

The role of circular economy in supporting sustainable development goals (SDGs) in Indonesia from an Islamic economic perspective

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ABSTRACT

Introduction

Human life is currently in a critical situation regarding environmental awareness. Discussions on sustainable development have become a key topic in building sustainable SDGs to achieve environmental preservation. Sustainable development is a crucial benchmark of environmental conservation.

Objectives

This study aims to explain how the use of circular economy strategies can achieve sustainable development goals in line with the SDGs from an Islamic economic perspective.

Method

This study employed a qualitative literature review method. Secondary data sources, such as books, scientific journals, and previous articles, form the basis for analyzing various issues related to circular economy strategies and sustainable development.

Results

The findings indicate that the circular economy plays an important role in supporting sustainable development goals in Indonesia, particularly in achieving SDG goal number 8, which aims for sustainable, inclusive economic growth and the creation of decent work for all. Additionally, the circular economy is closely related to achieving SDG goal number 12, which ensures sustainable consumption and production patterns. Islamic economics plays a crucial role in supporting the implementation of SDGs in Indonesia by involving various products and ecosystems, including Sharia-compliant financial products, halal food and beverages, Islamic entrepreneurs, and the circular economy related to resource utilization.

Implications

The results highlight the importance of the circular economy as a strategic approach for addressing environmental challenges and achieving long-term sustainability. The integration of Islamic economic principles offers a robust framework to promote ethical and responsible resource management.

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ABSTRACT**Originality/Novelty**

This study provides a unique perspective by combining the concepts of circular economy and Islamic economics to explore their combined impact on achieving sustainable development goals. This contributes to a broader understanding of how cultural and religious principles can enhance sustainability.

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INTRODUCTION

Today, human life is in a critical situation in terms of environmental awareness. Economic development is progressing rapidly and consumerism is rising without being accompanied by an awareness of environmental protection (Rahman, 2020). The culture of consumerism drives uncontrolled human consumption behavior, which producers take advantage of as an opportunity to maximize their profits. However, many businesses have failed to consider the environmental aspects of their operations (Fellner & Goehmann, 2020). This has resulted in ozone layer depletion and extreme climate change phenomena that are currently experiencing (Masrurah & Fardian, 2022).

Climate change is marked by shifting global climate patterns that lead to unpredictable weather phenomena (Mutmainnah & Romadhon, 2023). This condition is influenced by changes in climatic components, including temperature, rainfall, humidity, wind, and clouds. Various human activities, such as fossil fuel combustion and land-use changes, can increase greenhouse gas emissions (CO₂, CH₄, CHL, N₂O, SF₆, and HFCs), contributing to global temperature rise, ice sheet melting at the poles, sea level rise, and altered rainfall patterns (Rahmayanti & Ilyasa, 2022).

The concept of sustainable development goals has emerged as an idea to provide solutions to climate change and environmental conservation. Sustainable development simultaneously addresses three dimensions: economic, social, and environmental (Coscieme et al., 2021; Mutmainnah & Romadhon, 2023). The sustainable development strategy framework is designed to outline the business planning process, including guiding the transition from traditional linear to circular production functions (Hondroyannis et al., 2023). Sustainable development serves as an essential benchmark for environmental conservation. Well-executed sustainable development is generally marked by continuous development aimed at maintaining quality of life (Dumitrescu et al., 2013; Vlek et al., 1998).

Sustainable development is a crucial aspect, especially in Indonesia, and through sustainable development, the country can implement and adopt sustainable economic principles. The effective implementation of sustainable development can be achieved through various methods, with the circular economy being one of the

approaches (Fandira et al., 2023; Latif, 2022). Economic, social, and environmental factors have shifted the perception of the circular economy from a well-intended marginal model to a viable and important alternative to current linear practices, which are then reconsidered dominant (Manik, 2022).

Indonesia is the fourth most populous country in the world, with around 264 million people, and faces significant challenges in managing its waste volume. Data on waste management in the country show that out of 265 districts/cities, 26 million tons of waste is collected annually. Of this total, approximately 22.74% has been reduced and 52.61% has been processed through existing waste management efforts. In general, 75.25% of this waste has been effectively managed, but 24.75% has not been properly managed (Islami, 2022).

