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1st INTERNATIONAL CONFERENCE ON MARITIME INNOVATION AND TECHNOLOGY 2026

Title:

Role of Port - Centric Infrastructure in Passenger, Cargo, Industry, and Fisheries Services

PRESENTER:

Dasa Aprisandi & Elisabet Merida Kristia

PROGRAM STUDI TEKNIK SIPIL
INSTITUT SAINS DAN TEKNOLOGI NASIONAL
JAKARTA

June 04, 2026 | 13:00 Poltekpel Surabaya & Online

INTRODUCTION

Indonesia, as the world's largest archipelagic country, depends heavily on ports for connectivity and economic growth. However, most port functions such as passenger services, cargo logistics, industrial activities, and fisheries still operate separately rather than as an integrated system.

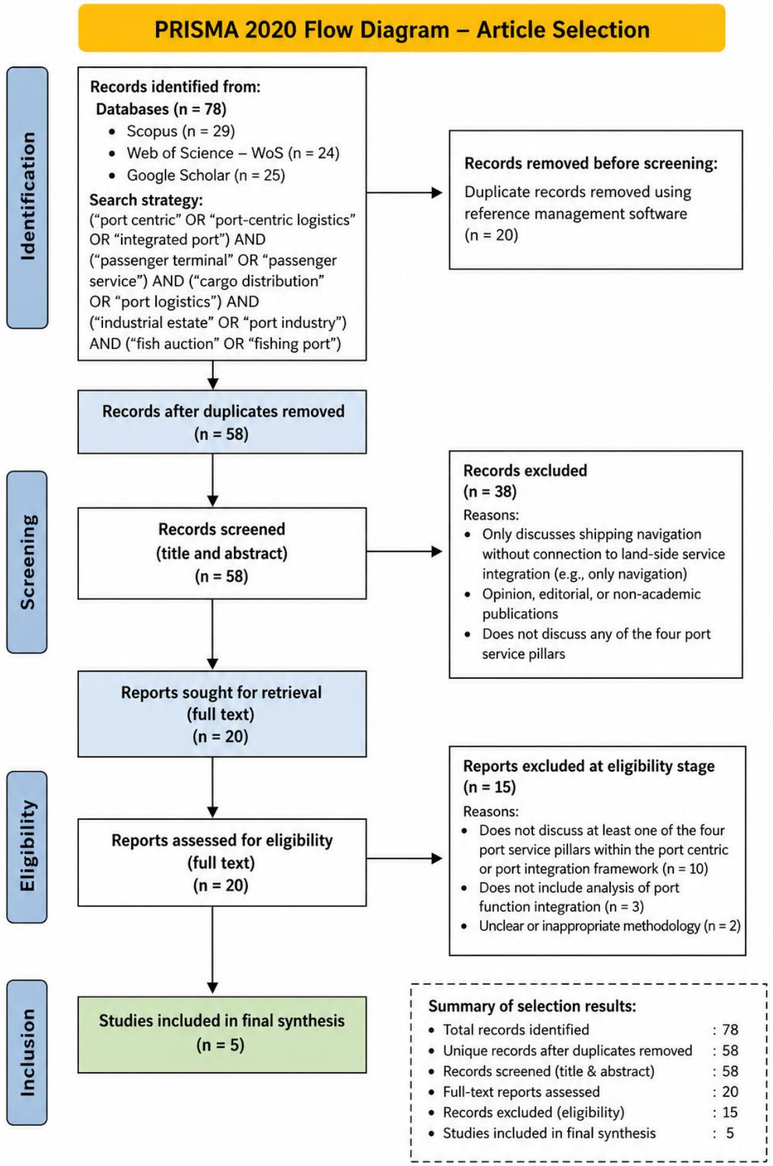
This fragmentation causes high logistics costs, inefficient infrastructure utilization, and limited regional economic development. In addition, previous studies mostly focus on only one aspect of port services, without providing a holistic port-centric perspective.

Therefore, this research aims to analyze how port-centric infrastructure can integrate those four service pillars through a Systematic Literature Review approach. The study proposes a multi-functional port framework that supports more efficient, sustainable, and inclusive port development, especially for maritime countries like Indonesia.

METHOD

This study uses a Systematic Literature Review, or SLR, based on the PRISMA framework. Data were collected from Scopus, Web of Science, and Google Scholar using keywords related to port-centric infrastructure, passenger services, cargo logistics, industrial areas, and fisheries activities.
From 78 initial articles, only 5 eligible studies were selected after the identification, screening, eligibility, and inclusion stages. The selected studies were then analyzed thematically to identify integration patterns, challenges, and opportunities in developing multifunctional port systems.

RESULT



This PRISMA flow diagram illustrates the article selection process used in this study. Initially, 78 articles were identified from Scopus, Web of Science, and Google Scholar databases. After removing 20 duplicate records, 58 articles remained for the screening stage.

During title and abstract screening, 38 articles were excluded because they were irrelevant to integrated port services or did not meet the academic criteria. The remaining 20 full-text articles were then assessed for eligibility. After further evaluation, 15 articles were excluded due to limited discussion on port integration or unclear methodology.

