

International Doctoral Colloquium 2026

Export Logistics Efficiency in East Kalimantan: A Focused Cost Structure and Performance Perspective

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Abstract. This study examines export logistics efficiency in East Kalimantan by integrating cost aggregation and Importance–Performance Analysis (IPA). The research is motivated by the province’s strong dependence on exports and the persistence of logistics bottlenecks that weaken regional competitiveness. Primary and secondary data were analyzed to identify the dominant components of export logistics costs, evaluate key performance dimensions, and formulate policy priorities. The findings show that the largest burden is concentrated in land, sea, and air transportation, while regulatory compliance and certification also constitute a significant share of total export logistics costs. By contrast, customs charges account for a relatively small portion of the overall burden. The IPA results indicate that infrastructure, international shipment, and logistics competence are the most critical dimensions because they are perceived as highly important but still perform poorly. These results imply that export efficiency in East Kalimantan cannot be improved through administrative reform alone; it requires integrated interventions in connectivity, service capability, scheduling reliability, and logistics digitalization.

Keywords: export logistics, cost aggregation, logistics performance, East Kalimantan, policy efficiency

I. Introduction

East Kalimantan is one of the most strategically positioned provinces in Indonesia’s regional economy. Its importance derives from three interrelated features: the abundance of natural resources, the strong contribution of exports to regional income, and the province’s role within the wider economic structure of Kalimantan. The final report that underpins this article notes that East Kalimantan contributed 47.29 percent of value added in Kalimantan in 2024, making it the largest provincial contributor in the island economy. The same report also shows that the province recorded an economic growth of 6.17 percent, with net exports contributing 2.49 percentage points, confirming that export performance continues to be a key driver of provincial growth. (BPS-Statistics Indonesia, 2025).

These statistics reveal that exports in East Kalimantan are not marginal or supplementary. They are integral to the province’s macroeconomic trajectory. Yet this dependence also creates a structural challenge. A region that relies heavily on exports is highly exposed to shifts in global demand, commodity prices, exchange rate changes, and the quality of trade-supporting systems. When the logistics chain becomes costly, slow, or uncertain, the province’s comparative advantage in production cannot be fully translated into competitive performance in international markets. (BPS-Statistics Indonesia, 2025; Todaro & Smith, 2020; Salvatore, 2013).

The logistics issue is particularly important for East Kalimantan because the province does not operate in the same spatial conditions as major export hubs in Java. The movement of goods is shaped by longer domestic distances, uneven infrastructure quality, dependence on port connectivity, and frequent reliance on transshipment routes before goods reach final destination markets. This means that the cost of exporting from East Kalimantan is not determined solely by one direct shipment to a foreign market. In practice, it is determined by a layered chain that begins with domestic movement from production areas to local ports, continues toward larger hubs, and only then enters the international route. (World Bank, 2023; UNCTAD, 2021; Notteboom et al., 2022).

The need for action is also reinforced by national evidence. Logistics costs in Indonesia are high relative to many Southeast Asian peers, at around 23 percent of GDP, while the country’s Logistics Performance Index (LPI) remains behind that of several ASEAN economies. This broader situation is even more relevant for East Kalimantan as the province has longer distribution routes, limited direct international

shipping options, and a logistics ecosystem that is still uneven in quality and capacity. (World Bank, 2023; Arvis et al., 2024).

Against this background, this article presents the findings of an empirical study on export logistics efficiency in East Kalimantan. The analysis is focused on the cost structure faced by exporters, the performance dimensions that most constrain logistics operations, and the policy priorities needed to strengthen regional export competitiveness. To keep the article aligned with colloquium requirements, the presentation is selective, but the argument is built as a research paper rather than a descriptive summary.

The article is guided by a simple but important proposition: the efficiency problem of East Kalimantan's export system can be understood more clearly when two dimensions are studied together, namely the structure of export logistics costs and the performance of the logistics system itself. Cost structure shows where firms spend money, while performance assessment explains why those costs persist. The combination of these perspectives creates a more complete diagnosis than simply asking whether logistics costs are high. (Rushton et al., 2017; World Bank, 2023).

