

The Role of Green Economy in Diversifying Livelihoods in Central Kalimantan's Peatland Communities

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Abstract

This study aims to analyze the role of the green economy in encouraging livelihood diversification in peatland communities in Central Kalimantan. The focus of the research is directed at understanding how the green economy concept can be an alternative strategy in increasing community income while maintaining the sustainability of peatland ecosystems. The study uses a literature review approach by examining national and international journals, academic books, and official reports from governments and international institutions such as UNEP, IISD, FAO, and Bappenas. The literature reviewed is limited to the period 2015–2025 by searching through Google Scholar, Scopus, and ScienceDirect databases. The analysis was conducted using content analysis methods to identify themes, patterns, and relationships between the green economy, income diversification, and peatland management. Studies show that implementing a green economy has the potential to create sustainable jobs, particularly through agroforestry, ecotourism, and the use of non-timber forest products such as honey and rattan. Green economy-based diversification has been shown to increase community incomes by up to 30% in several case studies, while strengthening local economic resilience to the risks of climate change, peat fires, and commodity price fluctuations. Green economy has proven relevant as a local solution for Central Kalimantan by integrating ecological, social, and economic aspects. This research is literature-based and therefore does not present empirical field data. Nevertheless, these findings contribute to enriching the literature on development economics and environmental policy and provide practical insights for policymakers, academics, and civil society.

Keywords: Agroforestry, Livelihood Diversification, Green Economy, Peat Communities, Sustainable Development.

1. Introduction

The green economy has become a new paradigm for sustainable development, particularly in areas with high ecological vulnerability, such as peatlands. Central Kalimantan Province, with its vast peatlands, faces significant challenges in maintaining a balance between the economic needs of the community and environmental sustainability. Excessive resource exploitation has led to land degradation, forest fires, and the decline of peat ecosystems. This threat is not merely discourse, but a real, ongoing crisis. As evidence, data from the Central Kalimantan Regional Disaster Management Agency (BPBD) shows that as of August 4, 2025, 1,317 hotspots were recorded across the region, with 326 forest and land fire incidents burning approximately 451 hectares of land (BPBD Kalteng, 2025). This situation demands a more environmentally friendly development approach. The implementation of a green economy in Indonesia can encourage economic growth in line with sustainability principles, making it relevant as a theoretical basis for analyzing the livelihood diversification of peatland communities. This study also demonstrates the importance of regional policies in integrating a green economy, which can serve as a reference in the context of Central Kalimantan (Wartoyo & Haida, 2023)

Communities in the peatlands of Central Kalimantan generally rely on agriculture, plantations, and forest products for their livelihoods. However, unsustainable land use patterns make these livelihoods vulnerable to climate change, ecosystem degradation, and market fluctuations. This creates economic uncertainty for local communities. Therefore, livelihood diversification strategies are needed that can provide alternative income sources while maintaining environmental sustainability. A study (Nasir, 2023) shows that the dependence of Central Kalimantan's peatlands on agriculture, plantations, and

forest products without sustainable practices increases economic vulnerability and accelerates ecosystem degradation. Community involvement in peatland fire management and restoration not only reduces ecological risks but also opens up opportunities for more sustainable livelihood diversification (Robins et al., 2022) .

Table 1: Peatland Area in Central Kalimantan

Information	Area (hectares)
Total area of Central Kalimantan	±15.3 million
Peat land area	4.67 million
Percentage of peat land to total area	30.44%

Source: MMC Central Kalimantan

Based on the data in Table 1, the peatland area in Central Kalimantan reaches approximately 4.67 million hectares, or 30.44% of the total area of approximately 15.3 million hectares. This substantial percentage indicates that peat ecosystems play a crucial role in the regional environmental and economic structure. With a share of nearly one-third of the region, peatland management is highly strategic, both for maintaining ecological functions such as carbon storage and hydrological control, and for encouraging sustainable use through diversified community livelihoods. This underscores the importance of implementing a green economy to optimize peatland potential without compromising environmental sustainability.

