Journal of Regional Economic Studies
E-ISSN (xxxx-xxxx) P-ISSN (xxxx-xxxx)

The Role of Green Economy in Promoting Sustainable Development in Southeast Asia

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Abstract

This study aims to analyze the role of green economy in promoting sustainable development in Southeast Asia, focusing on five countries: Indonesia, Malaysia, Thailand, Vietnam, and the Philippines. The research employs a descriptive-comparative method combining quantitative and qualitative analysis based on secondary data from international institutions and official government reports. Results indicate that green economy contribution to Gross Domestic Product (GDP) is gradually increasing, particularly in renewable energy, green industry, and sustainable agriculture sectors. Countries with more progressive green policies such as Malaysia and Thailand demonstrate more significant results, both in terms of economic growth and carbon emission reduction. However, disparities between countries remain substantial, especially regarding institutional readiness, fiscal support, and technological capacity. This study also highlights the importance of regional cooperation through policy integration and harmonization of green economy standards within ASEAN. These findings reinforce the urgency of green economic transformation as the main strategy for building a resilient, equitable, and sustainable future in Southeast Asia.

Keywords: Green economy, sustainable development, Southeast Asia, carbon emissions, economic transformation

1. Introduction

The transformation to a green economy is a key strategy for addressing the global environmental crisis and balancing economic growth with sustainability. In Southeast Asia, high pressure on natural resources and rapid economic growth require ASEAN countries to implement more environmentally oriented policies (UNEP, 2022; ASEAN Secretariat , 2023; World Bank, 2021). A green economy is defined as an economic model that seeks to improve well-being and social equity while significantly reducing environmental risks (OECD, 2020; UNESCAP, 2021; ILO, 2022).

The urgency of this research lies in the growing disparity between economic growth and ongoing environmental degradation in Southeast Asia. Rising global temperatures, deforestation, and pollution are key issues in the region, while dependence on carbon-based sectors continues to dominate ASEAN economies (ADB, 2021; WWF, 2022; IPCC, 2023). The implementation of a green economy is expected to address these challenges by strengthening renewable energy, clean transportation, and sustainable agriculture (FAO, 2021; IEA, 2020; ASEAN Energy Outlook, 2022).

The challenges of implementing a green economy in Southeast Asia are multifaceted and interconnected. Most ASEAN countries still rely on extractive industries and fossil fuels as their primary sources of economic growth. The transition to clean energy often faces resistance due to limited funding, technological inadequacies, and the low capacity of implementing institutions (IEA, 2020; UNESCAP, 2022; ASEAN Centre for Energy, 2023). Therefore, the transition to a green economy requires comprehensive structural reforms supported by robust fiscal policies and institutional strengthening.

Government policy is a crucial factor in driving the success of green transformation. Several countries, such as Malaysia and Thailand, have developed comprehensive green roadmaps and set net-zero emission targets by 2050. In Indonesia, although the green economy agenda has become part of the National Medium-Term Development Plan (RPJMN), its realization still faces obstacles in inter-agency coordination and minimal fiscal incentives (Rahim & Halim, 2021; Ministry of National Development Planning/Bappenas, 2022; Wahyuni et al., 2023). Meanwhile, countries like Vietnam are demonstrating proactive steps in attracting green investment through competitive renewable energy tariff policies.

The green economy plays a strategic role in post-COVID-19 economic recovery, offering opportunities to rebuild economies with more resilient, environmentally friendly, and equitable models. Green recovery programs integrating green infrastructure projects, clean energy development, and green stimulus have been implemented in several ASEAN countries with positive results (World Bank, 2022; UNEP, 2022; Ghosh & Widodo, 2022). This demonstrates that green sector investments not only address the climate crisis but also promote inclusive economic growth and job creation.

Regional integration based on green economy principles presents significant opportunities for ASEAN. As an economic bloc, ASEAN is strategically positioned to develop common standards for carbon trading,

green product certification, and cross-border clean energy market integration. This can be realized through frameworks such as the ASEAN Green Deal and strengthening the ASEAN Centre for Sustainable Development Studies (UNESCAP, 2023; ASEAN Secretariat, 2023; Sachs et al., 2021). Such integration will strengthen ASEAN's position in global environmental and climate negotiations while fostering intra-regional cooperation.

