



Potential Socioeconomic Impacts: Proposed Batam–Johor Roll-On/Roll-Off Route and Its Effects on Microenterprises and Border Tourism

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ABSTRACT

The planned Batam–Johor Ro-Ro route is viewed as strategic for reducing logistics costs, speeding up transit, and strengthening flows of trade and tourism. This research aims to investigate the potential of the Batam–Johor Ro-Ro shipping route as a driver of economic development and social strengthening for border communities. This descriptive qualitative study used purposive sampling of 15 MSME actors around Bintang 99 Persada Port; data from in-depth interviews, field observations, and official documents were thematically analysed with triangulation. The findings showed that most respondents hold positive views toward the Ro-Ro plan (67%), while 20% indicated a need for support and 13% remain neutral, expecting increased customer traffic, the formation of a tourism–culinary–transport service cluster, expanded market access for Batam products to Johor/Malaysia, and multiplier effects on income and employment.

INTRODUCTION

Maritime connectivity is not merely about shipping routes that link two ports, but about how the flows of goods, ideas, and opportunities move across borders to strengthen the community's economy. In border regions such as Batam, sea connectivity carries deeper significance because it directly touches the social, economic, and even cultural lives of coastal communities. According to Khadim et al. (2021), the development of port infrastructure and improvements in logistics performance play a major role in driving regional economic growth. Aligned with this, the Indonesian government has made maritime connectivity an important part of its national development strategy through a network of Roll-On/Roll-Off (Ro-Ro) vessels. One strategic project currently under review is the Batam–Johor route, which is expected to become a link for cross-country trade and tourism. Situated near Singapore, Batam holds a highly strategic position. This Ro-Ro route is projected to reduce logistics costs by up to 15% and shorten cross-border delivery times (Ikaputra, 2024; Nurseit, 2025; Zheng et al., 2021). Moreover, this easier access is estimated to increase cross-border tourist flows by 8–10% per year (Khalid et al., 2022). In other words, the Batam–Johor Ro-Ro project will not only affect the

transportation and trade sectors but also open significant opportunities for local MSMEs to grow and expand their market reach

Maritime connectivity, understood as the extent to which ports and maritime shipping networks are linked to global routes, has consistently been shown to stimulate regional economic growth by improving market access, logistics efficiency, and trade integration, as evidenced by vessel-movement, satellite-based port expansion, and night-light economic activity analyses showing sustained growth effects when port connectivity increases (Jarumaneeroj et al., 2023). This relationship is especially strategic for coastal and archipelagic regions where sea transport functions as the main distribution backbone (Du et al., 2023; Kanrak et al., 2023), because stronger connectivity can reduce shipping costs and transit time while enabling local commodities to reach larger international markets, thereby supporting export expansion and competitiveness (Verschuur et al., 2022). In the context of wider regional trade arrangements, shipping connectivity, often proxied by indices such as the Liner Shipping Connectivity Index (LSCI), is also associated with economic growth and financial development, although it raises sustainability concerns that require policy attention (Bekteshi et al., 2024). Complementing these macro findings, studies on port infrastructure and logistics performance emphasize that investments in port capacity, maritime routes, and integrated logistics facilities can increase trade volume, lower logistics costs, and improve commodity competitiveness, issues that are particularly critical in Indonesia where infrastructure gaps contribute to costly and slow distribution systems (Amin et al., 2024; Machfudiyanto et al., 2025; Sibali & Jainuddin, 2024).

Moreover, global work on bilateral port connectivity argues that coordinated infrastructure development and cross-country operational alignment enhance logistics performance and support sustainable growth outcomes (Bouazza & Benmamoun, 2023; Larson, 2021; Nguyen et al., 2025), providing a clear rationale for the Batam–Johor Ro-Ro corridor because a more direct route with fewer transshipment points and adequate port readiness can reduce distribution costs and delivery times while strengthening Batam’s product competitiveness. Finally, contemporary literature expands the lens beyond trade outcomes to regional integration and socio-economic dynamics, highlighting how Ro-Ro and container services can intensify goods flows, tourism, labour mobility, and cross-cultural exchange, while warning that connectivity gains must be balanced with environmental governance due to impacts on coastal communities and marine ecosystems (Elston et al., 2024; Khaskheli et al., 2025). Accordingly, the shift toward green ports and cleaner maritime logistics is increasingly framed as essential, emphasising clean technologies, environmental regulation, and ecosystem protection (Karagkouni & Boile, 2024; Xiao et al., 2024), alongside joint governance and intergovernmental coordination to ensure that connectivity-driven economic benefits do not produce adverse social or ecological externalities in border regions (Bouazza & Benmamoun, 2023).