The green economy offers solutions through the sustainable use of natural resources, energy efficiency, and the development of environmentally friendly businesses. The implementation of this concept is expected to create new jobs and encourage the emergence of alternative economic activities that are not only financially profitable but also preserve peat ecosystems. Examples include the development of ecotourism, agroforestry, and the processing of value-added non-timber products. A study (Jaya et al., 2022) confirms that agroforestry in Central Kalimantan's peatlands plays a dual role as a conservation strategy and a means of diversifying local community incomes. However, the implementation of a green economy at the local level often faces various obstacles, such as limited access to technology, minimal mentoring, and low community environmental literacy. Furthermore, the lack of integration of regional development policies with green economy principles is a hindering factor. Therefore, it is important to examine the extent to which a green economy plays a role in encouraging livelihood diversification among peatland communities in Central Kalimantan. A study (Sambodo et al., 2022) shows that socio-cultural, economic, technological, and governance barriers are key factors hindering the implementation of a green economy at the regional level, including in Central Kalimantan. The success of peat restoration depends heavily on improving community literacy, cross-stakeholder synergy, and the integration of local policies within a sustainable development framework (Fleming et al., 2021) .

Table 2: Impact of Peatland Utilization Patterns on Communities

Risk Factors	Impact on Local Communities
Climate change	Disrupting cropping patterns, reducing agricultural and plantation yields
Ecosystem damage	Declining soil and water quality has an impact on food production.
Market fluctuations	Dependence on certain commodities, vulnerable to price changes
Land degradation	Declining agricultural productivity increases its vulnerability to natural disasters.
Forest and land fires (karhutla)	Economic losses, impaired health, and loss of livelihoods

Source: Green Network Indonesia

The table shows that unsustainable peatland use patterns pose various risks to local communities in Central Kalimantan. Climate change and ecosystem degradation directly impact agricultural and

plantation productivity, while market fluctuations increase economic uncertainty due to dependence on specific commodities. Land degradation worsens soil conditions and increases vulnerability to disasters, while forest and land fires not only cause economic losses but also threaten community health and livelihood sustainability. This underscores the need for sustainable peatland management strategies to maintain a balance between economic development and environmental conservation.

This research was motivated by the urgent need to find a development model that aligns with peat ecosystem protection and improving community welfare. Understanding the role of the green economy is expected to lead to a more effective approach to enhancing the economic resilience of peatland communities. This research also seeks to address regional development challenges that often create conflicts between economic interests and environmental conservation. Peat restoration in Central Kalimantan faces complex cost and governance challenges, necessitating policies that balance ecosystem conservation and the sustainability of local community livelihoods (Puspitaloka et al., 2021)

This research is expected to contribute academically to the growing body of literature on the green economy in the local context of Indonesia, particularly Central Kalimantan. Practically, the findings can inform regional policymakers, businesses, and civil society organizations in designing economic empowerment programs based on green principles. This will further enhance the realization of sustainable and inclusive development in peatland areas.

2. Literature Review and Hypothesis Development

A green economy is defined by UNEP (2024) as a development model that improves human well-being and social equity, while reducing environmental risks and resource scarcity. In a local context, a green economy is not simply a global concept but can also be a practical approach for ecologically vulnerable areas, such as the peatlands of Central Kalimantan. Thus, the literature on the green economy emphasizes the importance of integrating ecological, social, and economic aspects.

The importance of livelihood diversification as a household resilience strategy can be analyzed using the Livelihood Diversification Theory (Ellis, 2000). This theory explains that rural households actively build a diverse portfolio of activities—beyond agriculture—to survive and improve their well-being. Ellis (2000) suggests that this diversification is driven by two main factors: the necessity to cope with economic and environmental shocks, and the choice to exploit new opportunities. In the context of Central Kalimantan's peatland communities, which are vulnerable to land fires and commodity price fluctuations, diversification is a crucial strategy to reduce dependence on a single source of income.