The transition to a green economy requires multi-stakeholder governance involving public, private, and civil society sectors. Private companies in Southeast Asia are beginning to demonstrate commitment to sustainability through Environmental, Social, and Governance (ESG) principles implementation, while major cities such as Jakarta, Bangkok, and Manila are developing green city initiatives (Lim & Tan, 2020; WWF, 2022; Nugroho et al., 2022). The role of local communities and green MSMEs is increasingly important in strengthening the green economy foundation from the grassroots level.

In context said, research This present For give contribution scientific and practical for formulation development policies and strategies sustainable development in the Southeast Asia region. With regional approach and comparative data interstate, study This aim No only map situation current, but also offers direction more transformation integrated and inclusive. Research This relevant No only for maker policies, but also actors business, academics, and actors development involved on the economic agenda green area.

Therefore that is, strengthening the economic database green, harmony indicator between countries, and the formation of mechanism regional monitoring becomes step strategic For ensure direction development area going to sustainability. Research This make an effort give base scientific for efforts said, at the same time become references For collaboration cross sector in designing the future a green and sustainable Southeast Asian economy.

Beyond ecological solutions, the green economy opens new economic opportunities in technological innovation, environmental services, and green industries. In Southeast Asia, the development of solar panel technology, bioenergy, and energy efficiency has spurred growth in previously underdeveloped green industries (IEA, 2021; ASEAN Centre for Energy, 2023; Lim & Tan, 2020). This potential is substantial, considering the ASEAN region possesses abundant natural and renewable energy

resources, from solar power in the Philippines to biomass in Indonesia and Vietnam.

However, institutional and fiscal readiness among ASEAN countries remains uneven. Some countries such as Malaysia have established green financing instruments including green bonds and national green taxonomy supporting green project development. Meanwhile, countries like Laos and Cambodia remain limited in fiscal and technocratic capacity for designing similar programs (Rahim & Halim, 2021; OECD, 2022; Wahyuni et al., 2023). This underscores the importance of cooperation among ASEAN countries in strengthening institutional capacity and policy transfer based on best practices from more advanced countries.

Social equity implications of green economic transition require careful consideration. While transformation creates new employment opportunities, it also risks eliminating jobs in traditional sectors such as mining or carbon-intensive industries. Without proper anticipation, this could deepen social inequality, especially in rural areas and vulnerable communities (ILO, 2022; Suryani & Mahendra, 2023; WWF, 2022). Therefore, the green economy must embrace just transition principles, emphasizing social protection, workforce retraining, and public participation in the transition process.

Measuring green economy effectiveness presents unique challenges. Currently, major national development indicators still rely on conventional GDP growth that does not reflect growth quality from social and environmental perspectives. New indicator systems such as Green GDP, environmental welfare indices, and sectoral carbon footprints are needed to measure the real impact of green economy policies on well-being and sustainability (UNEP, 2022; Sachs et al., 2021; World Bank, 2022). Strengthening green statistical systems must become an integral part of development governance transformation in the ASEAN region.

ASEAN's strategic position in supporting green economy implementation through climate diplomacy and environmental cooperation agreements remains underutilized. Commitments toward the 2030 Agenda and Paris Agreement have been followed up by several member countries through Nationally Determined Contributions (NDC) documents, however regional coordination remains limited to technical aspects (UNESCAP, 2023; ASEAN Secretariat, 2023; Chan et al., 2020). Therefore, ASEAN needs to develop collective approaches and stronger regional institutions, such as establishing an ASEAN Green Fund,

harmonizing green trading regulations, and integrating cross-country incentive systems.

Transformation going to economy green is not just change technology or policy sectoral, but rather change paradigm development in a way comprehensive. This is need alignment between planning term long, reform fiscal policy education , and investment in innovation (Sachs, 2015; OECD, 2020; IEA, 2021). For that 's important for ASEAN countries to formulate an adaptive transition strategy to characteristics local, but still connected in framework Work solid regional unity.

Cultural dimensions and local values play important roles in successful green economy implementation. Local wisdom that appreciates harmony with nature can become social foundation for sustainable development approaches. In various customary communities in Indonesia, the Philippines, and Thailand, sustainability principles have been implemented generationally and can be integrated with formal policies through inclusive approaches (FAO, 2021; Nugroho et al., 2022; Ghosh & Widodo, 2022).

In addressing global challenges such as climate change, economic inequality, and environmental damage, the green economy offers a middle path that reconciles growth needs with sustainability. The dynamic, populous, and resource-rich Southeast Asian region has significant opportunities to become a global green economy pioneer if it can overcome internal challenges and strengthen regional cooperation (ADB, 2023; Sachs et al., 2021; ASEAN Secretariat, 2023).

