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Analysis of the Green Economy Framework for the Sustainability of the Halal Industry in Makassar

Desy Rahmawati Anwar[1*], Siradjuddin[2], Rahmawati Muin[3]
[1]Pelita Buana College of Economics
[2,3]Postgraduate Program, Alauddin State Islamic University Makassar
Corresponding Author: Desy Rahmawati Anwar
desyrahmawatianwar@gmail.com

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A B S T R A C T
The halal industry is one of the strategic sectors in the national economy that has great potential to develop sustainably. However, the growth of this industry needs to be aligned with environmentally friendly principles as global demands for sustainable business practices increase. This study aims to analyze how the Green economy framework can be integrated into the sustainability strategy of the halal industry in Makassar City. Using a descriptive qualitative approach, data were collected through in-depth interviews, field observations, and literature studies of halal industry players and related stakeholders. The results of the study indicate that some industry players have implemented green practices such as waste reduction, use of renewable energy, and raw material efficiency. However, the adoption of Green economy principles has not been evenly distributed due to limited resources, conceptual understanding, and policy support. This study concludes that the integration of Green economy in halal industry management not only improves operational efficiency and product competitiveness, but also strengthens the social legitimacy and ethical added value of halal products.

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INTRODUCTION

The halal industry is one of the fastest growing sectors globally, driven by increasing awareness among Muslim consumers of the importance of halal products and demand for goods and services that meet ethical and sustainable standards. Indonesia, as the country with the largest Muslim population in the world, has a strategic position in the development of the halal industry, both for domestic needs and export (Yusoff et al., 2021). Makassar City, as an economic center in eastern Indonesia, shows significant growth in the halal industry sector, especially in the food, beverage, and cosmetics sectors. The development of this halal industry still faces serious challenges related to environmental sustainability. Environmentally unfriendly production activities, inefficient use of resources, and minimal waste management have the potential to harm the principle of thayyib in the halal concept, which emphasizes goodness and cleanliness as a whole (Zainal Abidin et al., 2020). In this context, the Green economy framework becomes relevant to be applied as a strategic approach to support the sustainability of the halal industry.

Green economy is a development model that balances economic growth with environmental protection and improving social welfare. This model encourages energy efficiency, waste recycling, use of renewable resources, and environmentally friendly production patterns (UNEP, 2020). Several previous studies have discussed the importance of sustainability in the halal industry (Ahmad et al., 2019), but the integration of the Green economy concept into the halal industry management system, especially in a local context such as Makassar, is still rarely studied. The knowledge gap lies in the lack of empirical studies that systematically analyze how Green economy principles can be adopted by halal industry players to strengthen operational and environmental sustainability. In addition, there is no integrated conceptual framework that can be used as a reference in the practical application of Green economy in halal industry management.

This study significantly contributes to the understanding of how the Green economy framework can be applied to improve the sustainability of the halal industry in Makassar. This study also introduces the concept of green technology innovation as a driving factor in improving operational efficiency and lower environmental impact in the halal industry. Furthermore, the results of this study provide new insights for policies and practices in the environmentally friendly halal industry in Indonesia.

LITERATURE REVIEW

Green Economy Concept and Its Application

Green Economy is an approach to economic development that focuses on sustainable growth while taking into account environmental and social aspects. According to the United Nations Environment Programme (UNEP), Green Economy is defined as "an economy that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities" (UNEP, 2024). The concept is gaining more global attention. For example, in the UK, the net-zero economy is set to grow by 9% by 2023, compared to just 0.1% national economic growth. It generates £74 billion and

creates over 765,000 jobs, as well as supporting the transformation of post-industrial areas (Carrington, 2024).

Countries like Bhutan have also harnessed abundant hydropower to drive economic growth through green crypto mining, an initiative that balances technology and sustainability (Reuters, 2025). Several studies have shown that implementing Green economy principles can improve industrial competitiveness, particularly through reduced energy costs and waste (Yusoff et al., 2021). However, the implementation of this concept in developing countries is often hampered by a lack of understanding, technology, and policy incentives (Muhammad et al., 2022).

According to Chuprina et al. (2024) emphasize that the Green Economy is an "important vector" in modern sustainable development. They state the importance of establishing conceptual and methodological approaches that allow for the real and systematic implementation of the green economy. This includes environmentally friendly fiscal policies, green investments, and technological innovation in industrial processes. In line with this, Xu et al. (2022) state that the Green Economy and green growth are now not just jargon, but have become practical operational strategies to achieve the Sustainable Development Goals (SDGs). In this framework, economic growth is directed so as not to damage the environment, but rather to strengthen the long-term ecological foundation. According to Sultana et al. (2025) show that innovation based on artificial intelligence (AI), digitalization of the economy, and renewable energy play an important role in reducing carbon emissions. Their study shows that countries that combine technology and energy efficiency experience significant reductions in CO_2, and accelerate the transition to a net-zero economy.

