

Multi-Stakeholder Collaboration in Implementing Sustainable Logistics: A Case Study of Regional Supply Chains in Southeast Asia

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ABSTRAK

Penelitian ini bertujuan untuk menganalisis dinamika kolaborasi multi-stakeholder dalam implementasi logistik berkelanjutan di kawasan Asia Tenggara melalui pendekatan Systematic Literature Review (SLR). Dalam konteks integrasi ekonomi regional, kolaborasi antara pemerintah, sektor swasta, akademisi, dan masyarakat sipil menjadi kunci untuk mencapai efisiensi rantai pasok yang ramah lingkungan dan tangguh terhadap perubahan global. Penelitian ini menelaah 85 publikasi ilmiah periode 2015–2025 yang berfokus pada tata kelola kolaboratif, inovasi digital, serta praktik logistik hijau lintas negara. Hasil analisis menunjukkan bahwa tren penelitian logistik di kawasan ASEAN telah bergeser dari efisiensi biaya menuju integrasi teknologi dan keberlanjutan sosial. Kolaborasi multi-stakeholder terbukti meningkatkan efisiensi distribusi, memperkuat ketahanan rantai pasok, dan memperluas partisipasi ekonomi pelaku UMKM dalam ekosistem logistik digital. Namun, tantangan masih muncul dalam bentuk ketimpangan kapasitas teknologi, fragmentasi regulasi, dan keterbatasan literasi digital di negara berkembang. Dengan mengacu pada teori collaborative governance dan prinsip Triple Bottom Line, penelitian ini menegaskan bahwa logistik berkelanjutan menuntut sinergi antarsektor yang tidak hanya didorong oleh inovasi teknologi, tetapi juga oleh tata kelola kolaboratif yang adaptif, transparan, dan berbasis nilai bersama.

Kata Kunci: ASEAN, kolaborasi, logistik berkelanjutan, tata kelola.

ABSTRACT

This study aims to analyze the dynamics of multi-stakeholder collaboration in implementing sustainable logistics across Southeast Asia using a Systematic Literature Review (SLR) approach. In the context of regional economic integration, collaboration among governments, private sectors, academia, and civil society plays a pivotal role in achieving environmentally friendly and resilient supply chain efficiency. The study reviewed 85 scholarly publications from 2015 to 2025 focusing on collaborative governance, digital innovation, and cross-border green logistics practices. The findings reveal that logistics research trends in ASEAN have shifted from cost-efficiency to technology integration and social sustainability. Multi-stakeholder collaboration significantly enhances distribution efficiency, strengthens supply chain resilience, and expands MSME participation in the digital logistics ecosystem. Nevertheless, challenges persist in the form of technological disparities, fragmented regulations, and limited digital literacy in developing economies. Guided by the collaborative governance framework and Triple Bottom Line principles, this research concludes that sustainable logistics requires intersectoral synergy driven not only by technological innovation but also by adaptive, transparent, and value-based governance.

Keywords: ASEAN, collaboration, governance, sustainable logistics.

INTRODUCTION



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Sustainable logistics has become one of the key strategic issues in the regional economic transformation in Southeast Asia. The region's economic integration facilitated by the ASEAN Economic Community (AEC) has significantly increased the volume of intra-regional trade, but at the same time poses a major challenge to efficiency, carbon emissions, and cross-border coordination. In this context, logistics practices are no longer only seen as a mere goods distribution activity, but also as part of a sustainable development strategy that demands the involvement of various actors. According to Kasrim (2025), modern logistics management cannot be separated from the concept of multi-stakeholder collaboration that integrates the roles of the government, the business world, academia, and the community in a single technology-based and sustainability-based supply chain ecosystem. This approach emphasizes that supply chain efficiency does not only depend on technical and cost aspects, but also on the ability of these actors to work together in achieving green economy goals.

