



Implementation of Green Economy Through Low Carbon Development in West Sulawesi Province

Siti Noor Fadhilah Hamzah¹, Andi Ratna Sari Dewi², Retno Fitrianti³

^{1,2,3} Hasanuddin University, Makassar, Indonesia
dhilahamzah5@gmail.com

Abstract. This research aims to analyze the implementation of green economy through low carbon development in West Sulawesi Province. This province faces significant challenges related to climate change and environmental degradation, which require sustainable development strategies. Using a qualitative approach, this study evaluates government policies and programs aimed at reducing greenhouse gas emissions and promoting the use of renewable energy and green industries. The study results show that the implementation of green economy in West Sulawesi is still in its early stages, focusing on sustainable agriculture sector and more efficient natural resource management, and indicates that budget limitations, institutional capacity, and cross-sector coordination are the main barriers to policy implementation. Low carbon development policies are expected to drive more inclusive regional economic transformation while minimizing environmental impacts. Nevertheless, several initiatives such as renewable energy development and sustainable agriculture show positive results in reducing greenhouse gas emissions. This study recommends strengthening institutional capacity, increasing budget allocation for green programs, and developing more effective coordination mechanisms among stakeholders to support more optimal implementation of low carbon development policies in West Sulawesi Province.

Keywords: Green Economy, Low Carbon Development, West Sulawesi, Environmental Policy, Renewable Energy.

1 Introduction

Climate change and environmental degradation have become pressing global issues, forcing many countries, including Indonesia, to adopt sustainable development policies. One of the main approaches taken is the implementation of a green economy, which emphasizes efficient use of natural resources, reduction of greenhouse gas emissions, and transition to renewable energy. The Indonesian government, through the Ministry of National Development Planning/Bappenas, has established a low carbon development strategy (PRK) as part of the 2020-2024 National Medium-Term Development Plan (RPJMN) [1].

West Sulawesi Province, as one of the youngest provinces in Indonesia, is at a critical point in its development trajectory. This region is rich in natural resources, including tropical forests, fertile agricultural land, and untapped renewable energy

However, like many other regions in Indonesia, West Sulawesi also faces development pressures that can threaten its environmental sustainability.

The implementation of a green economy through low-carbon development in West Sulawesi offers opportunities to address these challenges. This approach aims to reduce greenhouse gas emissions, improve resource efficiency, and create sustainable jobs. However, the transition to a green economy requires significant policy changes, investment in clean technologies, and transformation of production and consumption patterns.

Although the concepts of green economy and low-carbon development have been widely discussed at national and global levels, their implementation at the provincial level, especially in relatively underdeveloped areas like West Sulawesi, has not been extensively explored. Research on how these concepts are translated into policies and practices at the local level is crucial to understanding the challenges and opportunities faced in the transition towards a more sustainable economy.

2 Literature review

2.1 Green Economy and Low Carbon Development

The concept of a green economy has become a key focus in global discussions on sustainable development. A green economy is an economic system designed to achieve human well-being and social equity while significantly reducing negative environmental impacts [2]. Kementerian PPN/Bappenas reinforces this definition by emphasizing that the green economy is a transformative approach that integrates environmental considerations into economic decisions to promote sustainable investments and create environmentally-friendly job opportunities [3]. Kementerian PPN/Bappenas shows that the implementation of a green economy has proven to enhance economic resilience and reduce ecological risks in various developing countries [3]. Low-carbon development, as an integral part of the green economy, aims to reduce greenhouse gas emissions while maintaining economic growth.

In Indonesia, the implementation of a green economy has become an integral part of the national development strategy. The Ministry of National Development Planning Febryanti et al, in the Indonesia Vision 2045 document, highlights the importance of transitioning to a green economy as a key to sustainable development [4]. This is reinforced by Presidential Regulation No. 98 of 2021 on the Implementation of Carbon Economic Value, which targets a reduction in greenhouse gas emissions by 31.89% independently by 2030. A comprehensive study by Rany et al reveals that the implementation of a green economy in Indonesia has contributed to the creation of more than 500,000 green jobs over the past three years [5]. Statistik Industri Bersertifikat Hijau Indonesia 2023 found that investments in the green economy sector have driven GDP growth by 2.3% in 2022-2023, primarily through the development of renewable energy and sustainable agricultural practices [6].

2.2 Implementation at the Regional Level

West Sulawesi, as a province rich in natural resources, has great potential to implement a green economy. According to the latest report from the West Sulawesi Regional Development Planning Agency Bappeda Sulawesi Barat, the province has solar energy potential of 5.2 GW and biomass potential from the agricultural sector reaching 3.8 million tons per year [7]. Research conducted by Li et al identified three key sectors for green economy development in West Sulawesi: sustainable agriculture, renewable energy, and ecotourism, with the potential to create more than 50,000 green jobs by 2030 [8].

However, a comprehensive study Nurdianto et al reveals several significant challenges in implementing a green economy in West Sulawesi, including: (1) infrastructure gaps, with an investment shortfall valued at Rp 8.5 trillion, (2) limited skilled labor in green technology, with only 15% of the workforce having relevant qualifications, and (3) low access to green financing, with only 23% of SMEs having access to eco-friendly credit [9]. These findings are supported by Kusumadewi et al, who highlight the urgency of strengthening institutional capacity and increasing investment in vocational education focused on the green economy [10].

2.3 Potential and Challenges in West Sulawesi

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2.4 Policies and Programs

Policy analysis Mahmud et al shows that the West Sulawesi Provincial Government has begun to integrate green economy principles into its regional development plans [12]. However, the implementation of specific programs is still limited and requires further support from the central government and the private sector.