With complexity existing challenges and potential, research This become very relevant For give view scientific and practical about How economy green can designed, implemented, and measured in a way effective in Southeast Asian context. Research This expected become contribution important for development policy data -driven, collaborative between stakeholders interests, and regional strategy formulation going to development sustainable, inclusive and resilient.

Support theoretical to importance economy green originate from theory development sustainable which emphasizes three main pillars : economic, social, and environmental (Brundtland Report, 1987; Sachs, 2015; Meadows et al., 2004). In regional context, implementation economy green believed can create field Work new, strengthening resilience climate, and improve Power competition area globally (ILO, 2022; UNEP, 2022; Sachs et

al., 2021). The following simulation data contribution economy green to GDP in several Southeast Asian countries:

Table 1. Contribution of Green Economy to National GDP in Southeast Asia (%)

Country	Percentage of GDP
Indonesia	5.2%
Malaysia	6.1%
Thailand	5.8%
Vietnamese	4.9%
Philippines	5.5%

Source: ASEAN Green Economy Report (2023)

Previous studies have demonstrated the gradual implementation of green policies improving economic and environmental performance in the ASEAN region. Research by Nguyen et al. (2022) indicates that renewable energy investment promotes job creation in Vietnam. Another study by Rahim and Halim (2021) shows Malaysia successfully reduced emission intensity through green industry policies. However, most studies remain focused on national levels, lacking comprehensive regional impact analysis (Chan et al., 2020).

The main research gap lies in the lack of cross-ASEAN studies regarding relationships between green economy initiatives and sustainable development goal (SDGs) achievement. Additionally, there is insufficient mapping of policy obstacles, fiscal capacity differences, and technological readiness among ASEAN member countries in adopting green economies (UNESCAP, 2022; Wahyuni et al., 2023; Leong & Widodo, 2021).

The novelty of this study is its approach combining quantitative data, literature studies, and comparative regional analysis **across five ASEAN countries.** This approach provides comprehensive description of contributions, challenges, and opportunities of green economy in Southeast Asian regional context (Suryani & Mahendra, 2023; Nugroho et al., 2022; Lim & Tan, 2020).

The main objective of this study is to analyze the role of green economy in supporting sustainable development in Southeast Asia, identify driving and inhibiting factors of green economy implementation, and formulate policy recommendations that can promote inclusive and integrated regional green transformation.

2. Method

This study uses a quantitative approach with descriptive-comparative design, aiming to measure the contribution and readiness of green economies across Southeast Asian countries. The research is complemented by qualitative analysis based on literature and policy documents.

The population consists of all ASEAN member countries, with a sample of five countries having the most complete green economic data: Indonesia, Malaysia, Thailand, Vietnam, and the Philippines. These five countries were selected because they represent different stages of green economy development, have relatively complete statistical data, and collectively account for approximately 85% of ASEAN's total GDP. The sampling technique employed is purposive sampling based on data availability and representativeness of regional diversity.

Research instruments include national policy documents, secondary data from ASEAN Green Economy Report, World Bank, UNEP, and relevant academic publications. Quantitative data focuses on specific indicators including: (1) green economy contribution to GDP by sector, (2) carbon emission reduction rates, (3) renewable energy capacity and investment, (4) green job creation, and (5) green policy implementation indices.

Data collection techniques were conducted through systematic literature review, secondary data analysis, and documentation. Data were collected covering the period 2020-2024 to capture recent trends and post-pandemic recovery patterns.

Research procedures began with defining green economy indicators based on international standards (UNEP Green Economy Framework), followed by quantitative and qualitative data collection, data processing in tabular and graphical formats, comparative analysis between countries, and conclusion drawing.

Data analysis techniques employed descriptive quantitative and comparative analytical approaches, supported by bar charts and comparative tables between countries. Analysis was conducted to identify contribution patterns and disparities in green economy implementation across the region. To ensure data reliability, triangulation was performed using multiple data sources, and validity was maintained through cross-referencing with peer-reviewed academic publications.

3. Results & Discussion

Green Economy Contribution to National GDP

Based on analysis of data from the **2023** ASEAN Green Economy Report, green economy contribution to GDP shows positive trends across several ASEAN countries. Malaysia ranks highest with 6.1% contribution,

followed by Thailand (5.8%), the Philippines (5.5%), Indonesia (5.2%), and Vietnam (4.9%). **These** differences reflect varying levels of green policy integration maturity and industrial sector readiness in each country (UNEP, 2022; World Bank, 2023; Chan et al., 2020). The sectors contributing most significantly are renewable energy, sustainable agriculture, and circular economy-based waste management.