This study also addresses a practical research gap. Much of the discussion on logistics efficiency in Indonesia still takes place at the national level, using aggregate indicators and inter-country comparisons. Such studies are useful, but they often obscure the heterogeneity of logistics conditions across provinces. East Kalimantan offers a distinctive case because it is economically strategic, geographically dispersed, and structurally dependent on export logistics chains that extend beyond the province before reaching international markets. A province-level focus is therefore necessary if policy recommendations are to become operational rather than generic. (World Bank, 2023; Arvis et al., 2024).

Based on this background, the article has three objectives. First, it identifies the main components that dominate export logistics costs in East Kalimantan. Second, it explains which logistics performance dimensions are most problematic from the perspective of exporters. Third, it derives a concise policy agenda for improving efficiency in a province whose export competitiveness depends on both physical and institutional logistics quality. In short, the article is not intended to replace the full report, but to distill its strongest analytical message into a more concise and discussion-oriented format. (World Bank, 2023; Rushton et al., 2017).

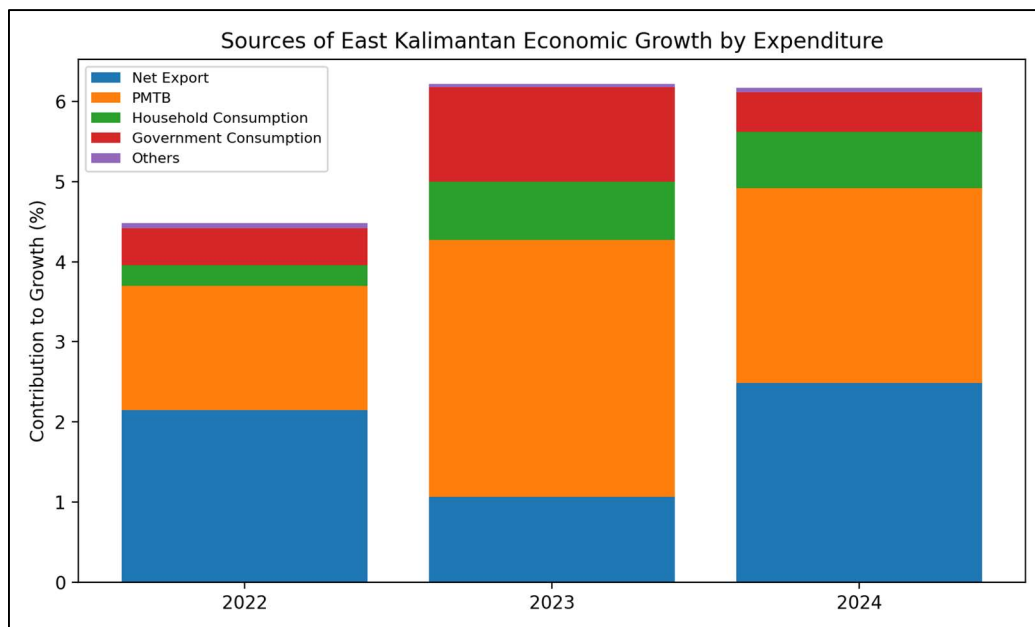


Figure 1. Sources of East Kalimantan economic growth by expenditure, 2022–2024.

Source: BPS-Statistics Indonesia (2025), processed by the authors.