Finally, 5 eligible studies were included in the final synthesis and analyzed to understand the integration of passenger services, cargo logistics, industrial activities, and fisheries within the port-centric framework.

RESULT

Author and Year	Title	Research Results
Ginting, E. R. P., Rachmadani, A. I., Maulana, S., Riandika, S., & Ma'ruf (2024)	Strategies to Improve Competitiveness at Nusantara 1 and 2 Passenger Terminals through Enhanced Service Facilities	The increase in the competitiveness of the Nusantara 1 and 2 passenger terminals is greatly influenced by the quality of facilities (comfort of the waiting room, cleanliness, security) and the smooth flow of passengers. The recommended strategies include increasing the capacity of waiting facilities, installing digital information systems, and integrating technology-based passenger services to reduce waiting times and increase user satisfaction.
Akan, E., & Durmaz, V. (2024)	Value-Added Services from a Port Centric Logistics Perspective: A Literature Review	This literature review identifies that value-added services in port areas—such as warehousing, labeling, repackaging, quality control, and customs—are at the heart of port-centric logistics. These services are able to improve supply chain efficiency, reduce logistics costs, and strengthen the port's role as a center of value creation, not just a transshipment point.
Dui, H., Zheng, Y., & Yan, Z. (2023)	Interdependency patterns of potential seaport risk factors in relation to supply chain disruption in Indonesia	The study found that port risk factors in Indonesia, such as congestion, infrastructure limitations, and regulatory uncertainty, are interdependent and have the potential to trigger widespread supply chain disruptions. This pattern of interdependence is modeled in a risk network to help formulate more systemic and non-partisan mitigations.
Muhibuddin, A., Santoso, S., Widodo, S., & Tukiman (2025)	Exploring the Relationship Between Industrial Zones and Integrated Ports in Promoting Regional Development Sustainability in Sorong Regency, Indonesia	Industrial estates integrated with ports in Sorong have proven to be a driver of sustainable regional development through increased investment, logistics efficiency, and absorption of local labor. However, there are still obstacles in the form of inequality in infrastructure readiness and the need to align spatial planning policies between the central and regional governments.
Firmandhani, S. W., & Riza, M. A. A. (2018)	Causal Factors in Resilience of Old Tambak Lorok Fishing Port in Semarang	The resilience of the traditional fishing port of Tambak Lorok rests on three causal factors: the robustness of the physical infrastructure (piers, auction facilities), the strength of fishermen's social networks, and the adaptive capacity of the auction system to seasonal and price fluctuations. The sustainability of the function of the Fish Auction Place is highly dependent on management that combines physical improvements with institutional strengthening of the fishing community.

The final synthesis included 5 selected articles representing the four main pillars of port-centric infrastructure.

The first article discusses passenger services, emphasizing that improving terminal facilities, digital information systems, and passenger flow management can increase service quality and user satisfaction.

