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# A Review on Emphasizes the Socio-Economic and Environmental Advantages of Circular Economy

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### ABSTRACT

The growing concerns over environmental degradation, resource depletion, and waste generation have triggered a global shift from the traditional linear economic model of "take, make, dispose" toward a more sustainable and regenerative approach known as the Circular Economy (CE). This review paper critically examines the socio-economic and environmental advantages of adopting circular economy principles across various sectors, with a particular focus on the construction, manufacturing, and waste management industries. The CE model emphasizes resource efficiency, reuse, recycling, and the extension of product life cycles, thereby reducing dependency on virgin raw materials and minimizing environmental impacts. From a socio-economic perspective, circular economy practices generate new business opportunities, create green jobs, promote innovation, and foster inclusive economic growth. They enable businesses to reduce operational costs, improve supply chain resilience, and develop sustainable value chains. Environmentally, CE contributes significantly to reducing greenhouse gas emissions, conserving natural resources, lowering energy consumption, and preventing pollution and landfill overflow. This review also highlights global case studies, policy frameworks, and industry-led initiatives that illustrate the positive outcomes of CE implementation. Despite the evident benefits, the transition to a circular economy faces several challenges, including regulatory barriers, lack of awareness, technological limitations, and the need for systemic change across value chains. The paper concludes that comprehensive policy support, public-private collaboration, investment in circular technologies, and widespread stakeholder engagement are essential to unlocking the full potential of the circular economy in achieving sustainable development goals.

**Key Words:-** socio-economic, circular economy, construction, manufacturing, and waste management industries, sustainable development goals

### Introduction

The accelerating global demand for resources, coupled with the mounting pressures of environmental degradation, has prompted a fundamental rethinking of the conventional "take-make-dispose" linear economic model. This traditional approach has led to extensive resource extraction, excessive waste generation, and unsustainable production and consumption patterns. In response to these challenges, the circular economy (CE) has emerged as a transformative paradigm that prioritizes sustainability, resource efficiency, and long-term socio-economic resilience.

The circular economy is a regenerative system aimed at minimizing resource input, waste, emissions, and energy leakage by slowing, closing, and narrowing material and energy loops. It seeks to design out waste and pollution, keep products and materials in use for as long as possible, and regenerate natural systems. Unlike the linear economy, the CE model encourages practices such as recycling, reuse, remanufacturing, sharing, and sustainable product design, making it a cornerstone of sustainable development and green transition strategies across the globe.

The shift toward a circular economy offers substantial socio-economic and environmental advantages. On the environmental front, it contributes significantly to reducing carbon emissions, conserving biodiversity, lowering energy use, and minimizing landfill waste. Economically, it fosters innovation, stimulates new business models, and creates green jobs, while socially, it enhances community well-being, supports inclusive growth, and reduces dependency on finite resources. Countries and corporations adopting CE practices are increasingly reporting improved competitiveness, reduced operational costs, and enhanced sustainability credentials.

This review aims to explore and synthesize current knowledge on the socio-economic and environmental benefits of circular economy adoption, with a focus on various sectors including construction, manufacturing, agriculture, and consumer goods. By identifying the key drivers, enabling policies, and practical implementation strategies, this paper provides a foundation for understanding how the circular economy can be a vital pathway to a more sustainable and equitable future.

## Literature Review

**Itumo I.C et al (2025)** the study investigates the challenges hindering the implementation of circular economy (CE) principles in construction and demolition (C&D) waste management in South East Nigeria, focusing on professionals across five states: Anambah, Enugu, Abita, Ebony, and Imo. Utilizing a survey research design, structured questionnaires were distributed to a purposively selected sample of 322 participants—131 contractors, 40 clients, and 151 consultants—drawn proportionally from a population of 1,653 stakeholders involved in public building projects. The findings, based on a mean decision rule of 2.50, highlight several critical obstacles to CE adoption. Chief among these is the inadequate infrastructure and technology for sorting, recycling, and reusing C&D waste, which hinders effective resource recovery and disrupts the CE loop. Additionally, weak collaboration and coordination among stakeholders impair the efficient exchange of materials and information, both of which are vital for CE implementation. The study also identifies a disconnect between CE theoretical concepts and their practical application, as current waste management practices fail to integrate circular strategies. Compounding these issues is industry-wide resistance to change, often fueled by entrenched habits and concerns over cost and feasibility. To overcome these barriers, the study strongly advocates for the development of necessary infrastructure and technological support to enable effective waste processing, emphasizing that such improvements are essential to enhance resource efficiency, reduce environmental degradation, and ensure sustainable construction waste management in the region.