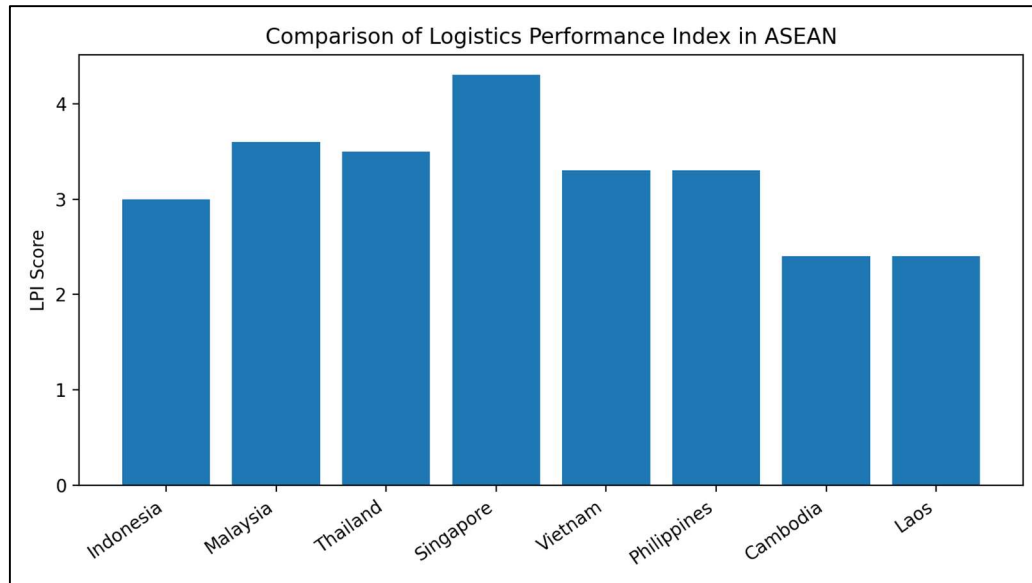


Figure 2. Comparison of Logistics Performance Index scores in selected ASEAN countries.

Source: World Bank (2023) and Arvis et al. (2024), processed by the authors.

These two figures strengthen the empirical framing of the article. The first confirms the strategic role of exports in East Kalimantan's growth structure, while the second positions the province's logistics challenge within Indonesia's broader competitiveness gap relative to several ASEAN peers. (BPS-Statistics Indonesia, 2025; World Bank, 2023).

II. Literature Review

The concept of logistics has evolved from a narrow concern with distribution and transportation into a broader managerial function that integrates goods movement, information flow, service coordination, and time-space utility. In contemporary supply chain literature, logistics refers to the planning, implementation, and control of the movement and storage of goods and related information from origin to consumption in an efficient and effective manner. This broader perspective is important because exporters do not experience logistics as a single cost item. They experience it as a chain of interconnected processes, each with its own time and cost consequences. (Rushton et al., 2017).

In export activities, logistics cost refers to the set of expenditures required to move goods from the place of production to the foreign buyer. These expenditures often include inland transportation, terminal handling, documentation, taxes and charges, sea or air transport, warehousing, and final delivery costs. The analytical value of this definition lies in its cumulative character. What weakens competitiveness is not only the size of one individual cost component, but the total burden created when many costs accumulate across the chain. (World Bank, 2023; Harrison & van Hoek, 2011).

A cost aggregation approach is therefore well suited to the analysis of export logistics. Rather than treating cost as a single undifferentiated number, the approach decomposes logistics expenditure into component parts and then aggregates them into a total export logistics cost. The logic is straightforward: once each stage of the chain is made visible, it becomes easier to identify where the largest burdens occur, which stages are likely to be inefficient, and which policy interventions might generate the highest returns. For regional export systems such as East Kalimantan, the approach is particularly relevant because route structure and institutional fragmentation can strongly influence the composition of costs. (Hamalainen et al., 2017; Harrison & van Hoek, 2011).

The literature on trade logistics also emphasizes that cost is inseparable from performance. Infrastructure quality, customs and border management, shipment reliability, logistics service competence, tracking capacity, and timeliness all influence whether logistics systems are efficient. This is why the Logistics Performance Index developed by the World Bank has become an influential benchmark in trade and logistics studies. The six dimensions of the LPI provide a useful interpretive framework because they connect operational conditions with competitive outcomes. (World Bank, 2023; Arvis et al., 2024).

Within this framework, infrastructure refers not only to the existence of roads, ports, warehouses, and terminals, but also to their quality, integration, and capacity to support reliable movement. International shipment concerns the availability of competitively priced and predictable shipping services. Logistics competence refers to the quality of logistics service providers and the skills of actors who manage logistics activities. Customs reflects the efficiency of procedures at the border. Tracking and tracing refers to the ability to track shipments, while timeliness refers to whether deliveries can be made within the scheduled times. These dimensions are analytically useful because a logistics system can perform relatively well in one dimension but poorly in another. (Notteboom et al., 2022; Rushton et al., 2017).

