

## **Sustainable Economy and Green Development Challenges in ASEAN**

Ha Dai Sinh<sup>1</sup>

<sup>1</sup>Faculty of International Business and Economics, Vietnam National University, Vietnam

Received: September 4, 2025

Revised: September 25, 2025

Accepted: October 28, 2025

### **Abstract**

This study examined the challenges of developing a sustainable economy and promoting green development in the Association of Southeast Asian Nations (ASEAN) through a comprehensive literature review. ASEAN has experienced rapid economic growth over recent decades; however, this growth has been accompanied by increasing environmental degradation, climate vulnerability, and social inequality. These conditions have intensified the need for development pathways that balance economic progress with environmental protection and social inclusion. By synthesizing academic studies, policy documents, and reports from international and regional institutions, this study identified the key factors shaping sustainable economy outcomes in the ASEAN region. The findings revealed that environmental pressures, including climate change impacts, pollution, and resource depletion, pose significant risks to long-term economic stability. Economic and financial constraints, such as high costs of green technologies, limited access to green finance, and dependence on carbon-intensive industries, further hinder green development efforts. Institutional and governance challenges, including fragmented policymaking, weak regulatory enforcement, and uneven implementation of regional initiatives, were also found to limit progress. In addition, social dimensions particularly employment transitions, inequality, and limited public participation play a critical role in determining the inclusiveness and effectiveness of green development strategies. While ASEAN regional cooperation frameworks demonstrate strong collective commitment to sustainability, their impact remains constrained by varying national capacities and the principle of non-interference. Overall, this study highlights the need for integrated policy approaches, strengthened institutional capacity, inclusive social strategies, and enhanced regional cooperation to advance a sustainable economy and green development in ASEAN.

**Keywords:** Sustainable Economy, Green Development, ASEAN, Environmental Sustainability, Regional

### **Introduction**

Sustainable economic development has emerged as one of the most critical global priorities in the twenty-first century, particularly in regions experiencing rapid economic growth alongside increasing environmental pressures. The Association of Southeast Asian Nations (ASEAN), comprising ten diverse member states with varying levels of development, has been at the center of this global sustainability discourse. Over recent decades, ASEAN economies have achieved significant growth driven by industrialization, urbanization, trade liberalization, and foreign direct investment (Jermstiparsert, 2021).

However, this growth trajectory has also resulted in escalating environmental degradation, rising greenhouse gas emissions, resource depletion, and widening social inequalities, raising serious concerns about the long-term sustainability of economic progress in the region. The concept of a sustainable economy emphasizes the integration of economic growth, environmental protection, and social equity to ensure development that meets present needs

without compromising the ability of future generations to meet their own needs (Ali et al., 2024).

Within this context, green development has been widely promoted as a strategic approach to address environmental challenges while maintaining economic competitiveness. Green development involves the adoption of low-carbon technologies, efficient resource management, renewable energy utilization, and environmentally responsible production and consumption patterns (Khan et al., 2022). For ASEAN countries, green development has been increasingly framed not only as an environmental necessity but also as an economic opportunity to foster innovation, enhance resilience, and attract sustainable investment (Chien et al., 2023).

Despite growing recognition of sustainability imperatives, ASEAN faces distinct and complex challenges in transitioning toward a sustainable economy. The region is highly vulnerable to climate change impacts, including rising sea levels, extreme weather events, and biodiversity loss, which disproportionately affect coastal areas, agriculture, and urban infrastructure (Roy et al., 2023). Many ASEAN member states are among the most climate-vulnerable countries globally, with significant portions of their populations and economic activities concentrated in low-lying coastal zones. These environmental risks pose direct threats to economic stability, food security, and social welfare, underscoring the urgency of sustainable and green development pathways.

Economic structure further complicates sustainability efforts in ASEAN. Several member states continue to rely heavily on resource-intensive industries, fossil fuels, and export-oriented manufacturing sectors that contribute significantly to environmental pollution (Qudrat, 2024). While some countries, such as Singapore and Malaysia, have made progress in adopting green technologies and policies, others face constraints related to limited financial resources, technological capacity, and institutional readiness. This uneven level of development creates disparities in the ability of ASEAN countries to implement sustainability initiatives effectively and equitably.