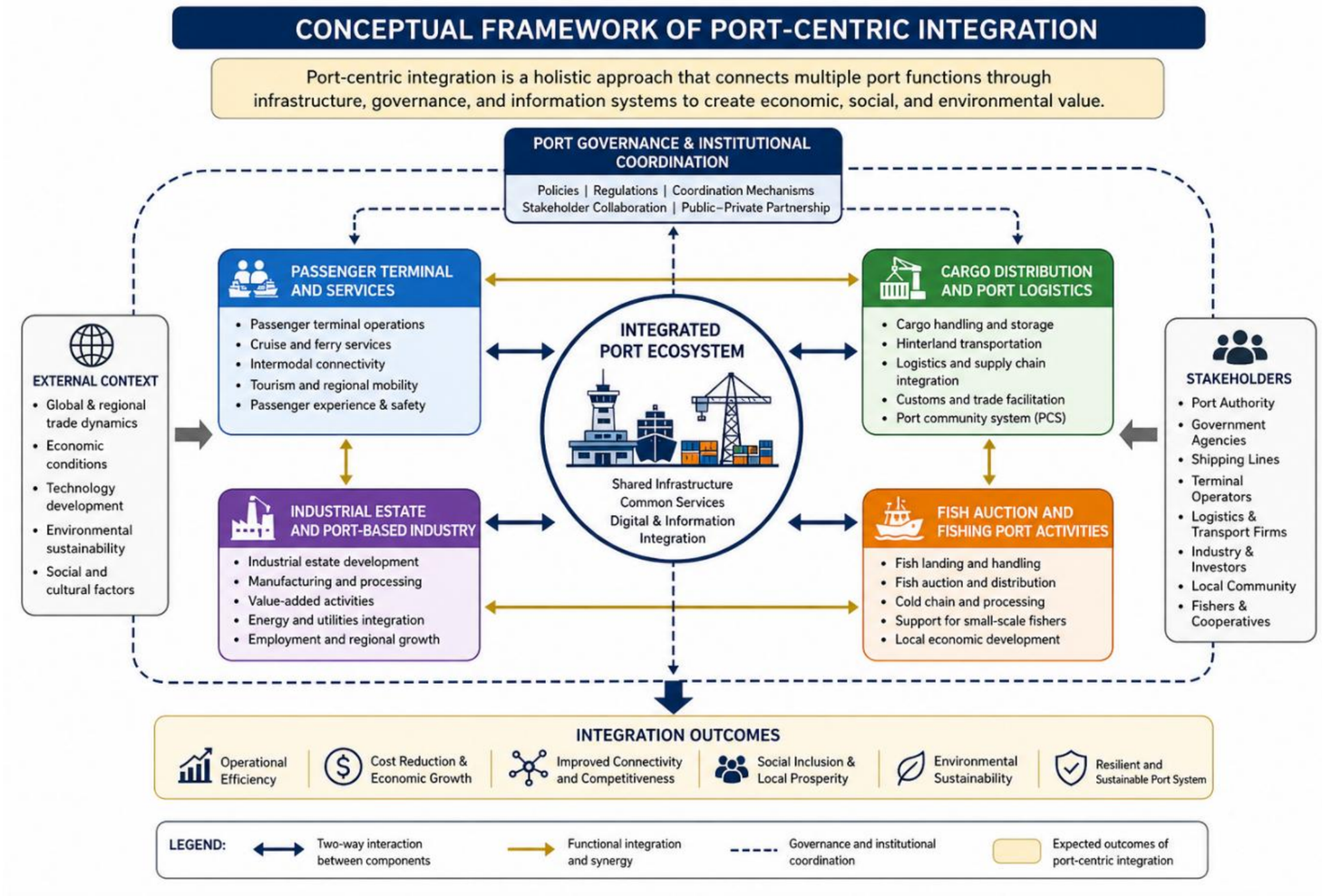
The second and fifth articles focus on cargo logistics and supply chain management. The findings show that port-centric logistics, supported by warehousing and value-added services, can improve logistics efficiency and reduce distribution costs. However, Indonesian ports still face risks such as congestion, infrastructure limitations, and supply chain disruptions.

The third article highlights industrial integration, showing that integrated ports and industrial zones can support regional economic growth, increase investment, and create employment opportunities, although infrastructure readiness and policy coordination remain major challenges.

Meanwhile, the fourth article discusses fisheries activities, particularly fish auction facilities, where the sustainability of fishing ports depends on infrastructure quality, institutional support, and the adaptive capacity of fishing communities.

Overall, these five studies indicate that integrated port systems can improve economic performance and sustainability, but current research and implementation are still fragmented and not yet fully holistic.

RESULT



This conceptual framework illustrates that port-centric integration is a holistic system that connects four main port functions: passenger services, cargo logistics, industrial activities, and fisheries operations within one integrated port ecosystem.

At the center of the framework is the integrated port ecosystem, supported by shared infrastructure, common services, digital systems, and information integration. The framework also emphasizes the importance of governance and institutional coordination through policies, stakeholder collaboration, and public-private partnerships.

The model shows that all port sectors are interconnected and influenced by external factors such as economic conditions, technology, sustainability, and global trade dynamics. Through this integration, ports are expected to achieve operational efficiency, lower logistics costs, stronger regional competitiveness, social inclusion, environmental sustainability, and a more resilient port system.

CONLUSION

This study systematically reviews the integration of passenger services, cargo logistics, industrial activities, and fisheries within port-centric infrastructure. The findings show that existing research is still fragmented, mainly focusing on cargo logistics and industrial integration, while passenger and fisheries services remain underexplored. This indicates that port systems are not yet fully understood as multifunctional and interconnected ecosystems.

The novelty of this study lies in proposing a multi-pillar port-centric framework that integrates logistics, industry, passenger services, and fisheries within a unified system supported by shared infrastructure, governance, and information integration. This approach expands the theoretical understanding of port-centric development and provides a more holistic perspective on port systems.

Practically, the study offers strategic insights for policymakers and port authorities to strengthen integrated planning, improve cross-sectoral coordination, and support sustainable regional development. However, this study is limited by the small number of selected articles and database coverage. Therefore, future research is recommended to apply quantitative and empirical approaches to further validate the proposed framework and explore governance mechanisms supporting effective port integration.

ABSTRACT

Port-centric infrastructure plays a strategic role in integrating multiple port services, including passenger transport, cargo distribution, industrial activities, and fisheries-based operations such as fish auctions; however, existing studies often examine these functions in isolation, leading to a fragmented understanding of port systems. This study aims to systematically assess the role of port-centric infrastructure in enabling integrated port services using a Systematic Literature Review (SLR) approach. Data were collected from Scopus, Web of Science, and Google Scholar, yielding 78 initial records, of which five articles were selected after a rigorous screening and eligibility process. The findings indicate that current research is dominated by cargo logistics and industrial integration, while passenger services and fisheries-related activities remain underexplored, reflecting an incomplete representation of ports as multi-functional systems, particularly in developing maritime contexts. The novelty of this study lies in proposing a multi-pillar perspective that integrates passenger, logistics, industrial, and fisheries functions within a unified port-centric framework. This research contributes theoretically by advancing a more holistic conceptualization of port systems and practically by offering insights for policymakers and port authorities to strengthen cross-sectoral integration, while future research should focus on empirical validation and governance mechanisms supporting integrated port development.