The East Kalimantan case demonstrates why this multidimensional perspective matters. In this study, customs costs form only a small share of total logistics cost, yet the total burden remains high because inefficiency is concentrated in transportation, connectivity, shipment arrangements, and logistics service capability. This means that logistics reform must be aimed at the wider ecosystem of export movement, not only at administrative procedures.

Another important point in the literature is the role of geography in shaping logistics outcomes. Regions that depend on indirect routes or transshipment hubs often face higher cost exposure because their export systems involve extra handling, additional waiting time, and reduced flexibility in scheduling. For East Kalimantan, where many exports move first toward Surabaya or other hubs before continuing internationally, the cost chain becomes longer than the simple origin-destination model usually assumed in aggregate trade analysis. The literature on maritime transport and regional logistics suggests that under such conditions, transport frequency and service concentration become major determinants of cost. (UNCTAD, 2021; Notteboom et al., 2022).

The reviewed literature therefore supports the analytical choice of this paper. Export logistics efficiency is best understood as an interaction between cost composition and system performance. Cost aggregation reveals the anatomy of the burden, while the logistics performance perspective reveals the institutional and operational reasons for that burden. This combined view provides the theoretical basis for examining East Kalimantan not only as an exporting province, but as a logistics system whose competitiveness depends on how smoothly and affordably goods move through a geographically layered chain. (World Bank, 2023; Rushton et al., 2017).

III. Research Method

This study employs a mixed analytical design to examine export logistics efficiency in East Kalimantan. The empirical focus is on three interrelated questions: which cost components dominate export logistics expenditure, which logistics dimensions are perceived as most important yet underperforming, and what policy directions are most relevant for improving efficiency. The research combines descriptive analysis, export logistics cost aggregation, and Importance–Performance Analysis (IPA). (Rushton et al., 2017; World Bank, 2023).

The first analytical approach is descriptive analysis. Descriptive analysis is used to summarize the macroeconomic significance of exports in East Kalimantan, the general logistics setting faced by exporters, and the broad patterns of obstacles identified in the field material. In this article, descriptive analysis serves as a contextual bridge. It does not attempt to prove causal relationships through statistical inference, but rather to organize evidence in a way that makes the province's logistics structure intelligible and policy relevant. (BPS-Statistics Indonesia, 2025; World Bank, 2023).

The second analytical approach is export logistics cost aggregation. Total export logistics cost is conceptualized as the sum of cost items incurred from the initial inland movement of goods to the final delivery stage in the export chain. This approach makes it possible to identify the dominant burden within the logistics process and to distinguish between transport-related, administrative, and service-related costs. (Hamalainen et al., 2017; Harrison & van Hoek, 2011).

$$\text{Total Logistics Export Cost} = C_{land} + C_{port1} + C_{tax} + C_{sea} + C_{port2} + C_{warehouse} + C_{delivery}$$

In this expression, C_{land} denotes inland transport from production sites to the local port, C_{port1} denotes handling and port service costs on the export side, C_{tax} denotes export-related taxes and charges, C_{sea} denotes sea shipment cost to the destination market, C_{port2} denotes destination-side unloading and handling, $C_{warehouse}$ denotes storage cost, and $C_{delivery}$ denotes final delivery to the buyer. The significance of the model is not merely arithmetical. It allows the analyst to identify which stages of the

chain are disproportionately expensive and therefore deserve closer policy attention. (Harrison & van Hoek, 2011).

The third analytical approach is Importance Performance Analysis, or IPA. IPA is used to compare two dimensions for each logistics component: its perceived importance for exporters and its actual or perceived performance. By placing each component into a quadrant, the method helps distinguish between dimensions that perform adequately and dimensions that become urgent priorities. In the East Kalimantan study, the components assessed include customs, infrastructure, international shipment, logistics competence, tracking and tracing, and timeliness. (Arvis et al., 2024).