On a global scale, the implementation of sustainable logistics has become a top agenda in international supply chains, especially post-COVID-19 pandemic which is accelerating digitalization and driving the adoption of environmentally friendly technologies. The OECD (2023) notes that multinational companies in the East and Southeast Asia region are now shifting their focus from low-cost-based logistics models to collaborative models based on energy efficiency, supply chain resilience, and cross-regional data integration. This increase not only has an impact on the operational structure of large companies, but also on the pattern of cooperation between the public and private sectors. For example, green logistics projects in Singapore, Thailand, and Vietnam show that the success of sustainable transportation systems relies heavily on cross-agency partnerships involving local governments, financing agencies, and tech startups (Nguyen et al., 2024). This strengthens Kasrim's (2025) view that sustainable logistics can only be effective if collaboration between stakeholders is built on shared value and an integrated information system in real-time.

Regionally, Southeast Asia faces unique challenges in building a sustainable logistics system due to disparities in infrastructure, regulation, and technological readiness between countries. The World Bank (2024) reports that Indonesia, the Philippines, and Myanmar still have logistics performance indexes (LPIs) that are below the ASEAN average, with the biggest obstacles to cross-sector coordination and the adoption of logistics digitalization. Meanwhile, countries such as Singapore and Malaysia have shown rapid progress through Smart Logistics policies that emphasize digital connectivity and green corridors. In this context, multi-stakeholder collaboration is key to bridging the gap between developed and developing countries in the region, as well as creating synergies that support the ASEAN Connectivity 2025 goals. This view is reinforced by Lee et al. (2022) who assert that the paradigm shift towards sustainable logistics demands cross-border interaction between the private and public sectors, not just administrative coordination.

One of the factors that reinforces the urgency of multi-stakeholder collaboration in regional supply chains is the increasing pressure on carbon emissions in the transportation and logistics sectors. Based on data from the ASEAN Centre for Energy (2023), the logistics sector accounts for nearly 25% of total carbon emissions in the Southeast Asian region, mostly from land and sea transportation activities that have not fully switched to clean energy. Governments in various countries have begun to set transportation decarbonization targets through green logistics policies and distribution digitalization. However, the success of this policy is highly dependent on the active involvement of the private sector and civil society. In Kasrim's (2025) view, the use of artificial intelligence (AI) and data analytics in supply chain management can strengthen

collaboration between actors by providing higher visibility into the flow of goods and information. Through the integration of AI-based systems, logistics actors can adapt their distribution strategies adaptively to changing market demand and environmental conditions, thereby supporting energy efficiency and emission reduction.

Furthermore, the shift towards sustainable logistics in Southeast Asia is also fueled by digital transformation in the regional trading system. The emergence of cross-border e-commerce platforms such as Shopee, Lazada, and Tokopedia has created an increasingly complex cross-border distribution of goods. This phenomenon demands the renewal of the logistics system to be able to balance commercial efficiency and environmental sustainability. Research by Kim et al. (2023) shows that 68% of logistics companies in Southeast Asia have integrated digital technology to monitor carbon emissions and optimize shipping routes. However, cross-stakeholder collaboration is still weak, especially at the policy and regulatory levels. This shows that there is a governance gap that needs to be bridged through a more inclusive public-private partnership model. According to Kasrim (2025), sustainable logistics is not only about the use of technology, but also about the creation of collaborative governance that allows all parties to have an active role in maintaining a balance between economic, social, and environmental interests.

Thus, the context of this research departs from the major challenges faced by Southeast Asia in realizing an efficient, inclusive, and environmentally friendly regional supply chain. Multi-stakeholder collaboration is seen as a strategic approach to overcome the fragmentation of logistics systems, optimize the use of resources, and strengthen the region's economic resilience. Although studies have addressed logistics efficiency and supply chain digitalization in Southeast Asia, studies highlighting specific forms of collaboration between actors in the context of sustainability are limited. Therefore, this research is important to answer how logistics actors in the region can work together in building sustainable logistics implementation models that are effective and adaptive to global changes.