Keywords : port-centric infrastructure, integrated port services, cargo logistics, industrial integration, fisheries activities.

Thank You
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Presentation 2026

Role of Port - Centric Infrastructure in Passenger, Cargo, Industry, and Fisheries Services

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ABSTRACT

Port-centric infrastructure plays a strategic role in integrating multiple port services, including passenger transport, cargo distribution, industrial activities, and fisheries-based operations such as fish auctions; however, existing studies often examine these functions in isolation, leading to a fragmented understanding of port systems. This study aims to systematically assess the role of port-centric infrastructure in enabling integrated port services using a Systematic Literature Review (SLR) approach. Data were collected from Scopus, Web of Science, and Google Scholar, yielding 78 initial records, of which five articles were selected after a rigorous screening and eligibility process. The findings indicate that current research is dominated by cargo logistics and industrial integration, while passenger services and fisheries-related activities remain underexplored, reflecting an incomplete representation of ports as multi-functional systems, particularly in developing maritime contexts. The novelty of this study lies in proposing a multi-pillar perspective that integrates passenger, logistics, industrial, and fisheries functions within a unified port-centric framework. This research contributes theoretically by advancing a more holistic conceptualization of port systems and practically by offering insights for policymakers and port authorities to strengthen cross-sectoral integration, while future research should focus on empirical validation and governance mechanisms supporting integrated port development.

Keywords **:** port-centric infrastructure, integrated port services, cargo logistics, industrial integration, fisheries activities.

Introduction

Indonesia, as the largest archipelagic country in the world, places ports in a strategic position as the lifeblood of connectivity and the driver of the national economy. More than just a transportation node, ports in the modern era are required to transform into an integrated port-centric infrastructure , which is a port that not only serves loading and unloading, but also becomes a center for logistics, industry, and service activities in an integrated manner. This concept is relevant to Indonesia's geographical conditions which demand supply chain efficiency and equitable distribution of development through sea tolls as well as strengthening maritime economic nodes. Third-generation and later ports become international logistics centers tightly linked with intermodal transport and global trade (Belmoukari et al., 2023; Garrido Salsas et al., 2022a; Md Ibrahim & Wang Xuefeng, 2023). In this context, ports should ideally be able to accommodate the four main service pillars simultaneously: passenger services, distribution of goods, development of industrial estates, and people's economic

empowerment through fish auction sites (TPI) for fishermen (Andi Mappiasse et al., 2024; Muhammad Aris et al., 2024; Nurfadillah et al., 2022).

The reality on the ground shows that these four functions are still often running partially. Passenger ports such as Tanjung Priok or Tanjung Perak often operate with a focus on people's mobility without strong synergy with the surrounding industrial estates. On the other hand, fishing ports with their TPIs, such as those at the Nizam Zachman Ocean Fishing Port, face the classic challenge of lack of integration with cold chain logistics systems and limited market access. This fragmentation results in high national logistics cost inefficiencies, suboptimal use of port assets, and loss of potential economic added value that can be generated from an integrated port ecosystem. A multifunctional port management model is needed that is able to respond to the needs of the *port-centric era*, where passenger, cargo, industrial, and fisheries services are managed in one integrative vision (Garrido Salsas et al., 2022b; Gerlitz & Meyer, 2021).

Academic studies on the role of ports have been widely conducted, but they are generally fragmented in one particular dimension. A number of researches only delve into *the port-centric logistics aspect* that focuses on the efficiency of goods distribution and warehousing integration. Another study examines the role of ports in the development of coastal industrial areas without mentioning the socio-economic dimension of fishermen. Meanwhile, the literature on TPI mostly discusses aspects of capture fisheries and cold chain management, regardless of the broader context of commercial port infrastructure. The *research gap* identified is the absence of a literature review that holistically synthesizes the four roles in an integrated *port-centric framework* , especially in the context of archipelagic countries such as Indonesia**.** In fact, the integration of these four functions is crucial to realize the port as a catalyst for inclusive regional economic growth.

To build a solid theoretical foundation, this research refers to several foundations. First, *the port-centric logistics* theory which emphasizes that ports should be the center of added value creation through the placement of logistics and manufacturing activities in or around the port area. Second, the *maritime economic node* approach which views ports as economic clusters that combine the functions of transportation, trade, and industrial services. Third, to accommodate the function of public services and community empowerment, the concept of *ports as community builders* is used which emphasizes the social responsibility of the port to the surrounding community, including small fishermen. The combination of these three perspectives is needed to analyze the complexity of the role *of port-centric* infrastructure that is not only business-oriented, but also public services.