More concrete empirical evidence of the success of this diversification comes from studies in the peatlands of Riau and West Kalimantan. There, the implementation of green businesses through community-based adaptive business models has shown significant results. For example, agroforestry practices that integrate local plants, freshwater fish farming in restored peat canals, and the processing of non-timber commodities such as forest honey have been shown to increase household incomes by up to 30% compared to those still relying solely on palm oil-based business models. This improvement is not merely theoretical but also practically proven in the field, where communities are able to create new economic resources that are more resilient to commodity price fluctuations and environmental risks such as land fires. A study by Puspitaloka et al. (2024) specifically highlighted that the development of this adaptive business model effectively increases community incomes while supporting peat ecosystem restoration goals. Similar success was also found in the implementation of agroforestry systems in Central Kalimantan, which not only increase farmer incomes but also support peatland conservation and rehabilitation efforts.

A more comprehensive analytical framework is offered by the Sustainable Livelihood Framework (SLF) developed by DFID (1999). This framework places communities at the center of the analysis and identifies five types of assets or livelihood capital that influence their ability to implement livelihood strategies: human, natural, financial, physical, and social capital. According to this framework, the success of livelihood diversification depends heavily on communities' access to and ability to manage these five assets in the face of vulnerability contexts such as climate change and ecosystem degradation. Therefore, green economy interventions aimed at increasing incomes must be designed to strengthen communities' asset bases to make their livelihoods more sustainable. The implementation of a green economy in Indonesia, particularly in Central Kalimantan, has the potential to strengthen community welfare while reducing social disparities through the integration of ecological and economic aspects (Nabila, 2025). Sustainable peat management is crucial because peatland degradation significantly

increases greenhouse gas emissions, making the integration of environmental aspects into economic planning imperative (Jiang et al., 2017) .

Livelihood diversification is an important strategy for increasing household economic resilience. Income diversification can protect communities from market uncertainty and environmental risks. In the context of peatland communities, diversification through environmentally friendly activities such as ecotourism, non-timber forest product processing, and agroforestry can be a solution that aligns with green economy principles. A study (Widiyanto et al., 2023) confirmed that agroforestry practices on peatlands not only contribute to ecosystem restoration but also open up opportunities for sustainable income diversification for local communities. The utilization and processing of non-timber forest products (NTFPs) can be a sustainable income diversification strategy while strengthening the economic resilience of peatland communities (Hazari et al., 2023) . Agroforestry business models not only support peatland conservation but also open up opportunities for sustainable income diversification for local communities (Applegate et al., 2022) .

The implementation of a green economy has the potential to create new business opportunities. Utilizing peat forests for value-added products such as forest honey, rattan, and medicinal plants can increase community incomes while preserving the ecosystem. This is an important lesson for Central Kalimantan, which has similar ecological characteristics. Studies of stingless bee cultivation in Central Kalimantan's peatlands indicate that stingless bee honey has significant economic potential as an alternative source of income, while also encouraging sustainable environmental management practices (Barbara et al., 2025) . Cultivating stingless bee honey and its derivative products offers significant economic prospects for peatland communities and supports income diversification in line with green economy principles (Kusumawaty et al., 2024) .

However, the literature also highlights various obstacles to implementing a green economy, particularly in rural communities. These obstacles include limited market access, low human resource capacity, and a lack of consistent regional policy support. These factors often leave the green economy merely a discourse without significant implementation at the local level. Therefore, research is needed to examine the real role of the green economy in diversifying livelihoods in Central Kalimantan. Readiness for green economy implementation in Indonesia remains hampered by limited regional capacity, funding, and governance, thus slowing the effective adoption of green practices (Dianjaya & Epira, 2020) . An article (Puteri & Purnomo, 2024) indicates that technical barriers, limited human resources, and weak market infrastructure at the subnational level are key challenges to implementing a sustainable green economy in Indonesia. Limited local capacity, weak cross-actor coordination, and a lack of policy support make it difficult to optimally implement green economy-based interventions in peatland communities.

