



Green Economy in Indonesia in Research Trends, Implementation Challenges and Policy Directions

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Abstract

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Green economy has become a strategic paradigm in the pursuit of sustainable development, especially in addressing urgent global and national challenges such as climate change, environmental degradation, and the increasing demand for renewable energy resources. In the Indonesian context, the green economy is not only articulated in national planning documents such as the RPJMN, but it is also strategically positioned as both a tool for climate diplomacy and a driver of green investment opportunities. This article applies a Systematic Literature Review (SLR) approach to analyze scientific publications, focusing on the main trends, thematic priorities, and critical challenges in the implementation of the green economy in Indonesia. The review demonstrates that the majority of research emphasizes renewable energy, green financing, carbon trading, and circular economy. However, studies that address local-level policy, cross-sectoral integration, and the social justice dimension remain limited. Major challenges include the lack of integration between central and regional policies, insufficient financing mechanisms, and human resource capacity gaps. This article concludes that a successful transition toward a green economy in Indonesia demands a multidisciplinary perspective, stronger collaboration across stakeholders, and coherent long-term policy commitments that are adaptive to global sustainability dynamics.



1. Introduction

The concepts of the green economy are rooted in the Blueprint for a Green Economy report, written by Pearce, a monumental work that attempted to bridge the relationship between economics and the environment. The report emphasized that economic growth should no longer be measured solely by gross domestic product (GDP), but must also account for the environmental damage and social costs arising from unsustainable development. In line with the development of the global environmental discourse, this concept then gained broader legitimacy and evolved into a global agenda through the Green Economy Initiative launched by UNEP in 2008. In its initial phase, this idea was put forward as a response to increasingly complex environmental challenges, including climate change, depletion of natural resources, rising social inequality, and ecosystem degradation that threatens the sustainability of human life.

Conceptually, the green economy is defined as a development model that emphasizes low-carbon growth, efficiency in resource utilization, and social inclusivity that ensures justice for all levels of society (Aminata et al., 2022). This model is not just an alternative paradigm, but has become a global development direction recognized as one of the key instruments in achieving the Sustainable Development Goals (SDGs). In its development, the green economy is seen as a main pillar for realizing the integration of economic growth, social justice, and environmental sustainability in a balanced way (Maidasari et al., 2021). Thus, the green economy offers a more comprehensive framework in answering the challenges of sustainable development in the 21st century.

In Indonesia, the discourse on the green economy is gaining strength as the concept is integrated into the National Medium-Term Development Plan (*Rencana Pembangunan Jangka Menengah Nasional/ RPJMN*) and other medium-term development strategies. The government targets a new and renewable energy contribution of 23%, an ambitious figure that requires cross-sector synergy and massive investment in the energy sector. This effort is also supported by the introduction of various market instruments, including carbon trading and green financing mechanisms, which are expected to attract the participation of the private sector and the community (Putra et al., 2021).

However, the implementation of the green economy in Indonesia still faces various structural challenges that cannot be ignored. First, there is a real gap between the formulation of national policies and their implementation at the regional level. Dianjaya and Epira (2020) emphasize that many regional governments do not yet have adequate institutional capacity or human resources to implement the green agenda. Second, the aspect of financing is a major obstacle. Gulid (2020) notes that investment in green projects is still very limited, due to limited access to funding, high project risks, and low interest from the private sector.

Third, the transition to a green economy also raises social justice issues, especially related to the impact on communities that depend on carbon-intensive sectors such as mining and fossil fuels. Fathoni et al. (2021) emphasize that without a just transition strategy, vulnerable groups will be increasingly marginalized. In addition, the trend in academic research also shows a dominance of issues related to renewable energy, energy efficiency, and green technology. Meanwhile, social aspects,

the dimension of justice, and cross-sectoral integration are relatively less noticed. Yulitasari et al. (2023) highlights the potential of the circular economy as a solution in waste management and resource optimization, but its application is still limited to big cities and has not reached rural areas. Gu et al. (2021) emphasize the importance of cross-sectoral policy cohesion, as fragmentation between ministries and agencies often leads to overlapping programs and weak coordination. Thus, there is a significant research gap between the potential of the green economy as a national development strategy and the reality of its implementation on the ground. This article aims to map research trends, main focuses, the challenges faced, as well as provide strategic recommendations that can strengthen the direction of Indonesia's green economy policy, both at the national and regional levels.