Methodologically, this article uses a systematic literature *review approach*. This method was chosen to identify, evaluate, and synthesize the findings of previous research in a structured and transparent manner, following the PRISMA (*Preferred Reporting Items for Systematic Reviews and Meta-Analyses*) guidelines adapted for the social and engineering fields. The literature search focused on reputable journal articles, conference proceedings, and policy reports published in the span of the past decade, using keywords related to *port-centric*, passenger ports, port logistics, port industrial estates, and fish auction sites. The synthesis process will be directed to map the extent to which the integration of the four service pillars has been studied, as well as identify potential determinants, barriers, and integration models.

The expected contribution from the writing of this article is multidimensional. Academically, this study provides a comprehensive literature map that bridges the fragmentation of research on ports, while offering a new conceptual framework on *port-centric multifunctional ports*. Practically, this synthesis can be a reference for policy makers at the Ministry of Transportation, the Ministry of Maritime Affairs and Fisheries, as well as port operators in designing integrated port development that is able to become a center for passenger services, a driver of national logistics, the core of industrial estates, and a fair market for fishermen's catches.

Research Method

This study uses a systematic literature review approach that refers to the PRISMA protocol to ensure transparency and accuracy in each stage. The search strategy is applied to reputable academic databases such as Scopus, Web of Science, and Google Scholar. The keywords are structured by, combining the terms "port centric" and "integrated port" with "passenger terminal", "cargo distribution", "industrial park", as well as "fish auction" and "fishing port". The search focused on English and Indonesian articles published in the range of 2021 to 2024, plus policy reports and port authority documents as complementary sources to enrich the Indonesian context.

Once the search results are collected, strict inclusion and exclusion criteria are set. Articles included are journals, conference proceedings, or book chapters that discuss one or more pillars of port services in the framework of port centric or port integration, both from the technical, managerial, social, and economic aspects, especially those that can be analogous to the condition of archipelagic countries such as Indonesia. Meanwhile, articles that only highlight aspects of navigation or shipping safety unrelated to the integration of land-based services, as well as non-scientific publications without a clear methodology, were excluded from the review.

The selection procedure is carried out in four main stages according to the PRISMA flow. The identification stage collects and deduplicates all search results with reference management software. Next, the screening stage independently assesses the title and abstract by two researchers to weed out irrelevant articles. Articles that pass the screening are then downloaded in full text and assessed for eligibility based on inclusion-exclusion criteria, with each reason for exclusion transparently recorded. Only articles that were declared viable were included in the final synthesis, and this entire process was documented in the PRISMA flowchart.

Data from each included article was systematically extracted, including authors, year, geographic context, research methods, service pillar focus, key findings, as well as port-centric integration indicators discussed. The analysis was carried out with a thematic approach, identifying major themes such as port function integration models, determinants and obstacles to the implementation of multifunctional centric ports, impacts on logistics efficiency and the welfare of the surrounding community, as well as the typical characteristics of archipelagic countries that influence the success of the concept. The synthesis process is structured narratively by stringing together the linkages between studies, as well as mapping unfilled research gaps, then associated with port-centric logistics theory, maritime economy nodes, and ports as community builders as a conceptual framework.

To maintain the validity of the findings, the entire screening and extraction process is carried out by two independent reviewers. Differences in assessment are resolved through discussion until consensus is reached. The quality of each study was also assessed using the Critical Appraisal Skills Programme instrument for qualitative research as well as a tailored checklist for quantitative and blended studies. With this rigorous and structured stage, the literature review is expected to be able to produce a holistic picture of the extent to which the integration of the four pillars of port services has been studied, as well as reveal the opportunities and challenges of integrated port-centric port development in Indonesia.

Results and Discussion

A systematic search was conducted on three databases, namely Scopus, Web of Science (WoS), and Google Scholar, using a combination of structured keywords: ("port centric" OR "port-centric logistics" OR "integrated port") AND ("passenger terminal" OR "passenger service") AND ("cargo distribution" OR "port logistics") AND ("industrial estate" OR "port industry") AND ("fish auction" OR "fishing port"). The entire search resulted in a total of 78 articles which then went through four stages of selection.

At the identification stage, after the articles were collected and deduplicated using reference management software, there were 58 unique articles left. The screening stage was carried out by reviewing the titles and abstracts by two independent researchers; a total of 38 articles were excluded because they were irrelevant, among others because they only discussed shipping navigation without the integration of land services, or in the form of non-scientific opinions and publications.

Furthermore, 20 potential articles were downloaded in full text to be assessed for eligibility based on the inclusion-exclusion criteria. The article should address at least one of the four pillars of port services within the framework of port centric or port integration, both from a technical, managerial, social, and economic perspective. At this feasibility stage , 15 articles were excluded for various reasons, for example not including an analysis of the integration of port functions or using an unclear methodology.