Theoretically, the relationship between a green economy and livelihood diversification can be explained through a sustainable development perspective. This concept emphasizes that economic activities should not damage ecosystem functions but should support long-term sustainability. Thus, a green economy is expected to contribute to the creation of new, more stable, adaptive, and sustainable livelihoods for peatland communities. A study (Mendham et al., 2024) shows that the success of peatland restoration depends heavily on the ability to create equitable and sustainable alternative livelihoods, despite socio-economic and institutional challenges. Utilizing purun for weaving crafts can be a livelihood diversification strategy rooted in local wisdom while supporting green economy principles in peatlands (Karnisa Goib et al., 2019) .

This research hypothesis can also be derived from literature discussing the link between green innovation and community well-being. Empirical studies in several countries show that the adoption of environmentally friendly technologies, ecosystem-based product development, and sustainable agricultural practices can increase the economic diversification of rural households. Therefore, there is a strong assumption that the green economy plays a significant role in encouraging income diversification in peatland communities. A study (Wu, 2022) demonstrated that the adoption of environmentally friendly agricultural technologies not only increases farmers' income but also encourages the diversification of household economic resources. Furthermore, literature on sustainable peatland management emphasizes the importance of local community involvement. Active community

participation in managing natural resources based on green principles not only strengthens social ownership but also opens up space for local innovation in creating new businesses. This aligns with a community-based approach, which is believed to be more effective than top-down interventions. Community involvement through the concept of "social license" increases the social legitimacy and effectiveness of peatland restoration programs (Wiesner & Dargusch, 2022) .

Based on this review, this study proposes the primary hypothesis that: "The green economy plays a positive role in encouraging livelihood diversification among peatland communities in Central Kalimantan." This hypothesis emphasizes the causal relationship between the implementation of green economy principles and increased diversity in community income sources. By testing this hypothesis, it is hoped that the research will provide empirical evidence to support sustainable development policies in peatland areas.

3. Methodology

This study uses a literature review approach to in-depth examine the role of the green economy in promoting livelihood diversification among peatland communities in Central Kalimantan. This approach was chosen because the research focuses on collecting, analyzing, and synthesizing knowledge from various relevant scientific sources, thus providing a conceptual and theoretical overview of the topic under study. The application of the green economy in peatland restoration significantly increases economic efficiency while supporting the diversification of local community livelihoods (Mendham et al., 2024) .

The primary data sources in this study come from reputable international journals, accredited national journals, academic books, research reports from international institutions such as UNEP, FAO, and the World Bank, as well as official reports from the Indonesian government, such as from BPS, KLHK, and Bappenas. To maintain relevance, the literature used is limited to the last ten years (2015–2025), except for classic literature considered fundamental.

The literature collection process was conducted by searching academic databases such as Google Scholar, Scopus, and ScienceDirect using the keywords: green economy, livelihood diversification, peatland communities, sustainable development, and Central Kalimantan. The search results were then selected based on inclusion criteria, namely literature discussing the green economy, economic diversification, or sustainable development in peat areas or areas with similar characteristics. A study (Nash et al., 2025) shows that the application of local technology by farmers in degraded peatlands can directly increase productivity while supporting community livelihood diversification.

Literature analysis was conducted using a content analysis method that focuses on identifying themes, patterns, and relationships between variables relevant to the research. Secondary data from the literature were then categorized into three main aspects: (1) green economy concepts and practices, (2) livelihood diversification strategies for peatland communities, and (3) the relationship between the two in the context of regional development. CSR programs can encourage community involvement in peatland management while facilitating innovation and diversification of local livelihoods (Gunani et al., 2024) .

The results of this literature synthesis were used to develop a conceptual framework and formulate research hypotheses. Using a literature review approach, this research is expected to strengthen the theoretical foundation for the role of a green economy in supporting the sustainable livelihoods of peatland communities, while also providing academic and practical recommendations for formulating development policies in Central Kalimantan.

4. Results and discussion

The results of the literature review indicate that the implementation of a green economy in peatland areas has significant potential to encourage the diversification of community livelihoods. A study (UNEP, 2019) confirmed that a green economy approach can create new, sustainable jobs, particularly in the forestry, environmentally friendly agriculture, and ecotourism sectors. In Central Kalimantan, this potential aligns with the richness of peatland ecosystems that harbor biodiversity and economically valuable non-timber resources. Innovative and sustainable financing strategies are crucial to ensure the

success of peatland rehabilitation in Central Kalimantan, while simultaneously boosting the economic value of ecosystem restoration (IISD, 2022) . Peatland farming systems in Central Kalimantan face sustainability challenges related to traditional agricultural practices, land use, and environmental impacts, necessitating green economy interventions (Surahman et al., 2018) .