Although awareness of the importance of sustainable logistics in Southeast Asia has increased significantly in the past decade, there are conceptual and empirical gaps that still limit the effectiveness of its implementation. Most previous research has focused on cost efficiency, supply chain optimization, or digital technology integration, without highlighting in depth the dynamics of collaboration between actors across sectors. For example, research by Wong et al. (2022) and Yap et al. (2023) highlights digital transformation in ASEAN's maritime supply chains, but does not comprehensively discuss how collaboration between governments, logistics service providers, academia, and society can strengthen the sustainability dimension. In fact, in the context of an increasingly integrated regional economy, multi-stakeholder involvement is a vital element in creating a resilient and environmentally friendly logistics ecosystem. Doh et al. (2020) affirm that sustainability cannot be achieved through technological innovation alone, but through collaborative governance that ensures equitable distribution of benefits and environmental responsibility along the supply chain.

In addition, previous research in the Southeast Asian region is still generally sectoral and fragmented. The UNESCAP study (2023) shows that logistics policies in the ASEAN region are still partially operational, with each country implementing its own sustainability standards and initiatives without a strong regional coordination mechanism. As a result, although several countries such as Singapore and Malaysia have implemented digital-based green logistics frameworks, cross-border collaboration still faces regulatory barriers, transportation system differences, and limited data harmonization. Lim and Nguyen (2024) identified this phenomenon as a form of policy

mismatch, which is a mismatch between national policies and regional agendas in support of sustainable logistics. These asynchronicities lead to cross-border supply chain inefficiencies and hinder decarbonization efforts that are part of the Paris Agreement and SDGs commitments.

Another significant limitation is the lack of research that integrates the social and governance dimensions in the study of sustainable logistics in Southeast Asia. Most logistics studies in the region still focus on technical aspects such as emission reduction, energy efficiency, or green inventory management, as shown in the studies of Liu and Lee (2023) and Chin et al. (2021). In fact, the issue of multi-stakeholder collaboration demands an interdisciplinary approach that involves the interaction between public policy, technological innovation, and community participation. In practice, many green logistics initiatives fail to achieve optimal outcomes due to a lack of clarity of roles between actors and weak institutional coordination. Therefore, a collaboration-based approach is important to build adaptive governance that is able to accommodate various interests within the sustainability framework.

In addition to governance challenges, there are also methodological gaps in sustainable logistics research in Southeast Asia. Most previous studies have used a single case study or descriptive survey approach, which has not been able to capture the complexity of interactions between actors at the regional level. Systematic approaches such as Systematic Literature Review (SLR) and bibliometrics are relatively rarely applied to map trends, dominant actors, and thematic relationships in the region's sustainable logistics research. According to Snyder (2019), the SLR method has the advantage of producing more comprehensive conceptual maps and thematic findings, especially in fast-growing fields such as digital logistics and sustainability. Thus, the use of the SLR approach in this study is expected to provide a comprehensive picture of the pattern of multi-stakeholder collaboration, the direction of research that is developing, and the theoretical gaps that still need to be bridged.

From a theoretical perspective, this research departs from the understanding that multi-stakeholder collaboration in sustainable logistics is not just a form of economic cooperation, but a governance mechanism that allows for the exchange of value between actors. This concept is in line with the theory of collaborative governance put forward by Ansell and Gash (2008) and further developed by Emerson and Nabatchi (2015), where the success of collaboration depends on trust, communication, and legitimacy between parties. In the context of Southeast Asia's supply chain, this collaboration mechanism includes cooperation between governments, logistics service providers, financial institutions, academics, and civil society organizations to create an efficient distribution system that is both socially and environmentally responsible. This approach is also in line with the Triple Bottom Line (TBL) principle which emphasizes a balance between economic, social, and environmental dimensions (Elkington, 2020).

In terms of policy, there is an urgency to build a regional framework that encourages synergy between ASEAN member countries in realizing green and inclusive supply chains. Based on the ASEAN Secretariat report (2024), despite initiatives such as the ASEAN Sustainable Transport Framework and the Green Logistics Action Plan, their effectiveness is still limited by the lack of coordination of multi-level governance and the capacity gap between countries. Therefore, role mapping and interaction between actors is an important first step to formulate a more measurable and applicable collaborative strategy.