Tanjung & Shimada (2025) said that, Institutional and governance challenges also play a critical role in shaping sustainable economy outcomes in ASEAN. The literature has highlighted issues such as fragmented policymaking, weak regulatory enforcement, and insufficient coordination among government agencies as persistent barriers to green development. Although ASEAN has introduced various regional frameworks and action plans aimed at promoting sustainable development, the principle of non-interference and the diversity of national priorities often limit the effectiveness of collective implementation. As a result, sustainability policies are frequently implemented unevenly across the region, reducing their overall impact.

Social dimensions of sustainability further complicate the green development agenda. The transition toward a green economy can generate social challenges, particularly for workers and communities dependent on carbon-intensive industries. Without adequate social protection, skills training, and inclusive policy design, green transitions risk exacerbating unemployment, income inequality, and social exclusion. In ASEAN, where informal employment remains widespread and social safety nets are often limited, these social risks require careful consideration within sustainability strategies.

At the regional level, ASEAN has increasingly positioned sustainable development as a core pillar of its long-term vision (Zhou et al., 2025). Initiatives such as the ASEAN Community Vision 2025 and the ASEAN Socio-Cultural Community Blueprint emphasize environmental sustainability, climate resilience, and inclusive growth. These commitments align with global

agendas such as the United Nations Sustainable Development Goals (SDGs), reinforcing ASEAN's role in contributing to global sustainability efforts. However, translating these high-level commitments into concrete outcomes remains a significant challenge, particularly given the region's economic diversity and institutional constraints.

Given these complexities, a comprehensive understanding of sustainable economy and green development challenges in ASEAN is essential. Existing studies have examined various aspects of sustainability in the region, yet findings remain fragmented across disciplines, countries, and thematic focuses. A synthesized perspective is therefore necessary to capture the multifaceted nature of sustainability challenges and to inform more coherent policy and research directions. By critically examining the existing body of knowledge, this study contributes to a deeper understanding of how economic growth, environmental protection, and social development intersect within the ASEAN context.

## **Methods**

### **Research Design**

This study employed literature review design to examine the concept of sustainable economy and green development challenges in ASEAN. The literature review approach was selected because it enabled a comprehensive synthesis of existing academic knowledge, policy discussions, and empirical findings related to sustainability in the region. Rather than generating primary data, the study focused on critically analyzing and integrating insights from previously published research to develop a coherent understanding of prevailing challenges, trends, and gaps. This design was particularly appropriate given the multidimensional nature of sustainable development, which spans economic, environmental, social, and institutional dimensions across diverse national contexts within ASEAN.

### **Scope and Focus of the Review**

The scope of the literature review was defined to ensure relevance and analytical depth. The study focused on ASEAN member states and examined literature addressing sustainable economy, green development, environmental sustainability, climate policy, green finance, and inclusive growth within the region. Both regional-level and country-specific studies were included to capture variations in development levels and policy approaches. The review emphasized publications released within the last fifteen years to reflect contemporary sustainability challenges and policy dynamics, while seminal earlier works were included where necessary to provide foundational context.

### **Data Sources**

The literature reviewed in this study was drawn from multiple credible sources to ensure comprehensive coverage and reliability. Academic journal articles were collected from major scholarly databases such as Scopus, Web of Science, and Google Scholar. In addition, reports and publications from reputable international and regional organizations including the ASEAN Secretariat, World Bank, Asian Development Bank (ADB), United Nations Development Programme (UNDP), United Nations Environment Programme (UNEP), and International Energy Agency (IEA) were included. These institutional sources were particularly valuable for understanding policy frameworks, regional initiatives, and empirical assessments related to sustainability and green development in ASEAN.

### **Inclusion and Exclusion Criteria**

Clear inclusion and exclusion criteria were applied to maintain consistency and quality in the reviewed literature. Studies were included if they explicitly addressed sustainable economy, green growth, environmental policy, or related challenges within ASEAN or its member states.

Peer-reviewed journal articles, authoritative books, and institutional reports written in English were prioritized. Publications that lacked a clear ASEAN focus, were opinion-based without analytical grounding, or originated from non-credible sources were excluded. This filtering process ensured that the review was based on rigorous, relevant, and verifiable evidence.

