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Analysis of the Implementation of the Port Concession between KSOP Class I Sorong and PT Pelindo Regional 4 Sorong

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***Abstract*—** This research aims to analyze the implementation of concession policies at Sorong Port based on Government Regulation Number 31 of 2021 and Minister of Transportation Regulation Number 48 of 2021, focusing on the role of the Sorong Class I Port Authority Office (KSOP), PT Pelindo Regional 4 Sorong, and port workers. This study uses a qualitative approach with data collection techniques through interviews and field observations. The results of the study show that the implementation of concessions has provided clarity on the role between regulators and operators, but the implementation has not been optimal because there is still a gap between administrative policies and operational realization in the field. The limitations of technological infrastructure, human resource capacity, and differences in orientation between KSOP and Pelindo are the main inhibiting factors. Nevertheless, concessions have a positive impact on improving service efficiency, operational order, and the implementation of safety standards. Obstacles such as the absence of uniform Standard Operating Procedures (SOPs) and limited port facilities indicate the need for an adaptive approach that takes into account the local characteristics of the eastern region of Indonesia. This study concludes that the success of concessions at Sorong Port depends on policy harmonization, institutional coordination, and strengthening the capacity of human resources. With the support of central government policies and synergy between regulators, operators, and labor, Sorong Port has the potential to become an efficient, modern, and sustainable integrated port management model in eastern Indonesia.

Keywords—port concessions, KSOP Sorong, Pelindo, Eastern Indonesia.

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I. INTRODUCTION

Ports are a vital node in the sea transportation system that plays a major role in facilitating the flow of logistics, trade, and human mobility in Indonesia as an archipelagic country. The port serves as a distribution center for goods, supporting economic growth, and strengthening connectivity between islands.[1], [2], [3]

As the backbone of sea transportation, the efficient performance of ports is a major factor in driving national economic growth and increasing global competitiveness. Port logistics efficiency greatly determines economic competitiveness, especially in the eastern region of Indonesia which still faces high logistics costs due to local port inefficiency [3] . Improving port efficiency plays an important role in smoothing the flow of goods, lowering shipping costs, and encouraging export-import activities [4], [5], [6]. In addition, port efficiency also contributes to an increase in foreign direct investment (FDI) and strengthens the country's position in the global supply chain [4], [5]. Cross-border studies show that improved port efficiency is able to lower logistics costs by up to 12% and significantly increase trade volumes [6]

Nonetheless, improving port efficiency depends not only on economic factors, but also on the port's role as a node for national transportation and logistics integration. The port not only serves as a docking and loading and unloading of goods, but also as a strategic center that integrates various marine transportation and logistics functions to support national economic development, inclusivity, and regional connectivity in Indonesia as an archipelagic country [7], [8], [9], [10], [11], [12]. However, port management in Indonesia still faces a number of challenges, including limited infrastructure, operational inefficiencies, and suboptimal involvement of the private sector in port development and management. Many ports in Indonesia do not have adequate facilities and technology, thus hindering the smooth flow of goods and reducing logistics performance [13], [14], [15]. Infrastructure investment is also still limited, especially in the eastern region and small ports [3], [15].

This condition shows that the port problem in Indonesia is not only technical, but also structural. Complicated bureaucratic processes, overlapping regulations, and corrupt practices slow down port services. High dwelling time, inter-stakeholder conflicts, and lack of integration of data and systems are classic problems that have not been solved [13], [16], [17], [18]. The use of modern technologies such as digitalization, artificial intelligence, and blockchain is also still limited, while the quality of human resources is not even across ports [14], [19], [20]. These conditions cause port services to be less responsive and inefficient

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[13], [19].

Limited governance and infrastructure also have an impact on the low participation of the private sector in port development. Private involvement is still focused on specific terminals and has not been evenly distributed throughout Indonesia [17], [21]. The main obstacles include rigid regulations, the dominance of SOEs, and a lack of investment incentives [17], [18], [21]. The lack of private role results in limited innovation, limited capital, and slow adoption of new technologies [13], [18], [22].