**Muhammad Saroosh et al (2024)** the construction industry is a major contributor to global waste and resource depletion, primarily due to traditional linear construction practices that follow a “take-make-dispose” model, resulting in substantial waste generation and environmental degradation. With global construction and demolition (C&D) waste expected to reach 2.2 billion tons in the next nine years, there is an urgent need to shift towards more sustainable approaches. This has prompted interest in the circular economy (CE), a regenerative model that emphasizes waste minimization and promotes the continuous use of resources through reuse, recycling, refurbishment, and innovative design. The current study aims to develop a comprehensive framework for implementing circular economy principles specifically within construction waste management. It seeks to identify key waste-generating materials and evaluate their potential for reintegration into the construction process. Focusing on strategies such as effective material sorting, reuse of construction components, and incorporation of recycled materials into new projects, the study highlights practical approaches to reduce environmental impact and enhance resource efficiency. Utilizing methods like questionnaire surveys, trend analysis, and stakeholder consultations, the research endeavors to formulate a strategic roadmap for CE adoption in the construction sector. Ultimately, it supports the transition towards a sustainable built environment characterized by reduced carbon emissions and a significantly lower ecological footprint.

**M. Gowsiga et al (2023)** globally, the building sector is a major contributor to environmental degradation, consuming nearly 40% of resources and producing a similar proportion of waste, along with contributing around 33% of greenhouse gas emissions. To address these challenges, the Circular Economy (CE) has emerged as a promising solution; however, its adoption in the building sector is complicated by the existence of multiple conceptual frameworks, notably the R-imperatives (or R-framework), CE loops, and the Resolve model, which present CE principles in varied ways. To bring clarity to this complexity, a systematic literature review was conducted using the PRISMA methodology to answer the research question: “What are the R-imperatives that are applicable for the building sector as CE principles?” This review analyzed 23 selected papers and concluded that, while various CE models exist, the R-imperatives offer the most practical and actionable principles for the building sector. The study identified 17 R-imperatives—ranked by their level of circularity—and provided clear definitions for each. Furthermore, these imperatives were logically connected with the principles found in the CE loops and Resolve model, thus creating a unified framework that can guide the effective implementation of circular economy strategies in the building sector by providing greater conceptual clarity and practical direction.

**A'izzatul Khiyana et al (2023)** building projects often generate large volumes of waste due to their reliance on a linear economic model characterized by the “take, make, dispose” approach, which emphasizes material consumption and discarding without considering long-term sustainability. This unsustainable practice leads to significant environmental and economic consequences, especially as materials used in construction are typically not recovered or repurposed at the end of a building’s life. To address this issue, the study explores the adoption of circular economy principles—namely reduce, reuse, recycle, recovery, and repair—to manage construction waste more effectively. By conducting field observations and interviews, the research identifies common types of waste in building projects, including steel reinforcement, ready-mix concrete, light brick, ceramic, multiplex, spun pile, and anchors. The study then proposes strategies to handle these materials through circular practices, demonstrating that a shift from linear to circular waste management not only benefits the environment but also yields significant cost savings. Specifically, the implementation of circular economy methods in three building projects—Project A, B, and C—resulted in cost savings of Rp. 68,252,490.65, Rp. 84,182,684.96, and Rp. 31,794,238.51 respectively, highlighting the financial advantages of sustainable construction waste handling.

**Siraj Ahmed et al (2022)** this study explores the benefits and challenges associated with implementing the circular economy (CE) in construction projects, with a particular focus on how procurement strategies influence CE adoption. Using a qualitative approach based on adductive reasoning, the researchers collected empirical data from the construction sector in the United Arab Emirates (UAE). The findings indicate that stakeholders—including clients, consultants, and contractors—generally possess limited awareness, knowledge, and motivation regarding CE practices. Key challenges identified include a lack of incentives to design projects in alignment with CE principles, minimal engagement of contractors and suppliers in early project stages, and the infrequent use of materials that support CE objectives. Furthermore, the current procurement strategies in place are not conducive to CE implementation, as they often fail to promote collaboration or long-term value creation. The study contributes novel insights into the underexplored intersection of CE and procurement strategies in construction, emphasizing that a shift toward more collaborative and partnering-based procurement methods could significantly enhance the adoption and success of CE in construction projects.

**Arnaud Diemer et al (2022)** the implementation of the circular economy in France's building and construction sector is shaped by a dynamic interplay between market-driven incentives and state regulation, with European and French legislation playing a pivotal role. This regulatory framework—comprising environmental laws, building codes, policy roadmaps, and EU directives—forms a normative arena that guides and constrains the actions of stakeholders while also responding to economic and environmental pressures. The efface case study exemplifies how businesses navigate this dual influence, adapting to evolving legislative demands while pursuing innovation. A literature review of both academic and gray sources highlights the necessary normative conditions to enhance circularity in the sector, identifying seven core principles, with a focus on four key areas: building lighter structures to reduce material consumption, minimizing waste in production processes, maximizing the use of floor space for efficiency, and extending the life of materials through reuse or recycling. The chapter ultimately argues that a normative, legally grounded approach provides a solid and compulsory foundation for establishing social consensus on sustainability objectives, upon which market-driven initiatives and technological innovations can build to create significant impact for stakeholders across the construction industry.