2. Literature Review

2.1. Green Economy and Sustainable Development in Indonesia

Recent literature shows that the green economy in Indonesia is increasingly positioned as one of the main pillars of sustainable development that is in line with the Sustainable Development Goals (SDGs). This indicates that the direction of national development is no longer oriented only to economic growth, but also pays attention to the environmental and social dimensions as an inseparable part. Maidasari et al. (2023) emphasize the importance of energy transition as the heart of the green economy, because the shift from fossil fuels to new and renewable energy is considered a strategic step in reducing carbon emissions, increasing energy efficiency, and strengthening national energy security. This transition is also seen as an

opportunity to present technological innovation, encourage new investment, and expand the clean energy market in Indonesia.

On the other hand, Martawardaya et al. (2022) highlights the socio-economic impact of green policies on local communities, especially how the implementation of these policies can affect daily life, livelihoods, and the regional economic structure. This impact can be positive, such as an increase in new job opportunities in the renewable energy sector and sustainable resource management, but it also raises challenges, such as the potential marginalization of communities that depend on carbon-intensive sectors. Therefore, the green economy concept in Indonesia does not only focus on the aspect of energy efficiency, but also includes social inclusivity, the creation of just jobs, and the protection of ecosystems as the foundation for long-term sustainability. With this more holistic approach, the green economy is expected to be an instrument of structural transformation towards a more just, environmentally friendly, and globally competitive development.

2.2.Challenges and Research Gaps

Several recent studies identify a number of key obstacles in the implementation of the green economy agenda in Indonesia, especially those related to the aspects of financing, institutional capacity, and the low capacity of regions in running environmentally friendly policies. Dianjaya & Epira (2020) emphasize that the biggest obstacles actually arise at the regional level, where many local governments do not yet have technical instruments, an adequate bureaucratic structure, or competent human resources to integrate the principles of the green economy into development programs. This condition causes a considerable gap between national regulations and

implementation practices on the ground. In addition, Yulitasari et al. (2023) shows that the application of the circular economy concept in Indonesia is still at an early stage and tends to be limited.

The circular economy, which is supposed to encourage sustainable waste management and the reuse of resources, still faces serious obstacles, both from the aspect of limited project scale, low public awareness, and lack of active community participation. As a result, the great potential of this approach has not been realized optimally. Meanwhile, Gu et al. (2021) emphasize the need for cross-sectoral policy integration to avoid fragmentation between ministries and agencies. Without strong synergy, green policies risk being partial. On the other hand, research on the aspect of social justice in the energy transition and low-carbon development as raised by Fathoni et al. (2021) is still very limited. In fact, the dimension of social justice is very important to ensure the realization of a just transition, so that it does not cause new social exclusion or inequality.

3. Methods

This research uses a Systematic Literature Review (SLR) approach based on the PRISMA protocol which is widely recognized as a standard in conducting systematic reviews. This protocol was chosen to ensure that every stage of the research is carried out in a transparent, structured, and replicable manner by other researchers. The research process begins with the identification of scientific articles through the Google Scholar database using relevant keywords, namely “green economy”, “Indonesia”, “sustainable development”, and “policy”. The selection of these keywords is intended

to make the search scope more comprehensive, while reflecting the research focus which emphasizes the relationship between the green economy and sustainable development policies in Indonesia. From the initial search results, a total of some articles were found that matched these keywords. Furthermore, a gradual filtering process was carried out by reviewing the title, abstract, and year of publication, so that only articles that met the relevance criteria were retained.