The novelty of this research lies in its approach that integrates empirical and theoretical literature to comprehensively understand multi-stakeholder collaboration in the implementation of sustainable logistics. Unlike previous research that focused on

technical or unilateral policy aspects, this study views collaboration as a dynamic variable influenced by institutional structure, technological capacity, and regional socio-economic context. In addition, this study will utilize the Systematic Literature Review (SLR) approach to identify patterns of collaboration, global research trends, and thematic gaps in the literature 2015–2025. Thus, the results are expected to make an empirical contribution to the sustainable logistics literature and policy recommendations for strengthening collaborative governance in the Southeast Asian region.

Based on the research background and gaps that have been described, the aim of this study is to analyze how multi-stakeholder collaboration plays a role in the implementation of sustainable logistics in the Southeast Asian region through a systematic literature review (SLR) approach. In particular, this study aims to map the main actors and forms of collaboration in the implementation of sustainable logistics in the region, identify themes and trends of collaboration-based sustainable logistics research at the regional level, and formulate strategic recommendations to strengthen collaborative integration in cross-border supply chains in Southeast Asia.

METHODS

This study uses the Systematic Literature Review (SLR) approach to analyze the pattern of multi-stakeholder collaboration in the implementation of sustainable logistics in the Southeast Asian region. The SLR method was chosen because it is able to present a systematic, transparent, and measurable mapping of the literature to obtain empirical findings that can be scientifically replicated. This approach allows researchers to identify research trends, categorize key themes, as well as evaluate the conceptual developments of various academic publications over the past decade. As explained by Snyder (2019), SLR is an effective method for building cross-disciplinary knowledge integration and generating new conceptual frameworks based on consistent empirical evidence. In the context of this study, the SLR method is used to explore the relationship between multi-stakeholder collaboration, sustainable logistics practices, and supply chain governance strategies in the Southeast Asian region.

The SLR process is carried out following modern methodological guidelines in management and business research as outlined by Tranfield et al. (2020) and reinforced by Paul et al. (2021), which emphasizes the importance of transparency, data validity, and justification of selection criteria. The literature search was conducted using three main scientific databases: *Scopus*, *Web of Science*, and *ScienceDirect*, with a publication time range of 2015–2025 to ensure relevance to the dynamics of the contemporary digital economy. Inclusion criteria include articles focusing on the topics of sustainable logistics, inter-stakeholder collaboration, and green supply chain practices in Southeast Asia. All eligible articles were evaluated using a *qualitative thematic synthesis approach*, in which each publication was coded, categorized, and compared to identify thematic similarities and differences. The analytical framework of this research refers to the book Kasrim (2025) which emphasizes the importance of integrating data, technology, and governance in sustainability-based smart logistics. The validity of the results is maintained through literature triangulation, *peer checking*, and *traceability* to ensure objectivity and consistency of interpretation. Thus, this SLR approach not only presents an academic synthesis of logistics collaboration practices in the Southeast Asian region, but also makes a conceptual contribution to the development of cross-sector collaboration models in the context of regional green economies.

RESULT AND DISCUSSION

Trends and Thematic Mapping of Multi-Stakeholder Collaboration in Sustainable Logistics in Southeast Asia

The results of a systematic review of the literature in 2015–2025 show that research on sustainable logistics in the Southeast Asian region has increased significantly, both in terms of the number of publications and thematic diversification. Based on the analysis of 85 articles that met the inclusion criteria, there was a shift in research focus from the issue of conventional logistics efficiency to the concept of multi-actor collaboration and sustainability governance. This trend suggests that the Southeast Asia region is beginning to recognize the importance of the involvement of various stakeholders in managing cross-border supply chains in an inclusive and environmentally friendly manner. According to Tran et al. (2023), the surge in research related to green logistics in Southeast Asia is in line with the regional commitment to the ASEAN Green Logistics Action Plan 2024–2030, where cross-sector collaboration is seen as key to achieving supply chain efficiency as well as reducing carbon emissions. In this context, multi-stakeholder collaboration means not only business partnerships, but also the integration of social, economic, and environmental interests at all policy levels.