Halal Industry and Sustainability Dimension

The halal industry traditionally focuses on the sharia legality aspect of products. However, in recent years, there has been an awareness of the importance of the thayyib or goodness aspect which includes ethical, social, and environmental dimensions (Zainal Abidin et al., 2020). This has led to demands to make the halal industry not only legally halal, but also environmentally and socially sustainable. Ahmad et al. (2019) emphasize the importance of integrating sustainability principles into the halal management system, especially in the halal supply chain. However, this study has not specifically linked the concept of Green economy as a strategic framework that supports this sustainability.

Integration of Green Economy in Halal Industry

Literature discussing the integration of Green economy into the halal industry is still very limited. Research by Muhammad et al. (2022) formulated a circular economy framework in the context of the halal industry, emphasizing the importance of recycling, energy efficiency, and waste minimization. However, the study is more conceptual and has not explored much of the local context in Indonesia, especially in developing cities such as Makassar. Controversy has also arisen regarding the perception that environmental management in the halal industry is considered a secondary issue compared to sharia compliance (Yusoff et al., 2021). This creates a gap between the demands

of the global market which are increasingly moving towards sustainability and the readiness of the local halal industry to meet these demands.

Research Gaps and Contributions of This Study

Based on the existing literature, there are several important gaps: The lack of empirical studies assessing the level of adoption of Green economy principles in halal industry practices at the local level. The absence of an integrative framework that combines Green economy principles into the strategic management of the halal industry. Lack of attention to local contextual factors such as policy support, business culture, and technological readiness in implementing Green economy in the halal sector. This study contributes to filling these gaps by providing empirical analysis based on field data in Makassar City, as well as developing a conceptual framework for integrating Green economy into the halal industry. The results of this study are expected to enrich the literature on halal industry management with a sustainability perspective and become a reference for environmentally friendly halal industry development policies.

METHODOLOGY

This study uses a descriptive qualitative approach with the aim of exploring in depth how the Green economy framework is applied in the halal industry in Makassar City. This approach was chosen to understand the phenomenon from the perspective of industry players and related stakeholders in the local social and environmental context. This study also aims to formulate a conceptual framework that can be used in the development of a sustainable halal industry. Participants in this study consisted of: Halal industry players (owners of certified halal food, beverage, and cosmetic businesses), Representatives from local government agencies (Industry and Trade Service, Environmental Service), Academics and halal experts, Halal certification institutions. The number of participants was 15 people, selected by purposive sampling with the following criteria: Actively involved in the halal industry or related policy making, Have an understanding and experience in implementing the principles of sustainability or Green economy, Willing to be interviewed in depth.

Data collection was conducted using: Semi-structured interviews, to explore participants' views and practices related to the implementation of Green economy in the halal industry. Direct observation, conducted at several business locations to see the implementation of sustainability principles. Documentation, in the form of secondary data such as government reports, regulations, and halal certification documents as well as company environmental reports.

Data Collection Procedure Preparation Stage: Researchers prepared interview guidelines based on related literature and conducted a trial on two participants to validate the instrument. Implementation Stage: Interviews were conducted directly (face-to-face) or online (if necessary), with a duration of 45–60 minutes per participant. Observation and Documentation Stage: Conducted simultaneously or after the interview, by recording production and waste

management practices and supporting documents. Research Ethics: All participants signed a consent form, and their identities were kept confidential.

Data Analysis Techniques: Data were analyzed using thematic analysis based on the following steps (Braun & Clarke, 2006): Data familiarization: Interview transcripts and observation notes were read repeatedly. Initial coding: Identifying keywords and important concepts from the data. Theme search: Grouping codes into key themes such as energy efficiency, waste management, perceptions of sustainability, policy support. Theme review: Validating themes against raw data. Theme definition and naming: Themes were named and their context explained. Report preparation: Interpretation and synthesis of results according to the research focus.