Such a volume of waste has become one of Indonesia's problems that must be addressed immediately to prevent further increases in waste volume and the negative impacts it brings. Moreover, if improper waste disposal continues without efforts to reduce waste, it will have long-term damaging effects on the environment. Therefore, it is essential for the government to take firm action to address waste issues by implementing a circular economy. This is intended to ensure that the goals of sustainable development are achieved (Fandira et al., 2023).

In addition to the government, the public is obliged to protect the environment. Islam, as a comprehensive and perfect religion, pays great attention to every aspect of human life and offers guidance on various issues related to individual and social needs. The environment is an important issue emphasized in Islamic teaching. The Holy Qur'an, Surah Ar-Rum Verse 41 explains that corruption on land and at sea is a result of human actions. In Islamic teachings, humans were created not only to worship Allah, but also given the role of stewards of the Earth. It is the responsibility of humans to use and care for the environment (Baharuddin & Musa, 2015; Hasan, 2022).

The circular economy model is an economic concept introduced to the public as a solution for managing waste and protecting the environment. Circular economy is an innovative approach designed to optimize material cycles by minimizing, streamlining, and slowing material flow. The goal is to create positive impacts on the economy, environment, and society as a step towards sustainability (Ghisellini et al., 2018; Murray et al., 2017). The circular economy concept is considered an effective solution to address today's environmental challenges, including resource shortages, land degradation, improper waste management, unsustainable water use, and energy waste (Hondroyiannis et al., 2023).

The implementation of a circular economy in Indonesia is linked to the efficient and effective suboptimal use of natural resources and ecosystems (Latif, 2022). The circular economy concept refers to the unification of economic activities and environmental sustainability, particularly concerning waste (Korhonen et al., 2018; Valavanidis, 2018; Winans et al., 2017). Therefore, the government must take decisive steps to tackle waste issues by adopting a circular economy to ensure the achievement of sustainable development goals.

Several studies discussing the circular economy have been conducted at both global and domestic levels. Iskandar & Aqbar (2019) explain that the application of a circular economy has the potential to provide significant future benefits in the economic, environmental, and social fields. By applying circular economy principles, society can enhance environmental sustainability, improve societal well-being, minimize environmental damage, add value to new products, and simultaneously drive green economic growth in alignment with development goals. According to Fandira et al. (2023), one strategy contributing to the Sustainable Development Goals (SDGs) and sustainable development is the circular economy. Indonesia has adopted a circular economy in recent years. The main principle of the circular economy is to minimize the use of raw materials and resources while ensuring that products remain useful for as long as possible. This demonstrates that a circular economy offers innovative solutions to address environmental issues, particularly those related to waste and waste management. The circular economy aligns with Islamic economics, as its implementation is consistent with Islamic teaching.

Based on the above background, the aim of this research is to explain how the use of circular economy strategies can achieve Sustainable Development Goals (SDGs) in line with the Sustainable Development Goals (SDGs) from an Islamic perspective. This research is important both theoretically and practically. Theoretically, this study adds to the understanding of the potential of the circular economy as a solution for achieving sustainable development goals in Indonesia. Practically, the results of this research can provide recommendations to the government and related institutions to implement a circular economy as a primary strategy for reducing waste. Considering the background presented, the research question in this study is "How can the implementation of a circular economy become a strategy to achieve sustainable development goals from the perspective of Islamic economics?".

LITERATURE REVIEW

According to the United Nations (UN), Sustainable Development Goals (SDGs) are defined as developments that ensure the fulfillment of the current generation's needs without compromising the ability of future generations to meet their own needs (Pizzi et al., 2020). In a broader context, sustainable development is interpreted as a nation's efforts to achieve a development model oriented towards improving quality of life. In a more specific context, this concept can be traced back to Hicks' thinking regarding the definition of income (Afiah et al., 2024; Moffatt et al., 2013; Venkatachalam, 2016).