A key advantage of IPA in this context is that it translates exporter perceptions into a prioritization framework. High cost alone does not automatically indicate that a component is the best reform target. Some dimensions may be expensive but not decisive for exporter performance, while others may impose strategic constraints even if their direct cost contribution is not the largest. IPA therefore complements cost aggregation by showing which logistics dimensions matter most to the functioning of the export system. (Arvis et al., 2024; World Bank, 2023).

Because the article is structured for colloquium purposes, only the core analytical stages are presented in the main text. Detailed scoring sheets, expanded respondent profiles, route-specific illustrations, and supporting appendices are omitted so that the paper remains focused on the main empirical findings, interpretation, and policy implications.

Table 1. Analytical Design

Objective	Method	Analytical focus	Expected policy use
Identify dominant cost components	Cost aggregation	Transport, handling, compliance, customs	Target large cost items directly
Map underperforming logistics dimensions	IPA	Infrastructure, shipment, competence, timeliness	Prioritize strategic interventions
Explain provincial context	Descriptive analysis	Export role, spatial structure, logistics setting	Link technical findings to regional development

Source: developed by the authors based on the research design and analytical framework used in this study.

IV. Results and Discussion

Results

The first set of findings concerns the structure of export logistics costs. The analysis shows that physical transportation dominates the export cost profile in East Kalimantan. Land transport, sea freight, and air freight collectively account for the largest share of logistics expenditure, indicating that the most substantial burden arises from the movement of goods rather than from purely administrative charges.

The dominance of transportation components can be explained by the province's spatial and operational structure. East Kalimantan is not always able to ship directly to final export destinations. Many shipments must first move through domestic routes and then pass through transshipment hubs, especially Surabaya, before they continue internationally. This routing pattern creates additional transport stages, extra handling requirements, and a greater dependence on schedule coordination. As a result, cost accumulation is embedded into the geography of the logistics chain itself.

The second finding is that compliance and certification represent a significant component of the cost burden. The results indicate that regulatory compliance and certification contribute more than 18 percent of total export logistics costs. This is an important result because it shows that exporters face not only transport-related inefficiency but also institutional costs tied to documentation, standards, and procedural requirements.

The third finding is that customs charges contribute only a relatively small share to total logistics cost. The customs component is estimated at around 5 percent for sea shipment and around 0.5 percent for air shipment. This suggests that although customs reform remains important, it is not the principal source of the cost burden in East Kalimantan's export system.

The fourth finding comes from the IPA results. Three components occupy the quadrant of high importance and low performance: infrastructure, international shipment, and logistics competence. These dimensions therefore emerge as the most urgent priorities for policy intervention because exporters consider them critical to efficiency, yet current performance is still inadequate.

Infrastructure emerges as a priority because export logistics depends on reliable road access, port services, handling facilities, and supporting equipment. When these conditions are weak or fragmented, costs rise and time uncertainty increases. International shipment becomes a priority because East Kalimantan exporters still face limited container availability, insufficient sailing frequency, and uncertain schedules. Logistics competence becomes a priority because system efficiency depends not only on assets but also on the capability of firms, service providers, and administrative actors to manage the chain effectively.

A fifth result concerns reliability and scheduling. The findings show that limited export container availability and the low frequency of shipping schedules often lead to cargo accumulation, longer waiting times, and higher indirect costs. This pattern is especially relevant in a province where many flows still depend on transshipment arrangements and indirect connections to final international destinations.

A sixth result concerns human resources and digital utilization. The study indicates that the capacity of exporters and logistics actors to use digital systems, including customs-related applications and shipment monitoring tools, is still uneven. As a consequence, digitalization has not yet fully translated into lower transaction costs, better coordination, or faster cargo processing.

A final result worth emphasizing is the asymmetry between administrative modernization and overall logistics ecosystem performance. Customs and timeliness indicators appear relatively stronger than several other dimensions, yet exporters continue to experience high costs because transport conditions, service quality, and shipping arrangements remain structurally weak. Efficiency improvements are therefore constrained by the weakest links in the chain rather than by the best-performing administrative components.