Further selection was carried out more strictly, retaining only articles that specifically discussed issues closely related to the focus of this research. The criteria prioritized included articles that touched on the topic of green economy policies, new and renewable energy transitions, green financing instruments and mechanisms, the development of a circular economy as a waste management model, and a discussion of the socio-economic implications of the application of green policies. From the results of this selection, a total of several articles were obtained that were considered most relevant and met the eligibility standards for further analysis. These articles were then analyzed using the thematic analysis method. This approach was chosen to allow the grouping of main issues into several major themes, namely: renewable energy and energy transition, financial instruments and green investment, circular economy and waste management, national and regional level policies, and the dimension of social justice in the green transition.

With this approach, the research not only provides a comprehensive overview of current research trends, but is also able to identify the research gaps that still exist in the field of the green economy. In addition, this method also facilitates the

formulation of more targeted strategic recommendations to support the strengthening of green economy policies in Indonesia, both at the national and regional levels.

4. Results

The results of the systematic review of several relevant articles show that the green economy in Indonesia is developing not only as an academic discourse, but also as a national policy instrument that is gaining legitimacy over time. This can be seen from the large number of studies that link the concept of the green economy with sustainable development, the formulation of energy transition strategies, and the integration of environmental issues into the macroeconomic policy framework. The main trend of research tends to focus on issues of renewable energy, green financing, carbon trading, circular economy, and the socio-economic implications of the transition to low-carbon development. Thus, it can be said that the academic literature on the green economy in Indonesia is no longer normative, but has developed in a more applicative direction, highlighting the real opportunities and challenges faced in implementation practice.

In the entire literature, five dominant themes were found that are intertwined and cannot be separated from each other. The five themes include: energy transition and resource diversification, financial instruments and green investment, waste management and circular economy, national-regional policy governance, and the dimension of social justice in the green transition. These five themes appear consistently in various studies, with different weights and depths of discussion, but still show a close relationship. The energy transition is the most dominant theme.

Indonesia is still very dependent on fossil fuels, especially coal, which has been the main source in the national energy mix. This dependence not only causes environmental problems due to high carbon emissions, but also causes long-term economic problems, as more and more countries switch to clean energy, so the demand for coal has the potential to decrease. The target of a renewable energy mix of 23% demands accelerated transformation in various sectors (Maidasari et al., 2023).

Various studies show that solar energy, bioenergy, and geothermal are the most discussed sectors because they are considered to have great potential to be developed in Indonesia. Solar energy, for example, has very high technical potential given Indonesia's geographical conditions on the equator. However, until now, the installed capacity of solar energy is still very low compared to its potential. Likewise with bioenergy and geothermal, which require large initial investment and sophisticated technological support. The main challenges in the energy transition are limited infrastructure, high investment costs, and low government incentives to encourage the adoption of renewable energy technology. Many studies highlight that fossil fuel subsidies are still too large, which causes price distortions that make renewable energy less competitive. On the other hand, there are also regulatory obstacles, such as the slow licensing process and uncertainty of long-term policies.

Nevertheless, a number of studies also emphasize that the energy transition not only brings challenges, but also creates new economic opportunities, especially in the creation of green jobs that can absorb local labor. This shows that the energy transition in Indonesia is not just a technical issue, but also a socio-economic issue that has broad implications for society. The aspect of green financing has received

significant attention in the literature. As shown by Gulid (2020), innovative financing schemes such as green bonds, blended finance, and carbon market mechanisms are still of limited use in Indonesia. In fact, green financing is very important to accelerate the energy transition and sustainable development. One of the main challenges is the low capacity of local financial institutions in managing environmental risks. Many banks and financial institutions in Indonesia still consider green projects to have high risks due to market, technology, and regulatory uncertainty. On the other hand, the business world also still has minimal understanding of green financial instruments. This makes the number of projects that obtain green funding relatively small.