In 2015, the United Nations (UN) launched the Sustainable Development Goals (SDGs), which include 17 main goals, 169 specific targets, and 231 performance indicators. The SDGs were designed to promote worldwide sustainability by 2030. The SDGs framework is recognized as the most comprehensive initiative ever developed to address the major challenges faced by the international community. The Environmental, Social, and Governance (ESG) framework includes components related to achieving Sustainable Development Goals (SDGs) (Andries et al., 2019; Hegre et al.,

2020). Sustainable Development Goals encompass the following (Kementerian Perencanaan Pembangunan Nasional/Bappenas, 2023):

1. No poverty
2. Zero hunger
3. Good health and well-being
4. Quality education
5. Gender equality
6. Clean water and sanitation
7. Affordable and clean energy
8. Decent work and economic growth
9. Industry, innovation, and infrastructure
10. Reduced inequalities
11. Sustainable cities and communities
12. Responsible consumption and production
13. Climate action
14. Life below water
15. Life on land
16. Peace, justice, and strong institutions
17. Partnerships for the goals

The 17 Sustainable Development Goals (SDGs) represent a global and national agreement aimed at improving society's well-being. Indonesia is targeting the achievement of all sustainable development goals by 2030. Efforts from all parties are necessary to ensure that these goals are maximally realized.

METHOD

The methodology used in this study was qualitative, adopting a literature review technique (Ridley, 2012). A literature review is a research method that emphasizes the analysis, synthesis, and evaluation of literature or written documents relevant to the research subject, in which the data collection process is conducted in detail and thoroughly (Sekaran & Bougie, 2016). This study was conducted by selecting and reviewing various sources of information, such as journals, books, and other documents, available in both print and digital formats. Unlike primary data collection through surveys or interviews, this method focuses on the content analysis of existing scientific literature (Yulianti et al., 2023). This research aims to explain how the concept of a circular economy contributes to efforts to achieve sustainable development. Secondary data sources, such as books, scientific journals, and previous articles, serve as the basis for analyzing various issues related to circular economy strategies and sustainable development. The main focus of this study is to understand the role of the circular economy concept in supporting sustainable development.

The data analysis was conducted in three main steps. First, data reduction occurs when available data are selected and simplified. In the context of this research, this was achieved by filtering several relevant journals on the topic discussed by the

authors, and then summarizing the content of these journals on the circular economy into simpler sentences with the goal of organizing the data. Second, data are presented, where all simplified information is arranged in such a way as to facilitate drawing conclusions and planning actions. The final step draws conclusions from the research results, where all the information collected and organized is analyzed to obtain the main conclusions ([Creswell & Creswell, 2018](#)).

RESULTS AND DISCUSSION

Circular Economy

The circular economy can be defined as an industrial system deliberately designed to be restorative or regenerative. This means shifting the idea of a product's end to the concept of restoration, transitioning to the use of renewable energy, eliminating harmful chemicals, facilitating reuse, and aiming to eliminate waste through innovative design of materials, products, systems, and business models. Its main goal is to optimize the circulation of materials, energy, labor, and information to support the recovery and growth of natural and social capital ([Ellen MacArthur Foundation, 2013](#)).

The circular economy is a development strategy that integrates various techniques to create and preserve value through recycling practices, waste minimization, reuse, and regeneration. It supports innovation in material transformation to facilitate the separation and reuse of materials after consumption, as part of a sustainability-oriented design approach ([Hondroyiannis et al., 2023](#)).

This initiative aims to create sustainability by minimizing, optimizing, and slowing material cycles, thereby contributing to economic growth, environmental enhancement, and social well-being. By adopting the circular economy model, we can address current environmental challenges, such as resource limitations, land degradation, ineffective waste management, unsustainable water use, and energy waste ([Su et al., 2013](#)).