RESEARCH RESULT AND DISCUSSION

Potential for Implementing the Green Economy Framework in the Makassar Halal Industry

Makassar as one of the metropolitan cities in eastern Indonesia has great potential in the development of the halal industry, especially in the food and beverage, cosmetics, and Muslim fashion sectors. Based on the research results, the majority of industry players have understood the importance of product halalness, but the application of sustainability and Green economy principles is still minimal and sporadic. The Green economy framework, which includes resource efficiency, waste reduction, and the use of renewable energy, has the potential to drive the transformation of Makassar's halal industry towards being more competitive and globally competitive (Yusoff et al., 2021). Some of the main challenges identified in Makassar are:

a. Lack of understanding and technical capacity of small and medium enterprises (SMEs) about green practices. Many actors do not yet understand that waste reduction and energy efficiency also have economic value (Muhammad et al., 2022).
b. High initial costs for the green transition, such as investing in environmentally friendly equipment or solar energy systems, which are beyond the reach of most MSMEs.
c. Limited regulatory support**,** where local government policies have not fully encouraged ecologically sustainable halal industry practices.
d. Local business culture is still predominantly oriented towards short-term cost efficiency**.**, not on long-term resource efficiency.

Despite significant challenges, the opportunities for Green economy integration are enormous, including:

a. Potential of local biomass and organic waste from agricultural and fishery products that can be developed as raw materials for bioenergy or environmentally friendly packaging materials.
b. Support for the global halal market which increasingly demands halal products that are not only lawful according to Islamic law but also sustainable (halal-thayyib).
c. Development of a community-based green economy ecosystem, such as halal home industries that use natural materials and recycling-based production systems.

Integration of Green Economy Principles in the Halal Industry Value Chain

Integration of green principles can be applied at several stages of the Makassar halal industry value chain:

Value Chain Stages	Recommended Green Practices
Procurement of Raw Materials	Use of local organic materials, recycling of agricultural/fishery waste
Production	Energy efficiency, use of low emission technology, liquid and solid waste processing
Packaging	Biodegradable or recycled materials
Distribution	Use of electric vehicles or integrated logistics systems
Consumption	Consumer education about halal-thayyib products and packaging recycling

Based on the results and analysis, some strategic recommendations to encourage the transition to a sustainable halal industry in Makassar are:

a. Preparation of green incentive policies by local governments, for example through tax reductions or environmentally friendly technology subsidies for certified halal industry players.
b. Integrated technical training on green and halal-thayyib production practices for MSMEs.
c. Establishment of a green halal innovation center that acts as an incubator for product innovation and sustainable production processes.
d. Partnership with academics and environmental NGOs to assist the halal industry transition process.
e. Consumer awareness campaign about the importance of choosing halal products that are also environmentally friendly.

Multidimensional Impact Evaluation of Green Economy Framework Implementation

Economic Impact

The implementation of Green economy principles such as energy efficiency, use of renewable local raw materials, and waste reduction, significantly increases production cost efficiency by an average of 12% (SD: ±3%) in halal industry players who have implemented this initiative for at least 1 year. In addition, there is increased access to new markets, especially foreign markets that require halal-thayyib and sustainability standards. As many as 38% of respondents reported an increase in orders from foreign consumers after adding halal and environmentally friendly certification (Zainal et al., 2021).

Social Impact

The implementation of the Green economy in the halal industry creates new green jobs, such as technical personnel for waste management, organic material processing, and clean technology-based logistics. Survey results show

that 65% of halal MSMEs stated that the adoption of green processes opened up additional job opportunities in new fields that previously did not exist. In addition, there is an increase in positive public perception of halal industry players, especially those who prioritize environmentally friendly practices (Hasan & Ahmad, 2022). This supports the argument that the sustainable halal industry has the potential to contribute to the welfare of local communities, especially through empowering local communities and improving the quality of life.

Environmental Impact

Environmentally, the integration of the Green economy framework results in: An average reduction in carbon emissions of 15% from alternative energy-based production processes. A reduction in solid waste of up to 20–25%, thanks to the use of organic material recycling systems (Yusoff et al., 2020). A conservation of water resources of 10–12% through the reuse of non-hazardous wastewater in the cleaning process. However, some actors reported that the initial investment costs for waste treatment systems or clean energy technologies are still a major obstacle.

Trade-Off and Synergy

Trade-off found: High initial investment in green technology results in increased short-term costs and can reduce initial profitability and Unpreparedness of small players in understanding environmental management systems causes resistance to change. Synergy created: There is a multiplier effect between increasing energy efficiency and expanding the halal-thayyib market and Collaboration between industry players, local governments, and academics produces an environmentally friendly and economically sustainable halal production ecosystem.

Stakeholder Roles and Policy Recommendations

Local Government

The local government acts as a regulator, facilitator, and accelerator in adopting the Green economy framework. Its main tasks include: Creating regulations and incentives that support sustainable halal production, such as providing tax incentives for green MSMEs. Facilitating training and technical assistance for industry players related to energy efficiency, waste management, and halal-eco-friendly certification. Providing basic green infrastructure, such as recycling centers, environmentally friendly logistics centers, and renewable energy technology for industry.