### **Literature Selection Process**

The literature selection process followed a structured and systematic approach. Initial keyword searches were conducted using terms such as “sustainable economy,” “green development,” “green growth,” “environmental sustainability,” and “ASEAN.” The search results were screened in multiple stages. First, titles and abstracts were reviewed to assess relevance. Second, full-text reviews were conducted for selected studies to evaluate their contribution to the research focus. Duplicates and irrelevant studies were removed during this process. The final set of literature represented a balanced mix of theoretical discussions, empirical studies, and policy analyses.

### **Data Analysis Technique**

The selected literature was analyzed using thematic analysis. This approach involved identifying recurring themes, patterns, and relationships across the reviewed studies. The analysis focused on categorizing challenges related to sustainable economy and green development into major thematic areas, such as environmental constraints, economic and financial barriers, institutional and governance issues, and social implications. Through iterative reading and comparison, similarities and differences across countries and studies were examined, allowing for a synthesized interpretation of the main challenges facing ASEAN.

### **Synthesis and Interpretation**

Following thematic categorization, the findings were synthesized to construct an integrated narrative of sustainable economy and green development challenges in ASEAN. Rather than summarizing individual studies in isolation, the synthesis emphasized cross-study comparisons and broader regional insights. This interpretive process enabled the identification of converging perspectives as well as areas of divergence within the literature. The synthesis also facilitated the identification of research gaps and underexplored issues, contributing to a more comprehensive understanding of the subject.

### **Validity and Reliability**

To enhance the validity and reliability of the study, several strategies were applied. The use of multiple data sources helped reduce source bias and strengthened the robustness of the findings. Preference was given to peer-reviewed and institutional publications with established credibility. Additionally, consistent inclusion criteria and a transparent selection process ensured methodological rigor. By systematically analyzing a broad body of literature, the study aimed to provide a reliable and well-grounded assessment of sustainability challenges in ASEAN.

### **Results and Discussion**

This section presents the findings derived from the systematic analysis of the selected literature on sustainable economy and green development in ASEAN. The results are organized thematically to reflect the major issues and patterns that emerged across the reviewed studies. By synthesizing evidence from academic research and institutional reports, this section highlights the key challenges influencing sustainability outcomes in the region. The findings provide a structured overview of environmental, economic, institutional, social, and regional dimensions, forming a coherent basis for understanding the complexities of sustainable development in the ASEAN context.

## **Environmental Sustainability Challenges**

The literature consistently identified environmental sustainability challenges as a fundamental obstacle to achieving a sustainable economy in ASEAN (Herrador & Van, 2024). Rapid economic growth, urbanization, and industrial expansion have significantly intensified environmental pressures across the region. Key challenges include air and water pollution, deforestation, land degradation, and biodiversity loss, particularly in countries with large agricultural and extractive sectors. These environmental issues not only threaten ecological systems but also undermine economic productivity, public health, and long-term development prospects.

Climate change emerged as one of the most critical environmental challenges facing ASEAN. Many member states are highly vulnerable to climate-related risks such as rising sea levels, flooding, droughts, and extreme weather events. Coastal and low-lying areas, which host a large share of the population and economic activity, are especially exposed to these risks. The literature highlighted that climate impacts pose direct threats to agriculture, fisheries, infrastructure, and tourism, increasing economic uncertainty and development costs across the region.

Another major environmental challenge identified was unsustainable natural resource management. Several ASEAN countries continue to depend heavily on natural resource extraction, including forestry, mining, and fossil fuels, to support economic growth. Weak enforcement of environmental regulations and illegal exploitation of resources exacerbate environmental degradation. The literature emphasized that overexploitation of natural resources not only accelerates ecological damage but also reduces the long-term availability of resources essential for sustainable economic development.

The findings further indicated that limited environmental governance capacity constrains effective responses to these challenges. Insufficient monitoring systems, inadequate environmental data, and limited technical expertise hinder evidence-based policymaking. In addition, environmental policies are often implemented in isolation from economic and social policies, reducing their overall effectiveness. The literature suggested that addressing environmental sustainability challenges in ASEAN requires stronger regulatory frameworks, improved environmental management capacity, and greater integration of environmental considerations into broader development strategies.