Table 2. Condensed summary of the main empirical findings.

Finding	Evidence condensed from report	Implication
Dominant cost structure	Land, sea, and air transport form the largest share of export logistics costs.	Connectivity and freight efficiency are core reform targets.
Compliance burden	Regulatory compliance and certification contribute more than 18% of total logistics costs.	Procedural simplification can generate meaningful savings.
Small customs share	Customs charges remain relatively low compared with other components.	Main bottlenecks lie beyond customs fees.
Priority weaknesses	Infrastructure, international shipment, and logistics competence are highly important but underperforming.	Provincial strategy should focus on these three dimensions first.
Operational frictions	Container scarcity, schedule uncertainty, weak HR, and incomplete digitalization persist.	Interventions must combine hardware and software reforms.

Source: authors' field analysis (2025).

Discussion

The findings confirm a central insight from logistics literature: competitiveness depends on the combined effect of transport conditions, institutional quality, and service capability. For East Kalimantan, the export problem is not simply that logistics is expensive. It is that the cost burden is generated by a chain structure that amplifies inefficiency at multiple stages. Because transport dominates the cost structure, reforms that fail to improve physical connectivity and route reliability are unlikely to produce large reductions in total export logistics cost. (Rushton et al., 2017; World Bank, 2023).

The relatively small customs cost component has an important interpretive implication. Many public discussions of logistics inefficiency assume that customs procedures are the principal obstacle. The East Kalimantan evidence suggests a more differentiated story. Administrative reform may indeed have improved some aspects of export processing, but physical transport and service conditions remain the larger constraint. This finding is valuable because it helps redirect policy attention toward dimensions that still generate the highest burden.

The IPA priority quadrants strengthen this argument. Infrastructure, international shipment, and logistics competence are not only weak; they are weak in areas that firms consider highly important. This combination transforms them from general development concerns into urgent trade policy priorities. Infrastructure matters because without better links between production areas and logistics gateways, exporters continue to absorb high inland movement costs. International shipment matters because the availability and predictability of shipping services shape both cost and business certainty. Logistics competence matters because a complex export system cannot function efficiently without capable providers, operators, and users.

The East Kalimantan case also shows why province-level analysis matters. A national logistics indicator might suggest a general need for reform, but it cannot reveal how transshipment dependence, provincial geography, and exporter capability combine to generate cost burdens in a specific region. The present article therefore contributes a more grounded policy diagnosis. Its novelty lies in showing how a provincial export system can be interpreted through the simultaneous use of cost aggregation and performance mapping.

This novelty is modest but meaningful. The paper does not claim to invent a new theory of logistics. Rather, it contributes an empirically focused framework for understanding why a resource-rich exporting province still faces cost inefficiency. By placing cost composition and system performance side by side, the study reveals that the strongest obstacles are not hidden in one isolated administrative stage, but are distributed across transport, scheduling, capability, and support facilities. To sharpen the contribution of the article for colloquium purposes, two compact additions are important: a state-of-the-art mapping that clarifies the research gap and a policy roadmap matrix that translates the findings into phased provincial action. These additions do not change the substance of the article, but they make the academic positioning and policy relevance more explicit.

Table 3. State-of-the-art mapping and research gap of the colloquium article.

Analytical stream	What prior literature generally emphasizes	Gap in existing discussion	Position of this article
National logistics competitiveness	Macro indicators such as LPI, national logistics cost, customs efficiency, and trade facilitation.	National studies often understate territorial asymmetry and province-specific export bottlenecks.	The article brings the discussion down to East Kalimantan and shows that local geography and connectivity strongly shape logistics cost.
Export cost structure	Transport, warehousing, handling, and compliance are treated as general components of logistics cost.	Few studies repackage detailed cost aggregation evidence into a concise province-level export efficiency narrative.	The article condenses the final report into a focused cost structure perspective suitable for colloquium discussion.
Logistics performance analysis	LPI dimensions are commonly used to compare countries or national systems.	The linkage between performance dimensions and provincial export obstacles is often not operationalized clearly.	The article uses IPA results to identify which dimensions are high-importance but low-performance in East Kalimantan.
Policy relevance	Recommendations often remain broad, emphasizing infrastructure and facilitation in general terms.	There is limited translation from evidence to sequenced regional policy priorities.	The article proposes a concise policy roadmap that links findings, actors, and expected outcomes in a phased manner.