Literature analysis also found that peatland communities that rely on monoculture oil palm plantations or dryland agriculture often face high vulnerability to forest fires, price fluctuations, and environmental degradation (Miettinen et al., 2016) . Livelihood diversification through a green economy, such as the development of locally grown agroforestry, can reduce these risks while expanding household income sources. The implementation of agroforestry systems that integrate perennial crops with native trees in peatlands can improve soil fertility while supporting environmental sustainability and mitigating ecological risks (Wijayanti et al., 2025) .

A green economy can enhance local communities' connectivity with markets for sustainable products. For example, forest honey and rattan products from Kalimantan's peatlands have high added value when managed sustainably. This opens up opportunities for diversification through green value chains that benefit local farmers and artisans. A study (Yunus et al., 2025) emphasized that local socioeconomic conditions significantly influence peatland conservation practices, and utilizing non-timber products such as forest honey and rattan can be an effective strategy to support a green economy.

From a socio-economic perspective, green economy-based diversification also strengthens community resilience. Income diversification serves as an adaptive strategy to economic uncertainty. In the context of Central Kalimantan's peatlands, implementing green businesses such as Dayak culture-based ecotourism and utilizing local medicinal plants has the potential to increase income sources without damaging the ecosystem. Educating the younger generation about traditional medicinal plants plays an important role in preserving local knowledge while encouraging the use of a green economy in Central Kalimantan (Novaryati et al., 2021) .

However, the literature also highlights a number of structural barriers. Low access to capital, limited access to environmentally friendly technologies, and weak integration of regional development policies are key challenges. These barriers demonstrate that while a green economy has significant potential, its implementation requires regulatory support, community support, and multi-stakeholder collaboration to achieve optimal results. The transition to a green economy faces complex challenges, including radical technological change, diffuse environmental risks, green capitalism, the role of the state in policymaking, and the unequal distribution of impacts (Söderholm, 2020) . Implementation of a green economy in Indonesia is hampered by weak policy integration and limited access to funding, necessitating multi-stakeholder coordination and support (Kartika et al., 2023) .

The literature review also reveals the importance of environmental education and green literacy. Communities with a better understanding of the benefits of conservation tend to adopt green economy practices more quickly. In Central Kalimantan, community-based education programs can accelerate the transformation towards sustainable livelihood diversification. The implementation of a community-based green school model can significantly increase environmental awareness and encourage sustainable livelihood diversification in rural areas such as Central Kalimantan (Eshteiwy, 2025) . A study by Setiyadi et al., 2023, showed that increased environmental literacy directly drives the adoption of green economy practices in Central Kalimantan communities.

In addition to social aspects, the ecological dimension also provides important supporting evidence. A green economy based on peat restoration has been shown to reduce the risk of forest fires and improve land quality. With improved land conditions, communities have greater opportunities to develop sustainable agricultural activities, thus enabling long-term income diversification. Peat ecosystem restoration in Central Kalimantan not only improves land quality but also plays a crucial role in reducing carbon emissions and supporting a sustainable green economy (Istighfaroh et al., 2024) . An article (Jalilov et al., 2025) shows that peat restoration in Indonesia, including Central Kalimantan, provides significant economic benefits by minimizing losses from land fires and increasing land productivity.

Empirical evidence from studies in peatland areas in Riau and West Kalimantan shows that implementing green businesses, such as freshwater fish farming in restoration canals and processing non-timber commodities, can increase income by up to 30% compared to a single palm oil-based

business model. These findings illustrate that green economy-based diversification is not only theoretical but also practically proven. The implementation of a community-based adaptive business model in peatland restoration in Riau and West Kalimantan can effectively increase community income through green businesses (Puspitaloka et al., 2024) . Peatland restoration in Riau and West Kalimantan not only plays a role in climate change mitigation but also supports the development of sustainable green businesses (Choy & Onuma, 2025) . Research (Jaya et al., 2022) shows that implementing agroforestry systems in Central Kalimantan can increase farmer incomes while supporting peatland conservation and rehabilitation.