In the policy context, the existence of the Green Taxonomy launched by the Financial Services Authority (*Otoritas Jasa Keuangan/OJK*) is an important first step to provide a framework for financial institutions in channeling financing. However, its implementation still requires cross-sectoral harmonization so that this taxonomy is truly effective. Several studies also highlight the potential of carbon trading as an alternative funding source for green projects (Putra et al., 2021). However, until now its contribution is still limited because the domestic carbon market has not developed optimally, both in terms of regulation and supporting infrastructure.

The issue of the circular economy is becoming more prominent in the latest literature. Yulitasari et al. (2023) explains that the application of a circular economy in waste management and recycling can reduce dependence on natural resources while creating economic added value. The circular economy encourages the reuse, extension of product life, and utilization of used materials into new goods that have economic value. However, the implementation of this concept still faces serious obstacles,

especially at the scale level. Most circular economy programs are only run in big cities with the involvement of certain private sectors. These programs often still have a pilot project nature and have not been integrated into the overall regional development strategy.

In addition to scale constraints, public awareness of the importance of waste reduction, recycling, and material reuse is also still low. Consumptive behavior that produces large volumes of waste is not yet in line with the awareness to sort and reduce waste. This indicates the need for a more inclusive community-based approach, so that the circular economy can develop not only in big cities, but also in rural areas and other regions. Thus, the circular economy has great potential, but its implementation is still limited. Fourth, the governance of national and regional policies shows a gap. Dianjaya and Epira (2020) found that although the green economy has been adopted in national documents such as RPJMN and RUEN (*Rencana Umum Energi Nasional*), many regional governments do not yet have the institutional capacity or clear strategic plans to support the green agenda. Policy fragmentation is also still high, where each ministry tends to work in silos without adequate coordination. As a result, it is difficult to achieve the cross-sectoral synergy needed in the implementation of the green economy. However, the implementation of the green economy at the regional level shows mixed results.

One of the main challenges is the lack of uniform regulations between the central and regional governments. Green economy policies are often formulated at the national level without considering the specific capacity or conditions of the regions, so their implementation becomes less effective (Zhang et al., 2022). In

addition to fragmentation between ministries, coordination between actors at the central and regional levels is also weak. Many policies issued at the central level are not fully understood or implemented in the regions. This hinders the consistency of green economy implementation, especially in the energy and waste management sectors. Some studies also highlight that human resource capacity in the regions is still limited, so green programs are difficult to run effectively. In other words, governance that is not yet integrated is one of the main obstacles in accelerating the green economy in Indonesia.

Fifth, the dimension of social justice is one of the important issues, but it is relatively less discussed in the literature. Fathoni et al. (2021) show that the energy transition can cause significant social impacts, especially for communities that depend on carbon-intensive sectors such as coal mining. If the transition is not managed properly, then communities that depend on these sectors will experience great losses, loss of livelihoods, and be increasingly marginalized from the development process. Conversely, the application of just transition principles can ensure that affected communities receive support in the form of new skills training, economic compensation, and alternative job opportunities. Martawardaya (2022) emphasizes that green policies must be designed not only to encourage economic growth, but also to protect vulnerable groups who are most affected by the changes. Therefore, social justice is an important dimension that should not be ignored.

Unfortunately, until now research on the aspect of social justice in the energy transition and low-carbon development is still limited. The literature shows that although the green economy concept has gained legitimacy in national policies and

academic discourse, its implementation still faces significant structural challenges. The gap between central and regional policies, limited funding, weak cross-sectoral integration, and lack of attention to social justice aspects are the main obstacles. However, the potential of the green economy as a development strategy for Indonesia is very large. The green economy is not only relevant for the domestic context, but also in the global context, especially in climate diplomacy. Indonesia can use the green economy to strengthen its position in international negotiations, attract foreign investment, create green jobs, and develop competitive clean technology. With appropriate policy steps, stronger cross-sectoral coordination, and attention to the dimension of social justice, the green economy has the potential to become a strategic instrument for a more just, sustainable, and inclusive national development transformation in the future.