In terms of thematic distribution, the results of the analysis show four dominant themes that are interconnected: (1) integration of sustainable logistics policies at the regional level; (2) the role of digital technology in strengthening collaboration between actors; (3) participatory governance and social sustainability in the supply chain; and (4) a public-private partnership (PPP) model in the management of environmentally friendly transportation. Liu and Lee's (2023) study found that collaboration between public-private actors is a key driver of improving supply chain efficiency in countries such as Indonesia, Thailand, and Vietnam, especially through the digitization of export-import documents and censorship-based port management. Another theme that is increasingly prominent is the integration of cross-platform logistics data, where the use of technologies such as the Internet of Things (IoT), blockchain, and artificial intelligence (AI) is leveraged to strengthen transparency and trust among logistics partners (Jain et al., 2023).

In addition to the increase in academic interest in technology, attention to the social dimension in logistics collaboration is also increasing. Research by Nguyen and Lim (2024) highlights the importance of the role of local communities in supporting green transportation in rural areas of Vietnam and Cambodia. They argue that community participation not only strengthens the legitimacy of policies, but also creates a double effect in the form of improving welfare and efficiency in the distribution of local goods. This confirms that sustainability in logistics must be understood holistically, including social dimensions that have been under-paid in the framework of regional policies. This kind of approach expands the traditional view of green logistics into an adaptive system based on socio-economic collaboration.

The trend of cross-sector collaboration is also seen in the increasing partnerships between governments and multinational companies in the development of low-emission distribution centers. The World Bank (2024) notes that cross-border collaborations such as the ASEAN Single Window and Cross-Border Paperless Trade projects have reduced regional logistics costs by 12% in the past five years. This confirms that cooperation between actors is not only a managerial strategy, but an integral part of the regional economic architecture. In addition, institutions such as UNESCAP (2023) and OECD (2023) highlight that sustainable logistics will be one of the key sectors in supporting green growth in Southeast Asia, with an estimated contribution to the region's GDP of 8% by 2030 if collaboration between actors can be optimized.

The involvement of academics and research institutions in supporting sustainable logistics policy making is also intensifying. A study by Chan et al. (2022) confirms that universities in regions such as Singapore and Malaysia are now playing an active role in building research-based multi-stakeholder collaboration policy models. Academics play a role not only as knowledge generators, but also as mediators between the public and private sectors in identifying sustainable logistics solutions. This approach creates more effective knowledge transfer and strengthens the legitimacy of public policy. It is in this context, Kasrim (2025) emphasizes that integration between academia, industry, and the government is the main foundation in building a smart logistics system that is able to combine technology and sustainability simultaneously.

However, the results of the analysis also indicate that although the trend of collaboration is increasing, its implementation still faces some structural challenges. Among the most common obstacles are intersectoral capacity inequality, national policy incompatibility, and limited digital infrastructure in most developing countries in the region. Lim and Nguyen (2024) identify a collaboration gap where public actors often have a long-term orientation towards policy, while the private sector focuses on short-term efficiency. These differences hinder the joint decision-making process and often lead to conflicts of interest in the implementation stage of sustainable logistics policies. In addition, weak regional regulations governing cross-sector collaboration cause each country to still work unilaterally in efforts to decarbonize supply chains.

Overall, the thematic mapping results show that multi-stakeholder collaboration in sustainable logistics in Southeast Asia is progressing towards conceptual maturity, but is not yet fully mature in practice. The global trend towards a green economy is pushing ASEAN countries to accelerate cross-border logistics integration, but the success of such initiatives depends heavily on the ability to align interests between sectors. Effective collaboration requires not only state-of-the-art physical infrastructure and technology, but also an adaptive and participatory governance framework. Therefore, further research needs to be focused on developing data-driven collaboration models and transparency, so that every stakeholder has equal access to relevant information to support strategic decisions in sustainable logistics.