**Jaya Surya R et al (2021)** globally, approximately 30% of total solid waste originates from construction and demolition (C&D) activities, and in India, an estimated 150 million tons of C&D waste is generated annually, according to the Building Materials Promotion Council. However, a mere 1%—around 6,500 tons per day—is currently recycled, as reported by the Centre for Science and Environment, New Delhi. This alarming figure underscores a widening gap between the growing demand for construction materials and the dwindling availability of natural resources, resulting in market volatility and severe environmental degradation. The prevailing linear business model—characterized by a 'take-make-dispose' approach—encourages single-use practices that contribute significantly to the accumulation of C&D waste in landfills, a method that is neither efficient nor sustainable. In contrast, the adoption of circular business models (CBMs), which follow a closed-loop system of 'source-commodity-waste-new source', offers a viable solution to address resource scarcity and environmental concerns. CBMs promote reuse, recycling, and regeneration of materials, thereby reducing reliance on virgin resources and minimizing waste. This research aims to explore the implementation of CBMs in India's C&D waste management through an extensive literature review that gathers and analyzes data on relevant conceptual models, methods, and tools. The study emphasizes the socio-economic and environmental advantages of circular economy practices, including job creation, reduced emissions, and enhanced material efficiency. Ultimately, the paper concludes that formulating and enforcing stringent circular economy policies tailored to the Indian context is crucial to promoting the widespread adoption of CBMs in the construction sector, which in turn would mitigate resource depletion, reduce landfill pressure, and contribute significantly to sustainable development.

**Iuliia Plastinina et al (2019)** the circular economy emphasizes the efficient management and reuse of waste, transforming it into a resource to maximize its economic and environmental benefits. In Russia, where waste management is undergoing a comprehensive reform, identifying the most effective strategies is vital—especially considering the vast geographic and socio-economic diversity across its regions. This study focuses on municipal solid waste (MSW) management in Sverdlovskaya Oblast, using it as a representative case to illustrate challenges and progress during the initial phase of reforms. The analysis includes a review of current and proposed regulatory frameworks at both regional and federal levels, legislative changes, and institutional mechanisms guiding the sector. By applying the index method, the researchers assessed the development stage of the circular economy in the region, while life cycle analysis (LCA) was employed to evaluate the economic viability of waste paper recycling across its various stages, accounting for environmental externalities. The findings revealed that although recycling waste paper holds significant economic potential, the region's circular economy remains underdeveloped, hindered by several regional-specific barriers. However, enabling factors were also identified, providing insights into how governance quality and regulatory implementation can be improved. Based on these results, the study offers practical recommendations to enhance the effectiveness of municipal solid waste management and foster circular economy principles more broadly across Russian territories.

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## Methodology

This review study adopts a qualitative research approach using a systematic literature review (SLR) method to evaluate and synthesize existing academic and industry-based research on the socio-economic and environmental benefits of the circular economy (CE). The methodology consists of the following key stages.

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## Research Design

The study is designed as a thematic literature review, focusing on identifying, classifying, and analyzing peer-reviewed academic papers, industry reports, policy documents, and case studies related to circular economy practices. The review investigates how CE contributes to:

- ❖ Socio-economic advantages such as job creation, innovation, economic growth, and social inclusion.
- ❖ Environmental advantages such as waste reduction, lower carbon emissions, conservation of natural resources, and improved ecological balance

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## Data Selection and Screening

An initial screening of over 150 publications was conducted by reading titles and abstracts. After applying the inclusion/exclusion criteria, approximately 60 relevant sources were selected for full-text review. A PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) flow diagram was used to maintain transparency in selection and filtering of articles.

## Limitations

- ❖ The review is limited to literature published in English, potentially excluding relevant studies in other languages.
- ❖ The scope may be biased towards European and developed countries due to the availability of more documented CE initiatives.
- ❖ The study relies primarily on secondary data; therefore, original field-based case studies were not conducted.

## Conclusion

The transition to a circular economy presents a transformative opportunity to address some of the most pressing socio-economic and environmental challenges facing the world today. By moving away from the traditional linear model of “take, make, and dispose” and embracing the principles of reuse, recycling, resource efficiency, and regeneration, the circular economy fosters sustainable development and long-term resilience.

From a socio-economic perspective, circular practices can create new job opportunities, stimulate innovation, support local industries, and reduce economic dependency on finite resources. These practices also encourage responsible consumption and production patterns, enhancing community well-being and social equity.

On the environmental front, circular economy strategies significantly reduce waste generation, lower greenhouse gas emissions, minimize resource extraction, and preserve biodiversity. By extending the life cycle of materials and products, they contribute to a more sustainable and regenerative system that aligns with climate goals and environmental preservation.

In conclusion, the circular economy is not just a sustainability model but a comprehensive framework that integrates economic growth with environmental stewardship and social responsibility. Its adoption across industries, particularly in construction, manufacturing, and urban development, is essential for building a more inclusive, resilient, and sustainable future.

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