The final stage is inclusion, where 5 articles are declared eligible and go into the final synthesis. The five articles represent the four pillars proportionally:

1. Passenger Pillar – an article that examines the improvement of passenger terminal facilities in Tanjung Priok.
2. Pillar of Goods – a literature review article that maps value-added logistics services from a port-centric perspective.
3. Industrial Estate Pillar – an article that analyzes the relationship between industrial estates and integrated ports in promoting the sustainability of regional development in Sorong.
4. Pilar Fish Auction Place – an article that examines the factors of the resilience of the old fishing port in Tambak Lorok, Semarang.
5. The fifth article supports the goods pillar from the perspective of port-based supply chain risk in Indonesia, enriching the risk management dimension of goods distribution.

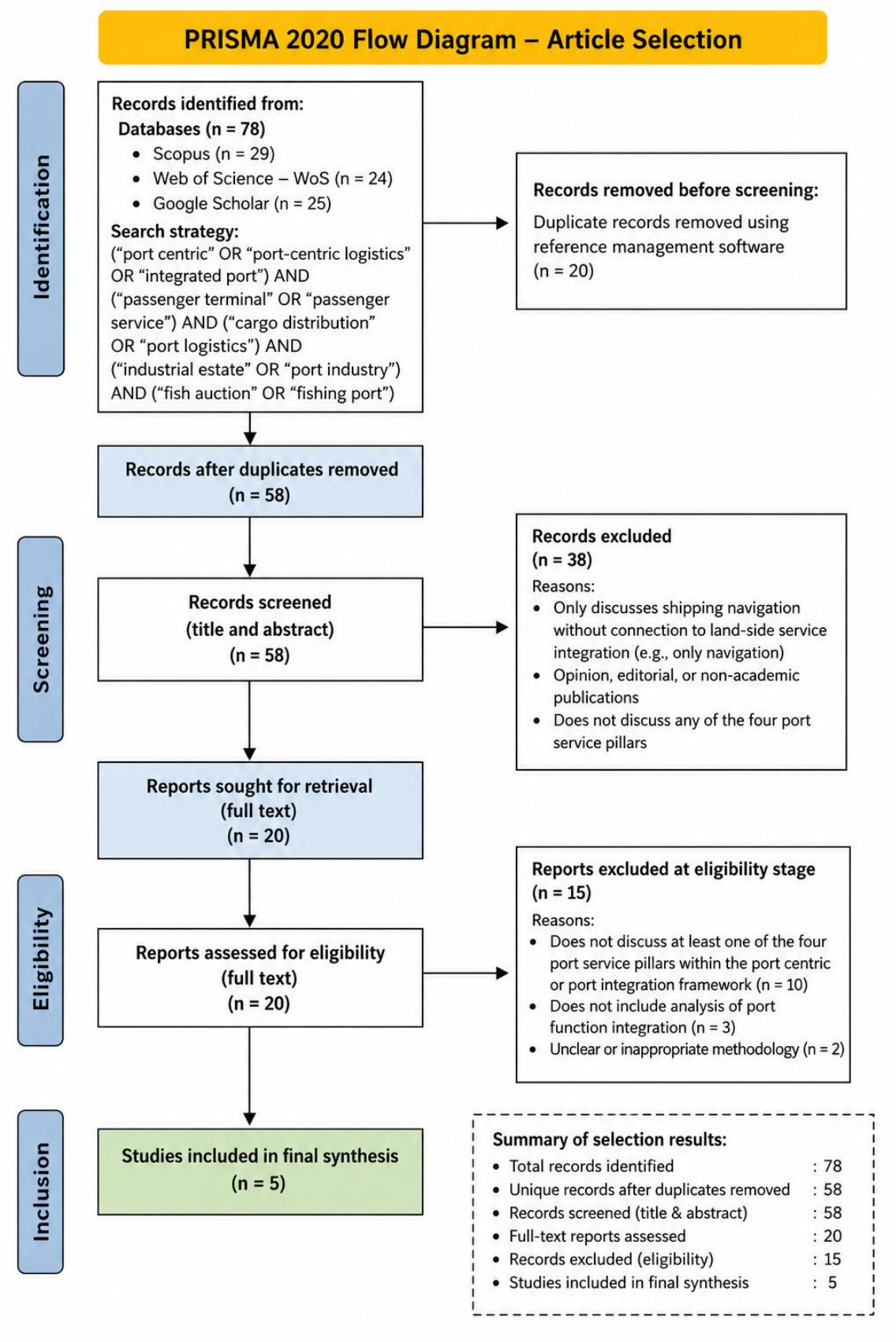

Figure 1. PRISMA diagram

Table 1. literature review

Author and Year	Title	Research Results
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Firmandhani, S. W., & Riza, M. A. A. (2018)	Causal Factors in Resilience of Old Tambak Lorok Fishing Port in Semarang	The resilience of the traditional fishing port of Tambak Lorok rests on three causal factors: the robustness of the physical infrastructure (piers, auction facilities), the strength of fishermen's social networks, and the adaptive capacity of the auction system to seasonal and price fluctuations. The sustainability of the function of the Fish Auction Place is highly dependent on management that combines physical improvements with institutional strengthening of the fishing community.