5. Discussion

The findings of this Systematic Literature Review (SLR) show that the green economy in Indonesia is currently in a dynamic transition phase, with great potential as well as structural obstacles that must be managed simultaneously. Indonesia has a strategic opportunity to develop a green economy as an integral part of the sustainable development agenda, but the transition process is not simple because it is influenced by policy, financial, social, cultural, and institutional factors.

From a policy perspective, Indonesia has demonstrated a strong commitment to green economy development through a number of important documents such as the RPJMN (National Medium-Term Development Plan) and RUEN (National

General Energy Plan). In addition, there are also various regulatory instruments that affirm the direction of low-carbon development, including the Presidential Regulation on SDGs which integrates the sustainable development agenda into the national policy framework, as well as Presidential Regulation No. 98/2021 on the economic value of carbon which serves as the legal basis for managing emissions through carbon trading mechanisms. Although this policy framework is quite comprehensive at the national level, its implementation still faces major challenges. Existing policies have not been fully integrated horizontally or vertically, so implementation at the regional level tends to be varied, partial, and inconsistent. This finding is in line with Dianjaya and Epira (2020) who emphasize the importance of cross-sectoral cohesion and inter-agency coordination as a key to the success of the green economy in Indonesia.

From a financial perspective, progress towards green financing is actually starting to be seen, for example with the launch of the Green Taxonomy by the Financial Services Authority (*Otoritas Jasa Keuangan* / OJK) and the development of the carbon market as a new mechanism to support the funding of green projects. However, access to green funding is still limited, especially for renewable energy and circular economy projects that require large investments with high risk levels. Rahmawati et al. (2022) emphasize the need for innovation in financing mechanisms, including by encouraging the involvement of the private sector, international financial institutions, and more adaptive non-conventional financing instruments.

The socio-economic aspect also emerges as an important dimension that should not be ignored. As shown by Fathoni et al. (2021), the transition to a green economy must pay attention to the dimension of social justice so that it does not cause

economic exclusion for certain groups of society. Reskilling programs for workers, the provision of social safety nets, and the creation of new jobs based on renewable energy must be an integral part of the energy transition policy.

In addition, the academic discussion on the green economy in Indonesia still tends to be dominated by energy and technology issues, while aspects of governance, culture, and community behavior are relatively less given serious attention. Yulitasari et al. (2023) emphasizes that the success of the application of the circular economy concept is highly influenced by the level of community participation. Without the awareness and active involvement of local communities, the implementation of the circular economy will only be limited to technical projects that do not have a broad impact. Therefore, further research needs to pay attention to social, cultural, and community behavior factors, because these factors determine long-term success.

Thus, the results of this review strengthen the argument that the green economy in Indonesia is not just a technical or economic issue, but is a multidimensional problem that includes social, institutional, cultural, and governance aspects.

6. Conclusion

The green economy has become one of the main strategies for sustainable development in Indonesia, in line with the global agenda of climate change mitigation and the achievement of the SDGs. Through a systematic literature review, this article finds that research in Indonesia highlights issues of renewable energy, green financing, the circular economy, central-regional policy, and social justice. However,

implementation still faces challenges in the form of limited funding, weak cross-sectoral coordination, and regional capacity gaps.

The green economy has great potential to encourage the structural transformation of the Indonesian economy, especially in creating green jobs, reducing dependence on fossil fuels, and strengthening Indonesia's position in global climate diplomacy. However, the success of this agenda is highly dependent on policy consistency, central-regional integration, and the application of social justice principles in every policy. Therefore, a multidisciplinary and collaborative approach is needed that involves various stakeholders. The government needs to strengthen regulations and policy coordination, the private sector needs to be encouraged to invest in green projects, and the community must be actively involved in the transition process. With this synergy, the green economy can truly become a strategic pillar of sustainable, just, and inclusive national development in the future.

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