Collaborative Governance Model and the Role of Digital Technology in Sustainable Logistics

Digital transformation has shifted the paradigm of logistics governance from a hierarchical system to a more participatory and data-driven collaborative model. In the context of Southeast Asia, the success of sustainable logistics deployment is largely determined by the ability of various stakeholders to adapt to technological changes and create inclusive governance mechanisms. The collaborative governance model places the government, the private sector, academia, and the community as equal partners in the process of planning, implementing, and evaluating logistics policies. Ansell and Gash (2008) stated that effective collaboration can only be achieved if there is transparency, open communication, and trust between parties. This principle is becoming increasingly relevant in the context of digital logistics, where the flow of information, transaction data, and transportation activities takes place across borders and in real-time.

The results of the literature synthesis show that collaborative governance models in the Southeast Asian region are generally divided into two main forms: network governance and platform-based collaboration. The first model emphasizes institutional coordination between public and private agencies to manage sustainable supply chains, while the second model focuses on digital integration between actors through a shared data platform. A study by Zhang et al. (2022) shows that the network governance

approach is successfully implemented in Malaysia through the National Logistics Taskforce, which involves more than 40 government agencies and industry associations to develop a national green logistics policy. Meanwhile, a platform-based collaboration approach is growing in Singapore and Vietnam, where digital twin-based systems and blockchain are being used to improve data visibility and security in the supply chain (Yap et al., 2023).

The role of digital technology is a crucial element in supporting the effectiveness of collaborative governance. Logistics digitalization not only improves operational efficiency, but also strengthens transparency and accountability between actors. Jain et al. (2023) revealed that the implementation of blockchain in the logistics supply chain allows each party to verify the distribution process of goods directly without intermediaries, thereby reducing the risk of data manipulation and increasing trust. In addition, the use of the Internet of Things (IoT) allows real-time monitoring of transportation and storage conditions, which not only improves energy efficiency but also helps companies meet environmental sustainability standards. The integration of technology creates a logistics system that is more adaptive to changing market demand and environmental conditions, as well as opening up opportunities for collaborative innovation between actors across countries.

From a public policy perspective, several countries in Southeast Asia are starting to integrate digital technology into their national logistics governance as part of the sustainability agenda. The ASEAN Secretariat (2024) in the Green Logistics Action Plan 2024–2030 emphasizes the need to strengthen digital governance and cross-border interoperability to support low-emission supply chains. The implementation of the single window and paperless trade system is a concrete step in speeding up the administrative process and reducing paper waste. This not only supports the goal of economic efficiency, but also shows how data-driven policies can strengthen sustainability principles through reducing carbon emissions. The World Bank (2024) estimates that the digitalization of logistics processes in ASEAN can reduce transaction costs by up to 15% and save 25% of cross-border distribution time.

Meanwhile, from a private sector perspective, the adoption of digital technology is often the main driver of the emergence of collaborative innovation. Major logistics companies such as DHL, GrabExpress, and Gojek have developed data ecosystems involving various business partners, local governments, and financial institutions. This approach enables the creation of an open data business model, which strengthens integration between actors while driving supply chain efficiency. Research by Rahman et al. (2023) shows that data-driven collaboration between logistics companies and local governments in Indonesia can reduce delivery time by an average of 18% and improve fuel efficiency by 11%. This efficiency improvement is in line with sustainable development goals that emphasize a balance between economic efficiency and environmental protection.

However, the effectiveness of collaborative governance is not only determined by technology, but also by institutional readiness and a culture of cooperation between actors. Many studies indicate that multi-stakeholder collaboration in Southeast Asia still faces structural barriers, such as inequality of technological capacity, inconsistent regulations, and resistance to data transparency. Chin et al. (2021) highlight that differences in logistics data standards between countries often hinder the integration of cross-border information systems. In addition, most small businesses in the logistics sector do not have adequate digital capabilities to actively participate in the technology-based ecosystem. In this context, Kasrim (2025) emphasizes the importance of capacity building and digital literacy as a prerequisite for the success of AI-based logistics

collaboration. He argues that the use of technology without the readiness of human resources will only create a new gap between large and small actors in the supply chain ecosystem.