The similarity between this study and previous research lies in the shared focus on strengthening tourism and MSMEs as engines of economic growth, as well as attention to factors influencing business performance and resilience. In line with Tam (2024), this study likewise positions tourism as a strategic sector that should be reinforced to support economic growth, although Tam emphasised the determinants of competitiveness and efficiency of tourism firms. With Vaz et al. (2025), the similarity was evident in the orientation toward enhancing destination competitiveness and the importance of systemic interventions in destination governance to improve tourist experience and sustainability. Meanwhile, with Marongedza et al. (2024), this study shared a focus on the socio-economic dimensions of micro/informal business actors and the influence of external factors on the resilience and recovery opportunities of small businesses amid changes in economic and policy environments.

The differences between this study and earlier research are primarily reflected in the object of study, level of analysis, and the policy context examined. Tam (2024) focused on the firm level of post-COVID tourism companies in Vietnam by emphasising internal organisational and market factors affecting competitiveness and efficiency, whereas this study is grounded in cross-border maritime

connectivity infrastructure planning and policy through the Batam–Johor Ro-Ro route to assess regional potential, readiness, and impacts on border tourism and MSMEs. Vaz et al. (2025) employed a systematic literature review to map developments and the research agenda of “smart tourism destinations” based on digital infrastructure and smart governance, whereas this study is location-specific and contextual, oriented toward physical-maritime connectivity and its implications for tourist flows, MSME logistics, and Batam–Johor economic integration. Marongedza et al. (2024) examined the impacts of the pandemic crisis on a specific group, single mothers who are informal traders, within one urban community, emphasising lived experiences and survival strategies, while this study investigates a broader development intervention in the context of cross-national border economies, focusing on growth opportunities and ecosystem restructuring for MSMEs and tourism.

The novelty of this study lies in integrating a cross-border maritime connectivity perspective with a simultaneous analysis of the MSME ecosystem and border tourism within the context of the planned Batam–Johor Ro-Ro route. While Tam (2024) emphasised the internal competitiveness of tourism firms, Vaz et al. (2025) highlighted the development of smart destinations based on literature synthesis, and Marongedza et al. (2024) focused on the resilience of informal actors during crises, this study offers a more policy- and corridor development oriented contribution by examining the impacts of transport corridor construction on the economic dynamics of border regions. Accordingly, this research has the potential to explain how Ro-Ro can catalyse economic integration, expansion of MSME market access, changes in tourist mobility patterns, and the emergence of distinctive socio-economic opportunities and risks associated with border tourism and cross-border trade between Indonesia and Malaysia.

This study focuses on how the Batam–Johor Roll-On/Roll-Off (Ro-Ro) shipping route can serve as a driver of economic and social strengthening for communities in the border region. The research examines potential logistics efficiency, the readiness of port infrastructure, and the roles of coastal communities and MSME actors in supporting cross-border maritime connectivity. In addition, it discusses forms of collaboration among the government, business actors, and local communities in managing the economic and social benefits generated. Through this approach, the Batam–Johor Ro-Ro route is expected to function as a catalyst for inclusive and sustainable regional economic growth. The main objective of this research is to analyse the extent to which maritime connectivity through the Ro-Ro route can strengthen the local economy while also encouraging regional economic integration. The results are expected to provide practical benefits for MSME development, enhancing the appeal of cross-border tourism, and formulating more inclusive border-region development policies. By integrating field data with recent literature, this study is expected to contribute insights to the development of maritime connectivity that is community-oriented and sustainability-driven.