However, the effectiveness of a green economy in promoting diversification is also significantly influenced by policy support. According to Bappenas (2021) , successful implementation of a green economy requires cross-sector integration between the government, the private sector, and civil society. If Central Kalimantan's regional policies can incorporate green principles into development planning, the opportunity for inclusive diversification will be greater. Integrating a green development perspective into regional government policies, including in Central Kalimantan, requires cross-sector coordination to encourage sustainable economic diversification (Hidayaturahmi, 2020) .

Table 3: Summary of Literature Findings on Green Economy in Central Kalimantan Peatlands

Study Aspects		Key Findings	Source
Green Economy Potential		Livelihood diversification (environmentally friendly agriculture, sustainable forestry, ecotourism, agroforestry, non-timber products)	UNEP (2019), Wijayanti et al. (2025), Yunus et al. (2025)
Challenge		Dependence on monoculture, price fluctuations, land degradation, peat fires	Miettinen et al. (2016), Surahman et al. (2018)
Strategy		Ecosystem restoration, agroforestry, utilization of local products (rattan, honey, medicinal plants), cultural ecotourism	Novaryatiin et al. (2021), Istighfaroh et al. (2024)
Obstacle		Low access to capital, limited technology, weak integrated policies	Söderholm (2020), Kartika et al. (2023)
Key Support		Cross-sectoral policies, green literacy, community-based environmental education	Bappenas (2021), Setiyadi et al. (2023), Eshteiwy (2025)
Empirical Evidence		Green business (restoration canal fish, non-timber commodities) increases income by up to 30%	Puspitaloka et al. (2024), Choy & Onuma (2025)

Source: National, International Journals, Books, and Articles (2016-2025) Data Processed

The literature review indicates that the green economy plays a significant role in encouraging livelihood diversification in peatland communities in Central Kalimantan. However, this potential can only be optimally realized if supported by supporting factors such as consistent policies, increased community capacity, access to green markets, and peatland ecosystem restoration. Thus, this study confirms that the green economy is not only a global paradigm but also a local solution for achieving sustainable development in peatland areas.

5. Conclusion

5.1. Conclusion

This study concludes that the green economy plays a crucial role in encouraging livelihood diversification in peatland communities in Central Kalimantan. Through sustainability principles, the green economy opens up alternative business opportunities, such as agroforestry, ecotourism, and the use of non-timber forest products, which can increase income while preserving peatland ecosystems. Thus, the study's objective of understanding the link between the green economy and income diversification in peatland communities has been achieved through literature analysis.

5.2. Limitations

While this study provides a comprehensive overview, there are limitations worth noting. First, the study is solely a literature review and therefore does not present more detailed field data on the socio-economic conditions of peatland communities in Central Kalimantan. Second, the limited literature specifically addressing the green economy in the local context of Central Kalimantan means that some of the analysis relies on comparisons with other regions. This may limit the generalizability of the findings to local empirical conditions.

5.3. Suggestions

Based on these findings and limitations, further research is recommended to conduct field studies using both quantitative and qualitative approaches to more deeply describe the socio-economic realities of peatland communities. Furthermore, it is crucial for local governments to strengthen green development policies that encourage community participation, market access, and capital support for environmentally friendly businesses.

Educational institutions and civil society organizations are also advised to improve community green literacy through training and mentoring. This capacity building is expected to accelerate the adoption of green economy practices and strengthen community resilience to environmental and market challenges.

Overall, the results of this study confirm that a green economy is not only a global concept but also a local solution that can integrate environmental sustainability with the well-being of Central Kalimantan's peatland communities. With policy support, multi-stakeholder collaboration, and further research, green economy-based livelihood diversification could be an effective strategy for sustainable development in this region.

Confession

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