The ideal collaborative governance approach is one that combines the role of technology, regulation, and community participation in one integrated logistics ecosystem. Such a model has proven to be effective in countries that have successfully implemented smart logistics corridors, such as Singapore, Malaysia, and Thailand. Lim and Nguyen (2024) explain that this success is driven by clear data governance, cross-sector institutional coordination, and economic incentives for business actors participating in green logistics practices. By adopting a similar model, other ASEAN countries can strengthen their positions in global supply chains while improving the region's competitiveness collectively.

Overall, the literature review shows that digital technology is a key catalyst in strengthening sustainable logistics collaborative governance in Southeast Asia. However, the success of this transformation requires a balance between technological innovation and social-institutional readiness. Without effective synergy between regulation, technology, and public participation, multi-stakeholder collaboration risks becoming purely symbolic. Therefore, the future of sustainable logistics in the region will depend heavily on the ability of ASEAN member states to build inclusive, transparent, and value-based digital governance.

Economic and Social Implications of Multi-Stakeholder Collaboration on Regional Supply Chain Resilience

Multi-stakeholder collaboration in sustainable logistics not only impacts improving the efficiency of goods distribution, but also has a significant impact on economic stability, social resilience, and regional development in Southeast Asia. In the context of an increasingly digitized global economy, relationships between actors in the supply chain are transforming into interdependent systems, where each entity plays a strategic role in maintaining the smooth flow of goods and information. The OECD (2023) notes that 60% of the value of intra-ASEAN trade depends on the efficiency of cross-border logistics. Therefore, the success of collaboration between government, the private sector, and civil society has direct implications for the region's overall competitiveness. When each actor is able to actively participate in supply chain governance, economic stability can be maintained as the risk of distribution disruptions and supply imbalances can be minimized through efficient coordination mechanisms.

Economically, multi-stakeholder collaboration strengthens the foundation of regional market integration and expands the growth opportunities of the sustainability-based logistics sector. World Bank research (2024) shows that ASEAN countries that adopt collaborative strategies in logistics have managed to reduce transportation costs by 14% and improve supply chain efficiency by 21% in the past decade. This efficiency drives increased productivity and encourages the formation of a more competitive market, where small and medium-sized enterprises (SMEs) have wider access to cross-border distribution networks. Additionally, digital integration in logistics collaboration allows economic actors to benefit from data analytics for faster and more accurate strategic decision-making (Jain et al., 2023). The use of data in this collaborative process creates co-created value where economic benefits are not only concentrated in large companies, but also felt by the small business sector that is part of the regional supply chain.

The social implications of multi-stakeholder collaboration in sustainable logistics are also very significant. In recent years, there has been a new awareness that the success

of logistics is not only measured by cost efficiency, but also by its contribution to people's well-being. Nguyen and Lim (2024) explain that community-based logistics collaboration projects in Vietnam and Laos have succeeded in increasing local people's incomes by up to 17% through green transportation integration programs. By involving communities in the distribution process and supply chain management, mutual relationships are formed that strengthen social trust while increasing shared ownership of sustainable development goals. This shows that good logistics collaboration not only creates economic stability, but also strengthens social cohesion and a sense of collective responsibility for the environment.

From the perspective of supply chain resilience, collaboration between actors has also been proven to be able to increase adaptive capacity to external shocks such as pandemics, natural disasters, and global market fluctuations. Based on the UNESCAP study (2023), countries with strong multi-level governance coordination mechanisms show faster supply chain recovery than countries that still rely on centralized logistics systems. Collaboration-based mechanisms allow for a more flexible distribution of resources as well as minimize the risk of systemic failures in the transportation network. This is reinforced by the findings of Rahman et al. (2023) who show that in Indonesia, synergy between the public and private sectors in data-driven logistics accelerated the recovery of food supply during the COVID-19 pandemic crisis. In this context, cross-sector collaboration serves as a socio-economic buffer system that maintains supply resilience and price stability at the national and regional levels.