METHOD

This study adopted a descriptive qualitative approach to provide an in-depth depiction of the potential, readiness, and socio-economic impacts of developing the Batam–Johor Roll-On/Roll-Off (RORO) shipping route on the tourism and MSME sectors in the Indonesia–Malaysia border region. This approach was selected because it enables a comprehensive explanation of on-the-ground phenomena based on the experiences, perceptions, and viewpoints of relevant stakeholders. The subjects of this study were MSME actors located around the port area (the area potentially affected by the planned/implemented Batam–Johor RORO route). The subjects were selected based on predetermined criteria: (1) MSME actors who have been operating for less than 10 years around the port area, and (2) MSME actors located in the vicinity of the port. Based on informant data, the study involved 15 MSME actors across various business types, culinary, souvenirs, travel services, transportation, handicrafts, printing, workshops, furniture, and others, so that perceptions of the economic impacts of RORO could be captured from both service- and production-oriented businesses. The most appropriate sampling technique for this context was purposive sampling (non-probability sampling), as informants were deliberately selected according to characteristics and relevance to the research focus.

In general, the research was conducted through three main stages. The first stage was preparation, which included a literature review, determination of the research focus, and the development of interview and field observation instruments. The second stage was data collection, conducted through in-depth interviews, direct observations, and documentation of activities in and around Bintang 99 Persada Port. The third stage was data analysis and conclusion drawing, involving the processing and interpretation of findings from multiple sources to address the research questions. This study emphasised three main variables: the readiness of port infrastructure, the economic effects on MSMEs and tourism, and the social responses of coastal communities. Infrastructure readiness was assessed based on the adequacy of port facilities, supporting transportation access, and local government support for RORO operations. Economic effects were analysed through changes in MSME turnover, opportunities for exporting local products, and the potential increase in foreign tourist arrivals. Meanwhile, social responses included levels of participation, perceptions of the project, and social dynamics emerging from the development of the Batam–Johor RORO route.

The data sources in this study consisted of primary and secondary data. Primary data were obtained through interviews with BP Batam and MSME actors. Secondary data were drawn from official BP Batam reports, publications from the Batam City Statistics Office (BPS Batam, 2025), government policy documents, and research outputs from institutions such as Pustrat UGM. Data validity was ensured through source triangulation by comparing interview results with observations and supporting documents to confirm consistency of information. Data analysis was conducted qualitatively through three main steps: data reduction, data display, and conclusion drawing. Data reduction was carried out to filter information relevant to the research focus. The results were then presented thematically within three main categories: infrastructure, economic, and social aspects. Finally, conclusions were drawn inductively by linking field findings with relevant theories to produce a comprehensive understanding of the readiness and impacts of the Batam–Johor RORO route on border communities. Through these stages, this study was expected not only to provide a factual overview of field conditions but also to offer community-based policy recommendations to support the development of inclusive and sustainable maritime connectivity in the Batam–Johor region.

RESULTS AND DISCUSSION

Results

The findings indicate that the planned maritime connectivity through the Batam–Johor RORO route is perceived by local business actors as a strategic opportunity to strengthen the local economy while further integrating Batam with surrounding areas, particularly Johor and Malaysia more broadly. This overview is quantitatively reflected in Fig. 1, Community Perspectives on the Planning of the Batam–Johor RORO Project, which shows that the majority of respondents hold positive views (67%), while 20% state that they require support, and 13% remain neutral.