## **Economic and Financial Constraints**

The literature consistently identified economic and financial constraints as major barriers to advancing a sustainable economy and green development in ASEAN (Al-Masri & Ibrahim, 2025). One of the most prominent challenges highlighted was the high initial cost associated with green technologies, renewable energy systems, and environmentally sustainable infrastructure. Many ASEAN countries, particularly developing and lower-income member states, face fiscal limitations that restrict public investment in large-scale green projects. As a result, sustainability initiatives often compete with more immediate development priorities such as poverty reduction, infrastructure expansion, and economic recovery, making long-term green investments less politically and economically attractive.

In addition to budgetary limitations, the reviewed studies emphasized the underdevelopment of green finance mechanisms across much of the region. While green bonds, sustainable loans, and climate finance instruments have gained traction globally, their adoption in ASEAN

remains uneven. Financial markets in several member states lack the regulatory frameworks, technical expertise, and risk assessment tools necessary to support sustainable finance at scale. This limits the participation of private investors and financial institutions in green development initiatives, thereby increasing reliance on public funding and international assistance.

The literature also pointed to structural economic dependencies as a significant financial constraint. Many ASEAN economies continue to rely heavily on carbon-intensive industries such as fossil fuels, manufacturing, mining, and resource extraction for economic growth, employment, and export revenues. Transitioning away from these sectors poses economic risks, including potential revenue losses, job displacement, and reduced competitiveness in the short term. Consequently, governments often adopt cautious approaches toward sustainability reforms, slowing the pace of green economic transformation.

Finally, disparities in economic development among ASEAN member states further complicate regional sustainability efforts. More advanced economies possess greater fiscal capacity, technological access, and institutional readiness to invest in green development, while less developed countries face limited financial resilience and higher vulnerability to external shocks. These inequalities create uneven progress toward sustainable economy goals across the region. The literature suggested that without targeted financial support, capacity-building initiatives, and regional financing mechanisms, economic and financial constraints will continue to hinder a cohesive and inclusive green development pathway in ASEAN.

### **Institutional and Governance Issues**

The literature widely recognized institutional and governance issues as critical factors influencing the effectiveness of sustainable economy and green development efforts in ASEAN (Sadiq et al., 2023). One of the most frequently cited challenges was the fragmentation of policy frameworks across sectors and levels of government. Sustainability-related responsibilities are often dispersed among multiple ministries and agencies, leading to overlapping mandates, policy inconsistencies, and weak coordination. This fragmentation reduces policy coherence and undermines the integration of environmental objectives into broader economic planning and development strategies.

Another key governance issue identified in the literature was weak regulatory enforcement. Although many ASEAN countries have introduced environmental regulations, sustainability guidelines, and green development policies, enforcement remains uneven and, in some cases, ineffective. Limited administrative capacity, inadequate monitoring systems, and insufficient financial and human resources constrain the ability of authorities to ensure compliance. As a result, environmental standards are frequently compromised in favor of short-term economic gains, particularly in sectors such as manufacturing, construction, and natural resource extraction.

The findings also highlighted the role of political commitment and institutional capacity in shaping sustainability outcomes. Changes in political leadership, shifting national priorities, and short-term policy horizons often disrupt the continuity of green development initiatives. In several ASEAN countries, sustainability policies were found to depend heavily on political will rather than being embedded within strong institutional frameworks. This dependency increases vulnerability to policy reversals and weakens long-term planning for sustainable economic transformation.

At the regional level, governance challenges are further compounded by the ASEAN principle of non-interference and consensus-based decision-making. While regional frameworks and action plans reflect collective commitments to sustainability, their implementation relies primarily on voluntary national actions. The literature suggested that this governance structure

limits the enforceability of regional sustainability goals and results in uneven implementation across member states. Strengthening institutional coordination, enhancing governance capacity, and improving accountability mechanisms were therefore identified as essential steps for advancing sustainable economy and green development in ASEAN.