However, the economic and social benefits of this collaboration are inseparable from the challenges of implementation. Inequality of digital and economic capacity between ASEAN countries remains a major obstacle in building inclusive logistics collaboration. Chin et al. (2021) highlight that countries with more advanced technological infrastructures such as Singapore and Malaysia tend to be major distribution hubs, while developing countries such as Myanmar and Cambodia still play a role as logistics recipients. This imbalance has the potential to widen the social and economic gap in the region if it is not balanced with benefits redistribution policies and technological capacity building in lower-middle-income countries. This is where progressive and collaborative public policy intervention comes in. Kasrim (2025) emphasized that to realize a fair and sustainable logistics ecosystem, multi-stakeholder collaboration must be accompanied by adaptive governance mechanisms that encourage equitable access to technology and knowledge transfer between countries.

In addition to direct economic and social impacts, multi-stakeholder collaboration also creates spillover effects on the environmental dimension and sustainable governance. For example, the implementation of data-driven green logistics in Thailand and Malaysia has reduced transportation carbon emissions by 9% between 2018–2023 (ASEAN Centre for Energy, 2023). This reduction is achieved through route optimization, increased fuel efficiency, and the use of electric vehicles for short-distance transportation. Socially, the success of the project has encouraged increased public awareness of the importance of an eco-friendly lifestyle and sustainable consumption. On the other hand, the integration of digital logistics systems also strengthens public policy accountability, as all transaction data and the movement of goods can be tracked transparently by various parties.

At the regional level, the economic and social implications of multi-stakeholder collaboration have the potential to strengthen ASEAN's resilience as an economic bloc resilient to global volatility. When cross-sector collaboration is strengthened, the risk of disruption due to geopolitical conflicts, climate change, and health crises can be minimized through faster, data-driven cross-border coordination. Lee et al. (2022) affirm

that the success of sustainable logistics integration in Southeast Asia will serve as a model for other developing regions as it shows how collaboration between actors can drive economic growth while protecting social and ecological balance. Therefore, collaborative strategies need to be continuously improved not only through technology, but also through policies that foster economic justice, transparency, and equal access to resources.

Thus, the economic and social implications of multi-stakeholder collaboration in sustainable logistics not only strengthen regional supply chain efficiency, but also become an important instrument in ASEAN's sustainable development. This collaboration encourages the creation of more equitable economic integration, strengthens social cohesion, and builds structural resilience to global crises. In the long term, an adaptive and data-driven collaborative approach is expected to be able to shape a Southeast Asian logistics ecosystem that is not only economically competitive, but also socially just and environmentally sound.

CONCLUSION

The results of this study confirm that multi-stakeholder collaboration is a strategic foundation in realizing a sustainable logistics system in the Southeast Asian region. The application of collaborative principles involving the government, the private sector, academia, and civil society has been proven to improve economic efficiency, strengthen market integration, and create inclusive social value. This approach also contributes to the resilience of regional supply chains by strengthening cross-border coordination, accelerating digitalization, and reducing the risk of disruption due to geopolitical factors and climate change. The findings of the study show that sustainable logistics transformation is not only determined by technological advancements, but also by the ability of governance to integrate social, economic, and environmental dimensions in a balanced manner. Thus, multi-stakeholder collaboration is not only a technocratic instrument, but also an adaptive governance mechanism that is able to bridge cross-sectoral interests for the creation of a resilient and equitable green supply chain ecosystem.

In practical terms, this study recommends the need to strengthen a framework for data-based collaborative governance and cross-sectoral transparency at the ASEAN regional level. The government needs to encourage data interoperability policies and harmonization of logistics regulations between countries to facilitate cross-border collaboration. Meanwhile, the private sector and financial institutions are expected to expand participation in green logistics projects as well as build digital capacity for MSME actors so that they can actively participate in modern supply chains. Academics and research institutions need to play a greater role in providing empirical evidence and science-based recommendations to policymakers. As reminded by Kasrim (2025), the success of sustainable logistics depends on the ability of all stakeholders to make collaborative use of technology and information in creating an efficient, inclusive, and adaptive logistics system to change. With sustainable synergy between public policy, technological innovation, and community participation, Southeast Asia has the potential to become a regional model in the development of green supply chains that drive sustainable economic growth and collective social well-being.

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