The circular economic cycle illustrates a series of processes that prioritize the sustainable use of resources in an economic context. This cycle involves several interconnected stages, including resource extraction, processing, usage, and recovery, which are explained as follows ([Hagelüken & Goldmann, 2022](#); [Kirchherr et al., 2023](#); [Vogiantzi & Tserpes, 2023](#)).

a. Resource Extraction

The initial stage of the circular economy cycle involves the extraction of resources from the environment. This includes various types of raw materials such as minerals, metals, biomass, and energy. The circular economy approach aims to optimize the use of natural resources by considering factors such as availability, sustainability, and environmental impact.

b. Production and Processing

After resource extraction, the next step is the production and processing of the materials into ready-to-use products. At this stage, the principles of circular economy are adopted, including designing recyclable products, utilizing recycled materials,

applying renewable energy, and using environmentally friendly technologies. The goal was to reduce waste and enhance resource efficiency.

c. Usage and Consumption

After the production process, the next stage is the usage and consumption by end users. In the context of a circular economy, the focus is on extending the product's lifespan as much as possible through practices such as maintenance, repair, and shared usage. This approach aims to reduce waste and the need for new production processes.

d. Recovery and Recycling

Once a product reaches the end of its useful life, the final step in the circular economy cycle is to return materials and components from unused products back into the economic cycle. This process includes recycling practices, reuse, energy recovery, and waste processing, with the goal of reducing the environmental impact and maximizing the value of reusable materials.

Circular Economy in Indonesia

As one of the most densely populated countries in the world, Indonesia faces environmental challenges due to poorly managed waste accumulation, particularly plastic waste. Therefore, an integrated approach is required to address Indonesian waste problems. The circular economy approach is considered the most appropriate solution because it strongly correlates with the achievement of Sustainable Development Goals (SDGs) (Fandira et al., 2023). The United Nations promote Sustainable Development Goals (SDGs) to ensure the fulfillment of the current generation's needs without compromising the ability of future generations to meet their own needs (Guerra et al., 2022; Hajian & Kashani, 2021; Sparviero & Ragnedda, 2021).

Indonesia has applied the principles of the circular economy to five priority sectors, including food and beverages, construction, electronics, textiles, and plastics. Predictions indicate that the implementation of these principles in these five sectors has the potential to reduce CO₂ emissions by 11-15% by 2030, if applied consistently. Some circular economy policies in Indonesia initiated by ministries and government agencies include the following (Kementerian Perencanaan Pembangunan Nasional/Bappenas, 2022):

1. Green Industry Standards (GIS): These cover various aspects, including energy efficiency, waste management, use of more sustainable raw materials, pollution prevention, and development of environmentally friendly products.
2. Roadmaps for Waste Reduction by Producers: Manufacturers, retailers, and food and beverage service industries are required to reduce the amount of waste by 30% by 2029 through waste prevention, recycling, and reuse.
3. Green Building Policy: This regulation relates to the construction of an environmentally friendly infrastructure aimed at reducing the amount of carbon emissions produced by the construction sector.

Sustainable Development from the Perspective of Islamic Economics

Islam introduces a vision of sustainable development based on the application of Islamic economic principles and the renewal of traditional institutions that govern resource use, according to Islamic views (Mursid et al., 2024; Pandikar et al., 2022; Zauro et al., 2024). As part of the implementation of the Islamic economic system in the context of sustainable development, the foundation of Islamic ecological ethics is proposed. This concept offers a deep perspective on how Islamic economics views the interactions between humans and the environment. Islamic Ecological Ethics convey core principles that must be strictly followed, as well as behaviors that should be avoided to prevent disharmony between humans and nature. Two fundamental principles in Islamic Ecological Ethics are *at-tauhid*, which refers to the recognition of the oneness of Allah, and *al-khilafah*, which emphasizes the role of humans as Allah's representatives on Earth. Designing this model should be based on the principles of Islamic ecological ethics that align with the socio-cultural values of Indonesian society and already have a clear legal foundation (Muhtadi et al., 2019).

From Islamic perspective on Sustainable Development Goals (SDGs), it is believed that humans and ethics are the main factors driving the achievement of these goals. In the context of Muslim society, Islam serves as the foundation of ethical and moral leadership. Therefore, it is important to elaborate on how Islam views and contributes to sustainable development. This pertains to morals, ethics, and values in accordance with Islamic teachings (Ali & Agushi, 2024; Rahim, 2013; Zailani, 2024). Islamic economics play an essential role in supporting the implementation of SDGs in Indonesia by involving various existing products and ecosystems. This includes sharia-compliant financial products, halal foods and beverages, Islamic entrepreneurs, and a circular economy related to resource utilization (Dirie et al., 2023; Harahap et al., 2023; Hibatullah et al., 2023).