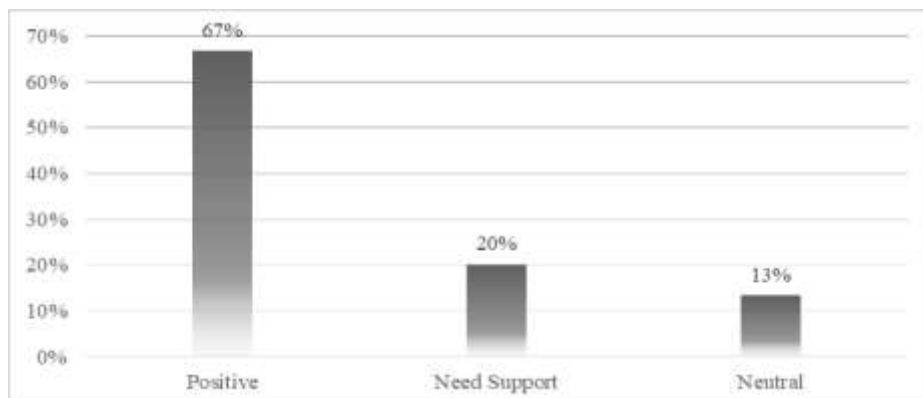


Fig. 1 Community Responses/Views on the Planning of the Batam–Johor RORO Project

These figures reinforce the in-depth interview results, particularly among small to medium business actors around the port who believe that increased flows of people and goods will directly lead to more customers, broader market reach, and the creation of new jobs. A food stall owner described very concrete day-to-day economic optimism by stating that, *“if this project plan is implemented, I will have more customers, especially drivers and port workers. Once it is truly operational, I’m confident my turnover can increase because foreign tourists will also come here”* (I/01). This statement reflects expectations of multiplier effects at the grassroots level arising from logistics activities and human mobility. A similar expectation was expressed by a fruit vendor who linked port crowd density with rising demand: *“if access to the port becomes busier, the chance is my fruit sales could increase”* (I/02). Thus, RORO is understood not merely as a transportation project, but as a direct lever for accelerating microeconomic circulation in the area surrounding the port. In this context, the 67% positive response shown in Figure 1 reflects the accumulated confidence of business actors in growing income opportunities, new customer flows, and spillover effects across supporting sectors.

RORO connectivity is also viewed as a trigger for the development of tourism and supporting service sectors, because the cross-country route will create a more convenient and more direct flow of tourists. A travel agent clearly emphasised this potential: *“The Batam–Johor RORO route is a big opportunity for us in the travel business. Tourists can come directly from Malaysia without transiting in Singapore. We just need to adjust tour packages and promotions”* (I/04). This indicates that service industry actors have already mapped out business adaptation steps to respond to changing tourist arrival patterns. A coffee shop owner extended this economic imagination into the realm of social spaces and tourist lifestyles, hoping that *“if the port becomes busier later, it could become a hangout place for tourists too”* (I/05). Meanwhile, a car rental business owner emphasised readiness in land transport capacity by stating, *“if the RORO route is running, there will definitely be many guests from abroad who need vehicles. We are already prepared with our fleet”* (I/07). This series of quotations suggests that the RORO project is perceived as a catalyst for forming a new economic cluster based on tourism services, transportation, and culinary businesses, providing a basis for why more respondents in Figure 1 position themselves within the spectrum of positive support. On the side of regional economic integration, the RORO route is also perceived as opening cross-border market access for Batam’s local products, meaning its impact does not stop at local crowds and transactions but extends toward regional expansion opportunities. A souvenir shop owner expressed optimism alongside the need for capacity building: *“Many tourists from Malaysia will be able to shop for Batam’s local products. But we need training on exports and packaging so our products can enter overseas markets”* (I/03), underscoring that market access requires readiness in product standards and export knowledge.

Expectations to expand market reach also emerged from a wood craftsman who stated, *“This project is good; it can open job opportunities. But we craftsmen need easier distribution access so our products can be sold to Johor or Malaysia”* (I/11). A furniture seller highlighted information gaps and the need for a stronger role from local authorities: *“I hope this project can help send furniture goods to Johor. But I’m still confused about cross-border shipping procedures. We need socialisation from BP Batam”* (I/13). This economic integration is also imagined as strengthening the identity of Batam’s products and culture. For instance, a traditional cake seller hoped that *“with this RORO project, Batam’s Malay traditional cakes can be more widely recognised”* (I/10). A batik seller similarly sought to strengthen local branding through the statement, *“Batam’s distinctive Malay batik can become the city’s identity... and a must-buy souvenir”* (I/15). In this way, RORO is understood as a tangible Batam–Johor–Malaysia bridge through tourist flows, product distribution, and the legitimization of local cultural identity in a wider market. However, Figure 1’s finding that 20% of respondents “require support” confirms that this optimism is not unconditional. At the policy and infrastructure level, several respondents emphasised the need for area management and basic facilities. The fruit vendor not only hoped for more buyers but also stressed prerequisites for public space comfort: *“the government should help with cleanliness facilities and parking spaces so buyers feel comfortable too”* (I/02). The coffee shop owner voiced concerns about spatial and traffic governance: *“area*

arrangement so it won't be congested and is cleaner" (I/05).