The systematic review resulted in five eligible studies that met the predefined inclusion criteria. Although the number of selected articles is relatively limited, the findings provide a focused and meaningful understanding of port-centric integration within port systems. The reviewed studies indicate that this research area is still emerging, as reflected by the relatively recent publication trends and the limited number of comprehensive studies addressing integrated port functions. Geographically, the studies are largely situated in regions where ports play a strategic role in economic development, particularly in maritime-oriented and developing economies.

From a methodological perspective, the existing literature is dominated by qualitative and conceptual approaches, with relatively few studies employing quantitative analysis or empirical modeling. This suggests that the development of port-centric integration is still largely exploratory, with scholars primarily attempting to conceptualize and define the relationships between different port functions rather than rigorously testing them. As a result, there is still significant room for strengthening the empirical foundation of this field.

The thematic synthesis reveals that the literature can be broadly categorized into four main components of port services, namely passenger services, cargo logistics, industrial integration, and fisheries-related activities. Among these, cargo distribution and port logistics receive the greatest attention, with most studies emphasizing the importance of integrating port operations with hinterland transportation systems. This integration is widely recognized as a key factor in improving efficiency, reducing congestion, and enhancing supply chain performance. In contrast, passenger services tend to be treated as a separate domain, with limited efforts to integrate them into the broader port-centric framework. This separation may reduce the overall effectiveness of port systems, particularly in multifunctional ports where passenger and cargo activities coexist.

Industrial integration is also identified as a critical element of port-centric development, as ports increasingly function as hubs for industrial and value-added activities. The reviewed studies highlight the potential of ports to support manufacturing, processing, and logistics-based industries through spatial and functional integration. However, the level of integration varies significantly across cases, and in many instances, the connection between port operations and industrial estates remains underdeveloped. Meanwhile, fisheries-related activities, including fish auctions and fishing ports, receive minimal attention in the literature. Despite their importance for local economies, these activities are rarely incorporated into port-centric models, indicating a clear gap in aligning traditional maritime sectors with modern logistics systems.

A comparative analysis of the selected studies reveals both convergence and divergence in findings. While there is general agreement on the importance of cargo logistics and industrial integration, notable differences emerge in how other port functions are conceptualized and integrated. These variations can be attributed to differences in port typology, regional priorities, and institutional arrangements. In addition, the absence of a standardized framework for port integration leads to inconsistent interpretations across studies, with some adopting a logistics-oriented perspective and others emphasizing spatial or economic dimensions.

The review also identifies several important research gaps that warrant further investigation. Existing studies tend to focus on specific components of port services rather than adopting a holistic approach that integrates all major functions. Fisheries-related activities, in particular, are significantly underrepresented, despite their relevance in many coastal regions. Furthermore, there is a lack of robust empirical evidence to support existing conceptual models, as many studies rely on qualitative assessments without sufficient data-driven validation. The limited number of studies conducted in developing countries further highlights the need for more context-specific research, especially in regions where ports serve multiple economic and social functions.

From a theoretical standpoint, this review contributes to the advancement of port-centric concepts by expanding their scope beyond traditional cargo logistics. The findings suggest that ports should be understood as multi-functional systems in which various services are interconnected and mutually reinforcing. This perspective calls for a more integrated conceptual framework that captures the complexity of port operations, including the interactions between logistics, industry, passenger services, and local economic activities.

In terms of practical implications, the results highlight the need for more integrated planning and governance in port development. Policymakers and port authorities should prioritize the alignment of port operations with hinterland logistics, strengthen the linkages between ports and industrial zones, and incorporate traditional sectors such as fisheries into modern port systems. Such integration is particularly relevant for countries like Indonesia, where ports often serve multiple roles and have the potential to act as catalysts for regional development.

Based on the synthesis, this study proposes a conceptual understanding of port-centric integration as a system composed of interconnected service pillars, including passenger services, cargo logistics, industrial activities, and fisheries. These components are linked through shared infrastructure, coordinated governance, and integrated information systems, forming a unified port ecosystem that enhances overall performance and sustainability.

Despite its contributions, this study has several limitations. The relatively small number of included articles may limit the generalizability of the findings, and the reliance on selected databases may have excluded relevant studies from other sources. In addition, the focus on published literature introduces the possibility of publication bias. Future research is therefore encouraged to expand the scope of data sources, apply quantitative methods to assess integration performance, and explore empirical case studies in diverse geographical contexts. Particular attention should be given to the integration of fisheries and other underrepresented sectors, as well as to the role of governance and institutional frameworks in shaping port-centric development.