The Role of Circular Economy in Supporting Sustainable Development Goals in Indonesia

Waste is currently one of the main problems faced by society as it has the potential to affect environmental quality. One of the causes of increasing waste volume is that over time, people prefer convenience, and products used once often end up as waste. Technological advancements that simplify human tasks have supported this trend, resulting in many positive outcomes. However, one of the unavoidable negative impacts is the waste generated (Areche et al., 2022; Coker, 2018). Therefore, both central and local governments, as organizers and regulators, are determined to implement practical policy strategies to address this issue effectively.

Sustainable development is essentially a governmental effort to preserve Indonesia's rich resources for future generations (Arifin et al., 2024; Kunarto & Prasetyo, 2022). Sustainable development was created as an effort to solve environmental problems, particularly concerning the quality of the environment and future

sustainability of human life. Additionally, sustainable development is crucial for maintaining food availability, which is a fundamental necessity for human survival.

Sustainable development policies not only aim to ensure human welfare but also to maintain the balance of nature as a form of environmental sustainability. Therefore, as partners in development, it is essential for central and local governments to work together and provide directions to preserve and sustain environmental functions (Listiawati, 2013).

One strategy the government can implement is the concept of a circular economy. The Indonesian government supports this strategy, as reflected in the narrative of the National Medium-Term Development Plan (RPJMN) 2020–2024, which highlights waste management planning and green industry development. According to a Ministry of National Development Planning/National Development Planning Agency (PPN/Bappenas) report, there are five focus areas for circular economy implementation in Indonesia: food and beverages (including packaging), textiles, garments, construction services, plastics, and electronics. The application of the circular economy concept in Indonesia is also supported by Presidential Regulation Number 97 of 2017 on waste management, which includes household and similar waste types. A similar policy is outlined in Presidential Regulation Number 83 of 2018 on Marine Waste Management, covering strategies for managing land, coastal, and marine waste, along with monitoring and law enforcement.

According to the National Waste Management Information System (SIPSN), waste data from 265 cities/regencies across Indonesia in 2022 are presented in Table 1. It can be concluded that waste management in Indonesia has not been fully optimized. The concept of a circular economy is closely related to sustainable development (Khairina et al., 2020). The circular economy marks progress in sustainable development by reusing the waste generated from consumption and production (Kamysnikov et al., 2021; Ma et al., 2021; Zvarych & Kril, 2021).

Table 1

Waste Data from 265 Cities/Regencies in Indonesia

No	Waste Data Input	Amount (tons/year)
1	Waste Generated	28,788,895.10
2	Waste Reduction	4,319,907.59
3	Waste Treatment	14,148,589.29
4	Managed Waste	18,468,496.88
5	Unmanaged Waste	10,320,398.22

Source: National Waste Management Information System, 2022.

The circular economy approach is an appropriate strategy for achieving the Sustainable Development Goals (SDGs). The circular economy aims to reduce the use of materials and resources and encourage products to have longer lifespans. This approach has a significant impact on achieving SDG Goal 8, which aims to promote sustained, inclusive, and sustainable economic growth and create decent work for all (Fandira et al., 2023).

A circular economy can create new job opportunities in sectors such as recycling, repair, and green technology. Additionally, the circular economy is closely linked to the achievement of SDG Goal 12, which aims to ensure sustainable consumption and production. Implementing recycling, recovery, and reuse practices helps to reduce negative environmental impacts and promotes more responsible consumption patterns (Kurnia et al., 2023). Thus, it is hoped that a circular economy will become the main approach to addressing waste problems in Indonesia. This is due to the fact that the circular economy has concrete objectives, and its results will be evident if implemented consistently and responsibly.

CONCLUSION

With Indonesia's large population, the volume of waste in the country is increasing. This waste has a negative impact on the environment and sustainable development. Sustainable development is a crucial aspect, especially for Indonesia, because the country can implement and adopt sustainable economic principles through sustainable development. Therefore, governments must implement various methods or programs to address waste or pollution issues. A strategy for sustainable development is the concept of a circular economy.