In terms of operating cost competitiveness, a family restaurant owner linked business sustainability to inflationary pressure on inputs: *"basic commodity prices are rising now, so we need support for raw materials to be able to compete"* (I06). Issues of landside connectivity infrastructure also emerged strongly, such as a workshop owner who emphasised the need to improve road access to the business area: *"the road facilities leading to the workshop need to be improved so customers can come easily. Right now it can still be muddy when it rains"* (I/12). At the same time, there were concerns about the impact of heavy vehicle traffic on informal business spaces, as expressed by a roadside satay vendor: *"if many big vehicles pass by, it becomes difficult to sell on the roadside"* (I08). At the institutional and financing level, a printing business owner highlighted the need for capital to increase production capacity: *"we need additional capital to buy a new printing machine"* (I14). This aligns with the need for socialisation of export procedures and licensing strengthening, which is also implied in the furniture seller's statement (I/13) and the need to improve packaging quality voiced by the traditional food seller (I/10).

Overall, the relationship between the quantitative data in Figure 1 and the qualitative findings indicates that the positive support (67%) arises from tangible expectations of increased demand and the opening of new markets, while the group that "requires support" (20%) represents a critical awareness that the success of RORO depends on infrastructure readiness, spatial management, access to financing, and business capacity assistance so that local actors do not merely become spectators in the flow of cross-border mobility. Therefore, if the government and stakeholders can respond to the needs articulated by respondents, ranging from cleanliness and parking, congestion management, raw material stability, road improvements, mitigation of heavy-vehicle impacts, to the facilitation of financing and export literacy, the Batam–Johor RORO route has the potential to materialize as a strategic instrument that not only connects regions physically but also consolidates local economic growth and strengthens sustainable economic integration across Batam–Johor–Malaysia.

Discussion

Maritime connectivity through the Batam–Johor RORO route can strengthen the local economy while also encouraging regional economic integration because it reduces logistics costs and travel time, expands cross-border market access, and links Batam's port more closely to Malaysia's regional shipping network and global shipping routes. Theoretically, improved port connectivity has been shown to have a significant and sustained causal impact on regional economic growth around ports through port capacity expansion and increased economic activity measurable from night lights data (Abagna, 2025; Polinov et al., 2022). Similar findings in the ASEAN region indicate that maritime connectivity and trade volumes that exceed certain thresholds can drive stronger GDP growth, particularly when the quality of port infrastructure is sufficient to capture rising trade flows (Netirith & Ji, 2022; Shen, 2023). In the Batam–Johor context, this mechanism is reflected in the expectations of local business actors, food stalls, fruit vendors, coffee shops, car rentals, as well as artisans and souvenir sellers, who see RORO as a direct trigger for increased customers, market expansion into Johor/Malaysia, the formation of new tourism, culinary, transport service clusters, and multiplier effects on turnover and job creation; this pattern is consistent with ferry/RORO development studies showing significant multiplier effects for MSMEs and local government revenue in the Lake Toba tourism area (Hulu, 2022; Widianingsih et al., 2023).

At the network scale, stronger RORO connectivity positions Batam as a more important node in the regional shipping network, thereby increasing the significance of the port node and improving the smoothness of flows of goods and people; global shipping network research shows that increasing edge connectivity and the role of key nodes can optimize port layout and overall shipping network performance, which in turn supports smoother international trade and economic integration (Duan et al., 2024; Kang et al., 2022). At the macro level, experiences from maritime route initiatives such as the 21st Century Maritime Silk Road show that cross-country maritime connectivity development can

improve port efficiency and promote regional economic interconnectedness through investment, industrialisation, and port infrastructure improvements (Baafi, 2025). Thus, if the prerequisite needs identified by respondents, such as improved road access, port area arrangement, sanitation and parking facilities, raw material stability, access to financing, and export assistance, are met, the Batam–Johor RORO route has the potential not only to mobilize the micro-economy around the port but also to integrate Batam more tightly into Johor’s and Malaysia’s economic system in a sustainable manner, in line with global empirical evidence that maritime connectivity is one of the main levers for regional growth and economic integration.

The findings of this study have advantages over the three previous studies because they are more contextual, cross sectoral, and policy oriented toward a tangible connectivity project that is being/ will be planned, namely the Batam–Johor RORO, by combining quantitative evidence of perceptions (a positive majority of 67%, 20% requiring support) and qualitative narratives from micro, small, and medium-sized business actors around the port that explain the mechanisms of everyday economic impacts (customer flows, employment, culinary-transport-tourism clusters, and export opportunities for local products). Unlike Tam (2024), which emphasized internal competitiveness factors of tourism firms in post-pandemic Vietnam, this study shows how cross-country infrastructure and policy interventions are directly perceived as drivers of the local economy; unlike Vaz et al. (2025), which was a conceptual systematic review on smart tourism destinations, this research provides highly specific field evidence on the readiness and support needs of local actors; and unlike Marongedza et al. (2024), which captured economic vulnerability due to the Covid-19 crisis among informal traders, this study highlights an anticipatory perspective toward growth opportunities alongside the conditions for success (area arrangement, sanitation-parking, mitigation of heavy vehicle traffic, access to financing, and export literacy), making its contribution more operational in designing strategies so that local actors do not merely become spectators in Batam–Johor–Malaysia economic integration.