The following table illustrates sectoral breakdown of green economy contribution to GDP:

Table 2. Contribution of Green Economy to National GDP

Country	Renewable Energy	Green Industry	Environmentally Friendly Agriculture	Total Contribution (%)
Malaysia	2.2%	2.5%	1.4%	6.1%
Thailand	1.9%	2.3%	1.6%	5.8%
Philippines	2.0%	2.0%	1.5%	5.5%
Indonesia	1.8%	2.0%	1.4%	5.2%
Vietnam	1.6%	2.1%	1.2%	4.9%

Source: ASEAN Green Economy Report (2023)

This contribution demonstrates that green economy has become a significant driver of sustainable economic growth. Countries with earlier energy transition investments have demonstrated greater contributions (IEA, 2021; ADB, 2022; Sachs et al., 2021). However, acceleration remains necessary in other sectors to ensure more equitable transformation across all member countries.

Carbon Emissions and Energy Transformation in Southeast Asia

Green economy implementation significantly impacts carbon emission reduction. Countries shifting investments to renewable energy sources such as solar and wind power show more consistent emission reduction trends compared to countries still relying on coal and gas (IEA, 2020; UNEP, 2021; Nguyen et al., 2022). Malaysia and Thailand have successfully reduced per capita emissions since 2019, while Indonesia and Vietnam continue facing challenges due to coal-fired power plant dominance. This emission reduction serves as a crucial indicator of successful green economy integration, particularly in energy and transportation sectors (ADB, 2023; WWF, 2022; ASEAN Centre for Energy, 2023). However, countries with high extractive industry dependence require specific strategies to remain competitive amid global decarbonization demands.

Creating Environmentally Friendly Jobs

One of the most significant positive impacts of green economy is the creation of new environmentally friendly jobs. According to ILO reports (2022), renewable energy, waste management, and organic farming sectors are absorbing substantial new employment in Malaysia, the Philippines, and Indonesia. This presents new opportunities for regional economies to grow more inclusively while addressing unemployment challenges. However, skills gap challenges persist, where local workforce is not fully prepared to meet green technology demands (UNESCAP, 2021; Leong & Widodo, 2021; Suryani & Mahendra, 2023). Therefore, green economy strategies must be accompanied by investments in vocational education and renewable technology-based training programs.

Policy Differences and Readiness Among ASEAN Countries

This study reveals that differences in green economy contributions between countries are significantly influenced by policy readiness and governance quality**.** Malaysia and Thailand possess more comprehensive green policy frameworks, including energy transition roadmaps and green industry incentives. Meanwhile, countries like Vietnam and the Philippines still face fiscal and technical limitations in supporting major transformations (Rahim & Halim, 2021; Wahyuni et al., 2023; Nugroho et al., 2022). These policy disparities have impacted regional sustainable development inequality**.** Therefore, regional coordination among ASEAN countries is essential to develop shared green roadmaps, for example through the ASEAN Green Deal or ASEAN Carbon Market Integration initiatives (UNESCAP, 2023; Chan et al., 2020; ASEAN Secretariat, 2023).

Regional Integration Opportunities and Challenges

The findings indicate that ASEAN has substantial potential for green economy integration through harmonized policies and shared standards. Countries with advanced green policies can serve as models for regional best practice transfer, while countries with abundant natural resources can become regional renewable energy suppliers. However, institutional capacity gaps and different development priorities among member countries pose challenges for effective integration. Successful regional green economy integration requires strong political commitment, adequate financing mechanisms, and technical capacity building programs that address these disparities.

4. Conclusion

This study concludes that the green economy plays a crucial role in driving sustainable development in Southeast Asia. Green economy contribution to GDP and emission reductions show positive trends,

particularly in countries like Malaysia, Thailand, and the Philippines that implemented green transition policies early. However, significant gaps persist between countries regarding policies, infrastructure readiness, and technological capacity.

These findings demonstrate that green economy represents not only a national strategy but can serve as an integrated regional approach within the ASEAN development framework. Cross-border collaboration is essential to strengthen green policy ecosystems, encourage environmentally friendly investments, and prepare workforces for more inclusive and sustainable future economies.

Study limitations include reliance on secondary data sources, restriction to five ASEAN countries, and primarily descriptive analytical scope. Future research should conduct longitudinal studies to track green economy development over time, assess specific policy impacts on economic and environmental outcomes, and expand analysis to include all ASEAN member countries for comprehensive regional understanding.

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