### **Social Dimensions of Green Development**

The literature emphasized that the social dimensions of green development are central to the success of a sustainable economy in ASEAN (Sadiq et al., 2023). Green development initiatives do not operate in isolation from society; instead, they directly influence employment structures, income distribution, and community livelihoods. Many studies highlighted that the transition toward environmentally sustainable economic activities can create both opportunities and risks for different social groups. While green sectors have the potential to generate new jobs and improve living standards, the benefits are not automatically inclusive and may bypass vulnerable populations if social considerations are not adequately integrated into policy design.

A major social challenge identified in the literature is the potential displacement of workers in carbon-intensive industries such as fossil fuel energy, manufacturing, mining, and traditional agriculture. In several ASEAN countries, these sectors employ a significant proportion of the labor force, often including low-skilled and informal workers. The shift toward greener production systems may reduce employment opportunities in these industries, creating risks of unemployment and income insecurity. Without comprehensive reskilling, upskilling, and workforce transition programs, green development may exacerbate social inequalities and resistance to sustainability reforms.

The literature also underscored issues of social inequality and access to green development benefits. Low-income households and marginalized communities often face limited access to clean energy, sustainable transportation, and environmentally healthy living conditions. In urban areas, green infrastructure projects may inadvertently contribute to rising living costs and displacement, while rural communities may struggle to participate in green economic opportunities due to limited education, infrastructure, and financial resources. These disparities highlight the importance of inclusive green development strategies that prioritize equity and social justice.

Community participation and public awareness were identified as essential social factors influencing green development outcomes. The literature indicated that sustainability initiatives are more effective when local communities are actively engaged in decision-making processes and when public understanding of environmental issues is strong. In ASEAN, limited environmental awareness and insufficient stakeholder engagement can reduce public support for green policies. Strengthening education, social dialogue, and participatory governance mechanisms was therefore recognized as crucial for ensuring that green development contributes to broader social well-being and long-term sustainable economic transformation.

### **Regional Cooperation and ASEAN Initiatives**

The literature highlighted regional cooperation as a key mechanism for advancing sustainable economy and green development in ASEAN, given the transboundary nature of environmental challenges and the economic interconnectedness of member states (Trang, 2025). Issues such as climate change, air pollution, marine degradation, and biodiversity loss extend beyond national borders, requiring collective regional responses. ASEAN has increasingly recognized this reality by incorporating sustainability objectives into its regional development agenda and promoting cooperation among member states through shared frameworks and policy dialogues.

Several ASEAN initiatives were identified as important platforms for promoting sustainable development, including the ASEAN Community Vision 2025, the ASEAN Socio-Cultural Community Blueprint, and regional climate and environmental action plans. These initiatives reflect a collective commitment to environmental sustainability, climate resilience, and inclusive growth. The literature noted that such frameworks have helped harmonize sustainability goals, encourage knowledge sharing, and foster policy convergence among member states. Regional forums and working groups also provide opportunities for capacity building, technical cooperation, and the exchange of best practices in green development.

Despite these efforts, the literature consistently pointed to limitations in the effectiveness of regional cooperation. The ASEAN principle of non-interference and consensus-based decision-making constrains the enforcement of regional sustainability commitments. Implementation of green development initiatives remains largely dependent on national priorities, institutional capacity, and political will. As a result, progress toward sustainability goals varies significantly across member states, reducing the overall impact of regional frameworks and creating gaps between collective aspirations and practical outcomes.

The findings further suggested that strengthening regional cooperation requires more than policy alignment. Enhanced regional financing mechanisms, joint research and innovation initiatives, and coordinated capacity-building programs were identified as critical for supporting less developed member states. The literature emphasized that deeper cooperation in green finance, technology transfer, and data sharing could help reduce disparities and accelerate the region's transition toward a sustainable economy. Without such strengthened collaborative mechanisms, ASEAN initiatives may continue to function primarily as guiding frameworks rather than drivers of transformative green development.

### **Technological and Innovation Challenges**

The literature identified technological and innovation challenges as significant barriers to advancing a sustainable economy and green development in ASEAN (Nepal et al., 2021; Rehman & Holý, 2022). One of the most prominent issues is the limited availability and uneven distribution of green technologies across member states. While more advanced ASEAN economies have made progress in adopting renewable energy systems, energy-efficient technologies, and digital solutions for environmental management, less developed countries continue to face constraints related to high technology costs and limited access to modern infrastructure. This technological gap contributes to uneven progress toward sustainability goals within the region.