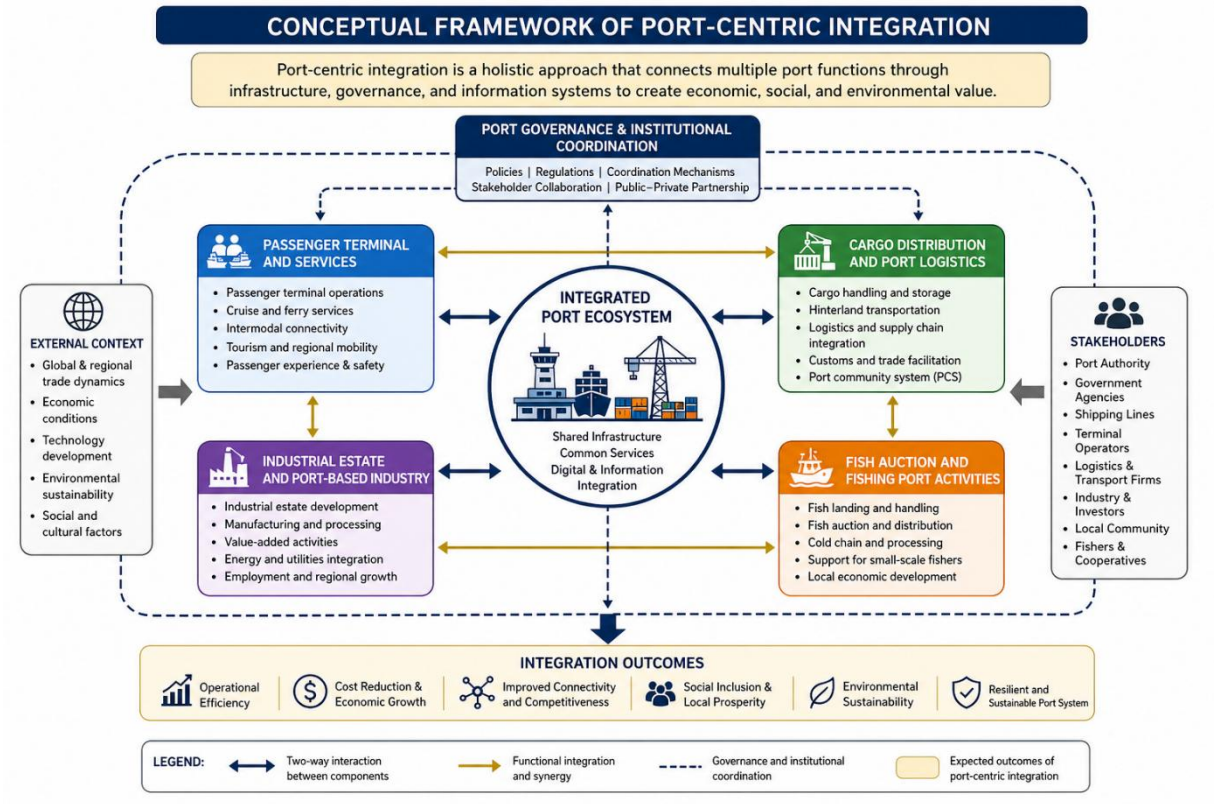

Figure 2. ***Port Integration Concept***

Conclusion

The conclusion must be narrated concisely, clearly, and in relation to the research findings. The conclusion also explains the novelty of the findings and the implications of the research.

This study provides a systematic synthesis of the existing literature on port-centric integration by examining the interconnection between key port service functions, namely passenger services, cargo logistics, industrial activities, and fisheries-related operations. The findings reveal that current research remains largely fragmented, with a predominant focus on cargo logistics and industrial integration, while other essential components—particularly fisheries and passenger services—are still underexplored. This indicates that the prevailing understanding of port-centric systems is not yet fully holistic and tends to overlook the multi-functional nature of ports, especially in developing maritime contexts.

The novelty of this research lies in its integrative perspective, which reconceptualizes port-centric development as a multi-pillar system that simultaneously incorporates logistics, industrial, passenger, and fisheries functions within a unified framework. Unlike prior studies that emphasize partial or sectoral integration, this study advances a more comprehensive approach by positioning ports as interconnected ecosystems supported by shared infrastructure, governance mechanisms, and information systems. This expanded perspective contributes to the theoretical enrichment of port-centric concepts and offers a more inclusive foundation for analysing complex port environments.

The implications of this research are both theoretical and practical. Theoretically, the study broadens the scope of port-centric integration by introducing a multi-dimensional framework that captures the interdependencies among diverse port functions. Practically, the findings provide strategic insights for policymakers, port authorities, and industry stakeholders to promote integrated planning, strengthen cross-sectoral linkages, and incorporate traditionally overlooked sectors such as fisheries into modern port systems. Such integration is particularly relevant for countries with multifunctional ports, where optimizing synergies across sectors can significantly enhance economic efficiency, regional development, and sustainability.

Despite its contributions, this study acknowledges several limitations, including the relatively small number of selected articles and the reliance on specific databases, which may limit the comprehensiveness of the review. Therefore, future research is encouraged to expand the literature base, employ quantitative and mixed-method approaches, and conduct empirical case studies to validate and refine the proposed framework. Further investigation into governance structures, institutional coordination, and stakeholder dynamics is also essential to better understand the mechanisms that enable effective port integration. Additionally, exploring the integration of fisheries and other local economic activities into port-centric systems remains a promising direction for advancing both research and practice in this field.

References

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