The implications of these findings emphasise that the success of the Batam–Johor RORO plan cannot be understood merely as a transportation project, but must be positioned as an instrument of local economic development and regional integration that requires cross-sector policy design from the planning phase. Practically, the central/local government and port authorities (including BP Batam) need to prepare an integrated intervention package that locks in economic benefits for local actors: port area arrangement, provision of sanitation and parking facilities, strengthening land connectivity and managing heavy-vehicle traffic, as well as mechanisms to stabilise raw material supplies so that culinary and service MSMEs are not pressured by rising costs. At the same time, because business actors link RORO with opportunities for expansion into Johor/Malaysia, export assistance, product and packaging standardisation, literacy in cross-border procedures, and access to financing are needed so that MSMEs can upgrade and not merely become passive recipients of spillover crowds. At the governance level, these results also point to the importance of Indonesia–Malaysia institutional coordination to align SOPs for logistics, tourism, and passenger services, so that RORO can potentially shape new inclusive economic clusters, strengthen Batam’s competitiveness as a regional hub, and produce more sustainable Batam–Johor–Malaysia economic integration.

CONCLUSIONS

The results showed that MSME actors around the port generally viewed the planned RORO service as a strategic opportunity to increase customer flows, expand cross-border market access, stimulate the formation of tourism, culinary, and transport service clusters, and create multiplier effects on income and employment. Quantitatively, this optimism was reflected in a majority of positive responses (67%), while 20% of respondents stated that they require support and 13% remained neutral. The qualitative findings confirmed that such support is conditional: the success of RORO depends heavily on the readiness of port infrastructure and land access, spatial and traffic management, the availability of basic facilities (cleanliness and parking), the stability of raw material costs, access to financing, as well as assistance in export literacy and product standardisation. Thus, the Batam–Johor RORO route

has the potential to become a lever for local economic growth and inclusive, sustainable regional integration if the prerequisites of an MSME-supporting ecosystem are fulfilled in parallel with project implementation. However, this study faces limitations in the form of a restricted informant scope focusing on 15 MSME actors around the port, meaning the findings mainly reflect the perceptions of local business communities in a specific area. Moreover, because RORO is still in the planning stage, this study has not yet been able to measure real post-operation economic impacts quantitatively, and has not fully captured cross-border stakeholder perspectives (for example, business actors/authorities in Johor) as a direct comparison.

Based on the findings, suggestions can be summarised into short-term and long-term recommendations. For the short term: 1) the local government and BP Batam are expected to strengthen outreach and communication to MSME actors regarding the RORO operational plan and cross-border procedures to reduce business uncertainty, 2) carry out rapid improvements in the port area such as hygiene management, parking arrangement, and traffic flow regulation to anticipate increased mobility, 3) prioritize repairs to road access and drainage toward business areas so that daily economic activities become smoother and more comfortable, 4) organize practical training on packaging, quality standardization, and export readiness tailored to the needs of the Johor/Malaysia market, 5) open micro-financing schemes/working capital incentives for MSMEs that need to increase service and production capacity. For the long term: 1) the governments of Indonesia and Malaysia need to develop a joint governance framework that harmonizes SOPs for logistics, tourism, and passenger services (CIQ; Customs, Immigration, Quarantine) so that RORO operations are efficient and predictable, 2) strengthen investment in port capacity and hinterland connectivity, including mitigating the impacts of heavy-vehicle traffic on micro-business spaces, 3) develop an economic cluster strategy around the port with zoning and incentives that ensure local actors become the primary beneficiaries, 4) institutionalize sustainable export assistance programs, market intelligence, and the strengthening of Batam's local product branding, 5) incorporate social-environmental sustainability principles in port development so that economic growth from RORO remains inclusive, safe, and resilient in the long run.

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