Another key challenge highlighted in the literature is the low level of investment in research and development (R&D) related to green innovation. Many ASEAN countries allocate relatively small portions of their national budgets to R&D, particularly in areas such as clean energy, sustainable agriculture, and environmental technologies. As a result, domestic innovation capacity remains limited, increasing dependence on imported technologies. This reliance not only raises costs but also restricts the ability of local industries to adapt green solutions to country-specific environmental and economic conditions.

The findings also emphasized weaknesses in innovation ecosystems and knowledge transfer mechanisms. Limited collaboration between governments, academic institutions, and the private sector reduces the effectiveness of innovation-driven sustainability efforts. In several ASEAN countries, regulatory uncertainty, insufficient intellectual property protection, and a lack of incentives for green entrepreneurship further discourage private sector involvement in technological innovation. These institutional barriers slow the diffusion of sustainable technologies and hinder the development of competitive green industries.

The literature underscored the importance of regional cooperation in addressing technological and innovation challenges. Cross-border collaboration in technology transfer, joint research initiatives, and regional innovation platforms was identified as a potential strategy to reduce disparities among ASEAN member states. However, such cooperation remains limited in practice due to differences in technological readiness, funding capacity, and national priorities. Strengthening regional innovation networks and enhancing support for green technology development were therefore recognized as essential for accelerating sustainable economic transformation in ASEAN.

### **Synthesis of Cross-Cutting Themes**

The synthesis of the reviewed literature revealed several cross-cutting themes that consistently shaped sustainable economy and green development outcomes in ASEAN (Correia et al., 2025). One prominent theme was the persistent tension between economic growth objectives and environmental sustainability. Many ASEAN countries continue to prioritize rapid economic expansion, industrialization, and export competitiveness, often at the expense of environmental protection. This growth-oriented development model has made it difficult to fully integrate sustainability principles into economic planning, resulting in policy trade-offs that favor short-term economic gains over long-term environmental resilience.

Another recurring theme was the gap between policy commitment and implementation. Across the literature, ASEAN governments were found to have articulated strong sustainability goals through national strategies and regional frameworks. However, practical implementation often lagged due to limited institutional capacity, insufficient funding, and weak monitoring mechanisms. This implementation gap reduced the effectiveness of green development policies and contributed to uneven progress across countries and sectors. The findings suggested that policy success depends not only on strategic planning but also on administrative capability and consistent enforcement.

Social inclusion emerged as a critical cross-cutting concern across all dimensions of sustainable development. The literature emphasized that green development policies frequently overlook social equity considerations, leading to unequal distribution of costs and benefits. Vulnerable groups, including low-income households, informal workers, and rural communities, are often more exposed to environmental risks while having limited access to green economic opportunities. Without inclusive policy design, sustainability transitions risk reinforcing existing social and economic inequalities within ASEAN societies.

The literature highlighted the importance of coordination and integration across policy domains and governance levels. Sustainable economy and green development challenges were found to be interconnected, requiring holistic approaches that bridge environmental, economic, social, and technological policies. Weak coordination among government agencies, limited stakeholder engagement, and insufficient regional collaboration hinder the development of integrated solutions. The findings underscored that addressing sustainability challenges in ASEAN requires coherent, multi-level governance structures that align national priorities with regional and global sustainability agendas.

### **Conclusion**

This literature review demonstrated that achieving a sustainable economy and advancing green development in ASEAN remain complex and multifaceted challenges shaped by environmental pressures, economic and financial constraints, institutional and governance limitations, social considerations, and uneven regional cooperation. While ASEAN has shown growing commitment through policy frameworks and regional initiatives, the effectiveness of these efforts continues to be constrained by disparities in development capacity, limited financial

resources, weak institutional coordination, and social risks associated with economic transition. The findings underscore the need for more integrated, inclusive, and cooperative approaches that align economic growth with environmental sustainability and social equity, highlighting that long-term sustainable development in ASEAN will depend not only on policy commitments but also on effective implementation, regional solidarity, and sustained institutional strengthening.