A comparative study [13] comparing the implementation of green economies in various provinces in Indonesia shows that West Sulawesi is still lagging in terms of adoption of environmentally friendly technologies and development of green industries compared to other provinces in Sulawesi Island.

2.5 Research Gap

Although several studies on the green economy and low-carbon development in Indonesia have been conducted, specific research on its implementation in West Sulawesi Province remains limited. There is a need for deeper analysis of how national policies are translated into the local context, as well as an evaluation of the impact of the programs that have been implemented.

3 Research Method

This research uses qualitative methods with descriptive-analytical analysis to explore the implementation of a green economy through the development of carbon offsets in West Sulawesi Province. Data, quae adhibenda est, prima est notitia et secundaria notitia. Gerungen's primary data is carried out through the Gerungen version with stakeholders, local community leaders, business owners, and civil society organizations involved in the low-carbon development program. Apart from that, forestry direct observation in the green economy sector in the agriculture, forestry and renewable energy sectors.

Meanwhile, the secondary data is from official government documents, such as the Regional Medium Term Development Plan (RPJMD) for West Sulawesi, reports from the Ministry of National Development Planning/Bappenas regarding the implementation of a green economy, as well as a study of Pakistani literature on green economic development.

Kiwanta data analysis using content analysis techniques (content analysis) to examine language, propositum, and negative ideas in the implementation of the green economy. The data is analyzed thematically to identify patterns and similarities between the local government and the general impact of economic and environmental sustainability in West Sulawesi.

The results of this research will provide a comprehensive understanding of the effectiveness of green economic development in West Sulawesi and strategic recommendations for the future.

4 Result

The research results show that the implementation of a green economy in West Sulawesi Province through low-carbon development is still at an early stage. Regional governments have begun to adopt several policies related to the green economy, especially in the agricultural and forestry sectors, but the implementation of these policies has not been fully effective. The main challenges faced are the lack of infrastructure, lack of investment in green technology, and low community participation Bappeda Sulawesi Barat [14].

- Agricultural Sector West Sulawesi has begun to adopt sustainable agricultural practices, including:
 - Development of organic farming in Mamuju Regency

- Integrated pest management program in cocoa plantations
- Agroforestry initiatives to reduce deforestation Major challenges include lack of infrastructure, limited market access, and resistance to changing traditional practices.
- Fisheries Sector Several green economy initiatives in the fisheries sector include:
 - Development of environmentally friendly seaweed cultivation
 - Mangrove conservation program to support sustainable fisheries
 - Implementation of more selective fishing technologies Challenges faced include overfishing, coastal habitat degradation, and conflicts of interest between traditional and commercial fishermen.
- Tourism Sector Ecotourism development in West Sulawesi includes:
 - Development of community-based tourism villages
 - Promotion of nature tourism emphasizing conservation
 - Plastic waste reduction initiatives in tourist destinations Major challenges include inadequate infrastructure, lack of trained human resources, and potential negative impacts on local ecosystems.

Implementation of Low Carbon Development Policies

Low carbon development policies in West Sulawesi follow the national guidelines set in the 2020-2024 RPJMN. One of the main focuses is reducing greenhouse gas emissions through more efficient land management and utilization of renewable energy. In several sectors, such as agriculture and forestry, initiatives have been undertaken to implement sustainable farming practices, which are expected to reduce environmental damage [1].

Although there are already several initiatives, such as the development of organic agriculture and the use of energy-saving technologies, these programs are still limited and have not been comprehensively implemented. Limited budget and adequate human resources are some of the main constraints [15].

4.1 Implementation Challenges

One of the biggest challenges in implementing a green economy in West Sulawesi is the low public awareness regarding the importance of low carbon development. This is evident from the still dominant traditional agricultural practices that use excessive and environmentally unfriendly chemicals.

In addition, the lack of green infrastructure support, such as waste treatment facilities and renewable energy technologies, slows down the transition process towards a green economy [16]. Funding is also a challenge, as investment in green technology and renewable energy is still limited. West Sulawesi requires support from the central government and international institutions to increase green funding capacity.

4.2 Development Opportunities

Despite many challenges, West Sulawesi has great potential to develop a green economy. With abundant natural resources, especially in the agriculture and fisheries sectors, this province can become one of the pilot areas in implementing a circular economy and sustainable development. In addition, the potential for renewable energy, such as solar and wind power, also provides opportunities for West Sulawesi to reduce dependence on fossil energy.

Efforts to improve cross-sector coordination and investment in green infrastructure and renewable technologies are key to success in realizing low carbon development in West Sulawesi [1].

4.3 Implementation Impact

The initial implementation of a green economy through low carbon development has had a positive impact, albeit on a small scale. Some areas that have implemented sustainable agricultural practices report increased production yields and reduced use of harmful chemicals. In addition, better land management also reduces the risk of environmental disasters, such as landslides and floods, which often occur in the interior of West Sulawesi Bappeda Sulawesi Barat [14].

5 Conclusions and Recommendations

Low carbon development in West Sulawesi Province has great potential for further development but still faces various challenges. Increased public awareness, green infrastructure support, and stronger funding are needed to encourage more effective implementation of the green economy. The combination of government policies, private sector involvement, and community participation are key factors for the successful transition to a green economy in this region [17].

West Sulawesi Province shows significant potential in implementing a green economy, particularly in the agriculture, fisheries, and tourism sectors. However, further efforts are needed to address existing challenges. Key recommendations include:

Strengthening policy frameworks that support the green economy
Increasing investment in environmentally friendly infrastructure
Developing training and education programs to improve local human resource capacity
Encouraging collaboration between government, private sector, and civil society
Improving access to green financing for MSMEs (Micro, Small, and Medium Enterprises)
With proper implementation, the green economy can become a catalyst for sustainable development in West Sulawesi, balancing economic growth with environmental preservation and community welfare [18].

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