Source: synthesized by the authors from the reviewed literature and empirical analysis.

From a policy perspective, the findings point to at least four priorities. First, East Kalimantan needs stronger multimodal connectivity, especially between production centers, roads, local logistics nodes, and outbound port routes. Second, the province needs more complete export-support facilities so that firms do not have to conduct compliance-related processes outside the region. Third, public and private actors need to improve the reliability of international shipment by increasing coordination with shipping lines, ports, and container providers. Fourth, logistics capability building should become a standing policy agenda, not an occasional program, because digital systems and modern logistics procedures are only effective when users have adequate competence. The policy implications can be expressed more clearly through a phased roadmap so that the article contributes not only diagnostically, but also operationally.

Table 4. Indicative policy roadmap for improving export logistics efficiency in East Kalimantan.

Time horizon	Policy priority	Main actor(s)	Indicative action	Expected effect
Short term	Administrative streamlining	Provincial government, port agencies, exporters	Simplify certification flow, strengthen digital document processing, and reduce repetitive compliance steps.	Lower compliance cost and faster export preparation.
Short to medium term	Scheduling and service reliability	Shipping lines, port operators, logistics providers	Improve container availability, shipment frequency, and coordination of booking and handling.	Reduced uncertainty and lower delay-related costs.
Medium term	Multimodal connectivity	Provincial government, national ministries, transport agencies	Upgrade road access to logistics nodes and improve connection between inland production areas and ports.	Lower inland transport cost and stronger supply chain integration.
Medium to long term	Logistics competence and digitalization	Universities, training institutions, firms, local government	Develop logistics skills, data-based monitoring, and digital coordination platforms.	Higher service quality and better tracking, tracing, and responsiveness.
Long term	Regional export ecosystem strengthening	Provincial government, business associations, national trade institutions	Align infrastructure, trade promotion, and logistics reform with East Kalimantan's export transformation agenda.	More resilient and competitive export logistics system.

Source: developed by the authors from the empirical findings and policy interpretation of this study.

These priorities should also be understood within the broader context of regional transformation. East Kalimantan is expected to strengthen diversification, upgrade value-added activities, and connect more

firms to non-traditional export opportunities. Such objectives will be difficult to achieve if logistics costs remain high and shipment reliability remains weak. Under these circumstances, logistics reform should be viewed not only as an efficiency policy but also as an enabling condition for structural change.

The article's selective format inevitably creates some limitations. Because the paper is compressed for colloquium purposes, it does not reproduce the full range of route-level tables, extended respondent details, or supporting appendices that would appear in a longer research report. Nevertheless, the core empirical evidence presented here is sufficient to identify the main cost burden, diagnose the most important performance gaps, and formulate practical policy priorities.

V. Conclusion

This study shows that the main burden on export logistics efficiency in East Kalimantan lies in the cost and performance structure of transportation and logistics services rather than in customs charges alone. The empirical results indicate that land, sea, and air transportation dominate the export logistics cost profile, while compliance and certification also constitute a significant burden. At the same time, the IPA results identify infrastructure, international shipment, and logistics competence as the most urgent weak points because they combine high importance with low performance.

The main implication is that improving export competitiveness in East Kalimantan requires more than administrative simplification. What is needed is an integrated efficiency agenda that combines better connectivity, more reliable shipping services, stronger export-support facilities, and sustained capability development among firms and logistics actors. The practical novelty of this article lies in its provincial perspective and its integrated analytical lens. By linking cost anatomy with logistics performance, the paper offers a concise but robust explanation of why export logistics remains inefficient and where reform should begin. For colloquium discussion, this condensed form is valuable because it translates a large final report into a sharper policy argument while preserving the original evidence base.

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