## References

- Ali, M. A., Kamraju, M., & Sonaji, D. B. (2024). Economic policies for sustainable development: Balancing growth, social equity, and environmental protection. *ASEAN Journal of Economic and Economic Education*, 3(1), 23-28.
- Al-Masri, R., & Ibrahim, M. (2025). Integrating green finance, economic complexity, and renewable energy for sustainable development in Asia. *Journal of Energy and Environmental Policy Options*, 8(1), 66-74. <https://doi.org/10.5281/zenodo.17377133>
- Chien, F., Paramaiah, C., Pham, H. C., Phan, T. T. H., & Ngo, T. Q. (2023). The impact of eco-innovation, trade openness, financial development, green energy and government governance on sustainable development in ASEAN countries. *Renewable Energy*, 211, 259-268. <https://doi.org/10.1016/j.renene.2023.04.109>
- Correia, J., Leong, S., & Sinay, J. (2025). Transforming ASEAN for Sustainability: The Role of Regional Integration in Advancing ASEAN's Green Transition. <https://doi.org/10.56506/MSKG5757>
- Herrador, M., & Van, M. L. (2024). Circular economy strategies in the ASEAN region: A comparative study. *Science of The Total Environment*, 908, 168280. <https://doi.org/10.1016/j.scitotenv.2023.168280>
- Jermisittiparsert, K. (2021). Does urbanization, industrialization, and income unequal distribution lead to environmental degradation? Fresh evidence from ASEAN. *International Journal of Economics and Finance Studies*, 13(2), 253-272.
- Khan, S. A. R., Godil, D. I., Yu, Z., Abbas, F., & Shamim, M. A. (2022). Adoption of renewable energy sources, low-carbon initiatives, and advanced logistical infrastructure—an step toward integrated global progress. *Sustainable Development*, 30(1), 275-288. <https://doi.org/10.1002/sd.2243>
- Nepal, R., Phoumin, H., & Khatri, A. (2021). Green technological development and deployment in the association of southeast Asian economies (ASEAN)—at crossroads or roundabout?. *Sustainability*, 13(2), 758. <https://doi.org/10.3390/su13020758>
- Qudrat-Ullah, H. (2024). *Transitioning Fossil-based Economies: Sustainable Strategies for Energy Change*. Taylor & Francis. New York: Routledge
- Rehman, S., & Holý, O. (2022). Is green and sustainable technological innovation a potential driver of environmental performance? An empirical investigation across the ASEAN region. *Frontiers in Environmental Science*, 10, 958203. <https://doi.org/10.3389/fenvs.2022.958203>
- Roy, P., Pal, S. C., Chakraborty, R., Chowdhuri, I., Saha, A., & Shit, M. (2023). Effects of climate change and sea-level rise on coastal habitat: Vulnerability assessment, adaptation strategies and policy recommendations. *Journal of Environmental Management*, 330, 117187. <https://doi.org/10.1016/j.jenvman.2022.117187>

- Sadiq, M., Ngo, T. Q., Pantamee, A. A., Khudoykulov, K., Ngan, T. T., & Tan, L. P. (2023). The role of environmental social and governance in achieving sustainable development goals: evidence from ASEAN countries. *Economic research-Ekonomska istraživanja*, 36(1), 170-190. <https://doi.org/10.1080/1331677X.2022.2072357>
- Tanjung, M., & Shimada, Y. (2025). Modelling the Impact of Governance and Economic Growth: Insights From ASEAN and Developed Countries. *Journal of Public Affairs*, 25(2), e70048. <https://doi.org/10.1002/pa.70048>
- Trang, N. T. T. (2025). Strengthening ASEAN's Climate Governance: Challenges, Opportunities, and Pathway for Regional Cooperation. *Journal of International Development Studies*, 33(3), 15-30. [https://doi.org/10.32204/jids.33.3\\_15](https://doi.org/10.32204/jids.33.3_15)
- Zhou, K., Chen, H., Ismail, M., & Yang, T. (2025). Assessment of Sustainable Development Levels, Country Disparities, and Dynamic Evolution Trends of ASEAN-10 Countries. *Sustainable Development*. <https://doi.org/10.1002/sd.70107>