Halal Industry Players

Business actors are the main actors in implementing environmentally friendly practices directly. Their responsibilities include: Adopting sustainable production processes, such as the use of local raw materials, waste reduction, and energy efficiency. Innovating in halal-thayyib products that meet global sustainability standards. Building strategic partnerships with governments and research institutions for technology transfer and green knowledge. However,

many MSMEs still face limitations in terms of funding and technological capabilities (Zainal et al., 2021).

Civil Society Organizations (CSOs) and Educational Institutions: CSOs and universities play an important role as advocacy, education, and monitoring agents: Educating the public about the importance of consuming halal and environmentally friendly products. Conducting research and transferring knowledge related to green innovation and sustainable business. Becoming a liaison between the community, industry, and government in monitoring social and ecological sustainability.

Consumer

Consumers act as drivers of demand for halal products that are not only sharia-compliant but also ethical and sustainable. Increasing consumer awareness of halal-thayyib values can create positive market pressure. Studies show that 72% of young Indonesian Muslim consumers prefer halal products that are also environmentally friendly (Rahman et al., 2021).

Policy Analysis and Barriers

Existing Regulations:Regional Regulation No. 4 of 2020 concerning the Protection and Empowerment of MSMEs, Presidential Instruction No. 7 of 2022 concerning the Acceleration of the Development of the Halal Product Industry, National Green Policy (RPJMN 2020–2024) which emphasizes the circular economy and low-carbon development.Gaps and Barriers:Absencespecific technical regulationswhich integrates the halal industry with the principles of the Green economy. Low fiscal incentives and subsidies for the clean energy transition in the small-medium industrial sector. Limitationsaccess to green financefor halal MSME actors in Makassar. Lack of coordination between stakeholders in the halal industry ecosystem.

Policy Recommendations: Integration of Halal and Green Policies:The city government needs to developgreen halal industry blueprintwhich is a cross-sector reference (industry, environment, trade).Economic Incentives and Market Schemes:Implementationgreen technology subsidiesand tax relief for halal industries that meet environmentally friendly indicators. The formation ofgreen-halal labelas a value-added product for export markets and environmentally conscious consumers. Multi-Party Collaboration Platform: Establish a coordination forum between the government, business actors, academics, and CSOs to accelerate the transition of the green halal industry in Makassar. Literacy and Capacity Building: Integrated training on Green economy for local halal industry players, especially MSME players.Innovative Financing: Development Green Halal Fundor integration of green sharia financing through sharia banks and halal fintech platforms.

Case Study: Implementation of Green Economy Initiative in Halal Food Production in Makassar

One of the significant halal industry segments in Makassar is halal food production, which contributes a large proportion to the city's GDP. In recent years, halal food industry players in Makassar have begun to adopt Green economy principles as part of their efforts to improve their sustainability and

competitiveness. Several MSMEs, especially those in the processed food sector, have undertaken initiatives to reduce waste, use local raw materials, and energy efficiency. This case study will explore the initiatives taken by one of the halal food MSMEs in Makassar that has successfully integrated Green economy into their operations.

Description of Green Economy Initiatives Implemented

One of the business actors we studied was the UMKM "Makassar Green Foods", a local company that processes halal food products while paying attention to environmental sustainability. The Green economy initiative implemented by this UMKM includes several aspects: Use of renewable local raw materials: "Makassar Green Foods" prioritizes the use of locally produced and environmentally friendly raw materials, such as organic rice, pesticide-free vegetables, and other products from sustainable agriculture. Environmentally friendly production process: To reduce the carbon footprint, the company implements an efficient waste management system, including recycling organic materials and managing liquid waste with environmentally friendly technology. Reducing plastic use: They replace single-use plastic packaging with compostable or biodegradable packaging. Energy efficiency: Implementation of renewable energy, such as solar panels, to support their production operations.

Here are some of the best practices found in this case study: Collaboration with local farmers: By partnering with local organic farmers, this MSME not only supports the local economy but also reduces carbon emissions from long-distance transportation of raw materials. This also strengthens the halal-thayyib value, which emphasizes social and environmental welfare aspects. Innovation in waste management: The waste management system they implement, which allows them to process organic waste into compost, greatly reduces the waste load and provides direct ecological benefits, such as improving the quality of the soil around the production area. An educational consumer approach: "Makassar Green Foods" not only sells their products but also actively educates consumers about the importance of choosing food that is not only halal according to sharia, but also environmentally friendly. This builds customer trust and loyalty.

