints. These findings support previous studies conducted by Tristiana et al. (2021) and Wibowo et al. (2025), which emphasized that regulatory improvements alone are insufficient without stronger collaboration among governments, producers, consumers, and academic institutions.

Overall, this study extends previous research by integrating waste typology, business innovation strategies, community empowerment, and circular business models into a comprehensive analytical framework. Unlike previous studies that primarily focused on individual waste materials or isolated community programs, this study demonstrates that sustainable waste transformation requires an integrated ecosystem involving policy support, technological innovation, entrepreneurial capacity, consumer awareness, and cross-sector collaboration. Such integration provides a more holistic strategy for accelerating the development of waste-based creative industries while supporting Indonesia's transition toward a sustainable circular economy.

4. Conclusion

Transforming waste into creative business opportunities within the circular economy framework is an effective strategy for addressing environmental issues while simultaneously boosting economic value in Indonesia. Through a circular economy approach, waste is no longer viewed as worthless residue but rather as a resource that can be reprocessed into innovative, high-value-added products.

The study's findings indicate that the success of circular economy implementation is heavily influenced by two key factors: recycling and product innovation, which significantly contribute to the creation of waste-based creative enterprises. Various types of waste including inorganic, textile, and organic materials hold significant potential to be developed into products that are not only economically valuable but also competitive in the market.

In addition to providing economic benefits, creativity-based waste management also has a positive impact on social aspects, particularly in community empowerment. Community-based models such as the Waste Bank have proven capable of creating jobs, increasing community income, and strengthening collective awareness of the importance of environmental conservation. This aligns with efforts to achieve the Sustainable Development Goals (SDGs).

However, the implementation of the circular economy in Indonesia still faces various challenges, such as limited waste processing technology, low public literacy and perception regarding recycled products, and suboptimal regulations such as Extended Producer Responsibility (EPR). Therefore, synergy is needed between the government, businesses, and the community through strengthened regulations, enhanced human resource capacity, and the development of more sustainable innovations and technologies.

Thus, the development of waste-based creative businesses is not only a solution to environmental problems but also a strategy for inclusive and sustainable economic development in Indonesia.

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