The circular economy aims to reduce the use of materials and resources and encourage products with longer lifespans. This approach has a significant impact on achieving SDG Goal 8, which aims to promote sustained, inclusive, and sustainable economic growth and create decent jobs for all. Additionally, the circular economy is closely linked to achieving SDG Goal 12, which aims to ensure sustainable consumption and production patterns. Applying practices such as recycling, recovery, and reuse helps reduce negative environmental impacts and promotes more responsible consumption patterns.

Islamic economics plays an important role in supporting the implementation of the SDGs in Indonesia by involving various existing products and ecosystems. These include sharia-compliant financial products, halal food and beverages, Islamic entrepreneurs, and a circular economy related to resource utilization for future life.

Limitation of the Study

Nonetheless, this study has numerous limitations. This study mostly relies on data derived from public literature and governmental reports. These sources may not accurately represent the latest advances or developing trends in the implementation of a circular economy in Indonesia. The utilization of literature reviews as the principal research approach constrains the capacity to gather data directly from stakeholders engaged in waste management or circular economy initiatives, thereby diminishing the probability of acquiring insights directly from such stakeholders. Hence, the findings may not fully represent the latest issues present in the real world or the most recent developments in legislation or methodology.

Although the study references the economics concerning the Sustainable Development Goals (SDGs), it fails to undertake a comprehensive examination of the

issues that may hinder the practical implementation of these strategies across different sectors in Indonesia. To effectively execute circular economy initiatives, it is essential to address various factors, including infrastructure restrictions and challenges presented by regulatory bodies. Furthermore, the research failed to examine how these components vary in places or industries that have difficulties in implementing sustainable practices.

In summary, this research lacks tangible examples or case studies demonstrating the implementation and effects of the circular economy in Indonesia. This complicates the assessment of the efficacy of the proposed methods and validation of the circular economy's benefits for sustainability, as there are no examples or tangible results to support the evaluation. To attain a comprehensive understanding of the obstacles and opportunities related to the implementation of a circular economy in Indonesia, it is advantageous to conduct more research involving stakeholder discussions, on-site data collection, and case studies.

Recommendations for Further Research

Further research should be conducted to collect primary data from stakeholders directly involved in implementing the circular economy in Indonesia. This can be achieved by conducting interviews, surveys, or field studies in various industries that have adopted the circular economy concept. By collecting this primary data, researchers can gain a better understanding of the operational challenges and problems faced in the field. This will also help to assess the effectiveness of government policies.

Future research should consider specific issues that may hinder the widespread adoption of a circular economy. To understand why the implementation of the circular economy has not been successful in some regions, further research needs to be conducted on issues such as regulatory challenges, infrastructure limitations, and a lack of funding. This analysis is important to help the government and other stakeholders make more targeted plans, such as providing incentives to industries or regions that need support to implement the circular economy.

Finally, we hope that further research will include case studies or specific examples of industries or regions that have implemented a circular economy well. These case studies provide a clearer picture of the best practices that can be applied to other industries or regions. Therefore, this research is more practically relevant and can be used as a guide by policymakers and industry players to decide how to implement a circular economy.

Author Contributions

Conceptualization	I.N., A.R., & K.M.	Resources	I.N., A.R., & K.M.
Data curation	I.N., A.R., & K.M.	Software	I.N., A.R., & K.M.
Formal analysis	I.N., A.R., & K.M.	Supervision	I.N., A.R., & K.M.
Funding acquisition	I.N., A.R., & K.M.	Validation	I.N., A.R., & K.M.
Investigation	I.N., A.R., & K.M.	Visualization	I.N., A.R., & K.M.
Methodology	I.N., A.R., & K.M.	Writing – original draft	I.N., A.R., & K.M.
Project administration	I.N., A.R., & K.M.	Writing – review &	I.N., A.R., & K.M.

All authors have read and agreed to the published version of the manuscript.

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Informed Consent Statement

Informed consent was not required for this study.

Data Availability Statement

The data presented in this study are available on request from the corresponding author.

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Conflicts of Interest

The authors declare no conflicts of interest.

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