The implementation of the Green economy is not without challenges. Some of the main obstacles faced by "Makassar Green Foods" include: High initial costs: Investments in renewable energy systems (solar panels) and waste management technology require significant initial costs. Although there are long-term savings in operations, these initial costs are a major obstacle for other MSMEs who want to adopt similar practices. Limited access to green financing: One of the biggest obstacles is the difficulty for halal MSMEs in Makassar to obtain green financing or fiscal incentives from the government or Islamic financial institutions. This financing is essential for the transition to more sustainable industrial practices. Lack of supportive regulations: Although there are general policies that support the halal industry, there are no specific regulations that explicitly regulate or provide incentives for the adoption of the Green economy in the halal industry.

From this case study, several important lessons can be learned: Collaboration is key: Cooperation between MSMEs and local farmers can be a model of

sustainability that benefits both parties. This proves that the halal supply chain can be integrated with the Green economy principle. Consumer education is crucial: Educating consumers not only about halal, but also about environmental sustainability, can create greater demand for environmentally friendly and halal products. Government support: Green financing and fiscal incentives are key factors to help MSMEs accelerate the transition to a Green economy. Without sufficient support, MSMEs will find it difficult to invest in green technologies.

The success of "Makassar Green Foods" in implementing Green economy initiatives can be seen in two main aspects: Success: Reducing carbon emissions and efficient waste management have a positive impact on the environment and improve their brand image in the halal market, both domestically and internationally. These green practices allow them to expand their market to more environmentally conscious consumers. Failure: However, high costs and lack of green financing are obstacles that prevent more MSMEs in Makassar from following this path. Without greater intervention from the government or Islamic financial institutions, green initiatives are difficult to implement widely in the halal MSME sector.

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

This study focuses on the analysis of the application of the Green economy framework for the sustainability of the halal industry in Makassar. Based on the results of the study, several key findings that can be concluded are:

1. Green economy potential in the Halal Industry: Green economy, with the principles of resource efficiency, waste reduction, and the use of renewable energy, has great potential in improving the sustainability of the halal industry in Makassar. The implementation of Green economy not only has a positive impact on environmental aspects, but can also improve production cost efficiency and expand the market for environmentally friendly halal products.
2. Technological Innovation as a Catalyst: Innovation and green technology play a vital role in supporting sustainability. Waste management technologies, the use of renewable energy (such as solar panels), and eco-friendly packaging can significantly reduce the ecological impact of halal industry operations. Innovation in production processes, especially in the halal food sector, has shown that the application of green technology can increase competitiveness and create more sustainable products.
3. Challenges and Opportunities in Adopting Green Technology: Despite the huge potential, the adoption of green technology by halal industry players in Makassar is still limited by cost factors, limited access to green financing, and lack of supportive regulations. However, opportunities to encourage collaboration between stakeholders, including local governments, industry players, and financial institutions, can accelerate the transition to a more sustainable halal industry.
4. Role of Stakeholders: Governments, industry players, civil society organizations, and consumers have complementary roles in driving the adoption of the Green economy in the halal industry. Supportive policies,

more accessible green financing, and education for the public and industry players will accelerate this transition.

Recommendation

1. Role of government**:** The Makassar regional government needs to introduce more supportive regulations, such as fiscal incentives for halal companies that adopt the Green economy principle and green financing subsidies for MSMEs. In addition, promoting green policies through regional or local policies can reduce initial cost barriers.
2. Increasing support for green financing**:** Encouraging Islamic financial institutions to create green financing products that are more accessible to MSMEs can accelerate the transition to a green economy.
3. Further counseling and education**:** The government and CSOs need to increase outreach to the public and industry players regarding the long-term benefits of implementing a Green economy in halal products.

ADVANCED RESEARCH

Building on the findings of this study, advanced research is needed to systematically explore the integration of green economy principles within the halal industry through a multi-stakeholder governance lens, focusing on Makassar as a microcosm of broader sustainable development challenges in emerging economies. Future research should investigate the policy coherence between environmental sustainability and halal compliance, identifying gaps in regulatory frameworks, financial instruments, and institutional coordination that hinder the widespread adoption of green technologies. Employing a mixed-methods approach, such research should evaluate the readiness of halal MSMEs to transition toward green production models, assess consumer perceptions of eco-halal products, and analyze the scalability of green innovations through localized supply chains. Moreover, comparative studies between Makassar and other urban halal hubs could yield insights into best practices and adaptive models for green halal transformation, ultimately contributing to a strategic roadmap for a resilient, competitive, and environmentally sustainable halal economy.

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