In response to these problems, the government seeks to strengthen the legal basis and policies of the port sector through various strategic regulations. Law Number 17 of 2008 concerning Shipping is the main legal basis which is strengthened by Government Regulation Number 31 of 2021 concerning the Implementation of the Shipping Sector and Regulation of the Minister of Transportation Number 48 of 2021 concerning Concessions and Cooperation between Port Operators and Port Business Entities. This regulation opens up opportunities for the government-private cooperation model through concession schemes, management contracts, rentals, and operational cooperation. Thus, private participation is increasingly encouraged to increase investment, efficiency, and professionalism of port governance.

The implementation of this policy is becoming increasingly important for ports in the eastern region of Indonesia which have a strategic role in supporting national connectivity. Sorong Port is one of the main logistics nodes in the eastern region that has a strategic position on the Asia-Australia international shipping route, as well as part of the Sea Toll program. The increase in cargo and passenger flows in recent years shows the great potential of this port to be developed as a regional logistics hub. However, the implementation of concession policies and port cooperation at Sorong Port still faces obstacles from regulatory aspects, coordination between stakeholders, to the readiness of infrastructure and human resources.

In this context, the government-private cooperation scheme or Public-Private Partnership (PPP) is an alternative that is considered effective in accelerating port development. This scheme is recognized as a solution to overcome the limitations of the State Budget and accelerate the development of strategic infrastructure [23], [24], [25], [26]. Existing regulations allow various forms of cooperation such as concessions, management contracts, rentals, and operational cooperation that can be adjusted to the characteristics of regional ports, including Sorong [24], [26], [27]. The government also provides legal guarantees and certainty for private investors, including protection against the risk of regulatory changes, delays in licensing, and certainty of investment returns [24], [27].

However, the effectiveness of the implementation of regulations and cooperation at Sorong Port still faces a number of challenges. Concession regulations and port cooperation have not been fully able to answer the problems of coordination between parties, limited infrastructure, and the readiness of human resources in the field. However, until now, there have not been many comprehensive studies that specifically examine the implementation of concessions at Sorong Port involving the roles of three main actors, namely KSOP as a regulator, PT Pelindo IV as an operator, and port workers as direct actors in the field. The absence of such studies creates a knowledge gap on the extent to which concessions are truly able to improve efficiency, transparency, and welfare in the port sector. Therefore, this research is important to answer the vacancy as well as provide recommendations for optimizing the management of Sorong Port.

II. METHOD

This study uses a descriptive-qualitative approach with a case study method that focuses on Write the implementation of concessions at Sorong Port. The selection of this approach is based on the purpose of the research to gain an in-depth understanding of the dynamics of the implementation of concession regulations, especially the interaction between the Sorong Class I Port Authority Office and Authority (KSOP), PT Pelindo Persero IV Sorong, and port workers. The case study method allows researchers to examine phenomena in real context in detail, so as to provide a complete picture of concession practices and the challenges that come with them.

The main source of data for this study comes from primary data collected through interviews and field observations. Interviews were conducted in depth with three groups of respondents, namely KSOP Sorong officials, the management of PT Pelindo IV Sorong, and port workers. Through this interview, the researcher seeks to explore information related to the implementation of concessions, coordination mechanisms between parties, obstacles that arise in operations, and the impact of policies on the efficiency and welfare of workers. Field observations were carried out directly at Sorong Port with the aim of observing the condition of the infrastructure, the loading and unloading operational process, and daily interaction between the organizers, managers, and workers.

In addition to primary data, this study also pays attention to secondary data as a complement, such as regulatory documents (Government Regulation No. 31 of 2021 and PM No. 48 of 2021), performance reports of Sorong Port, and relevant publications. Secondary data is used to strengthen findings from the field while providing factual context regarding national and regional port conditions.

The collected data was then analyzed using thematic analysis. The analysis process was carried out through the stages of coding, categorization, and identification of the main themes that emerged from the results of interviews and observations. This analysis focuses on three main aspects: the implementation of concession regulations, obstacles faced by KSOP, Pelindo, and labor, as well as improvement opportunities that can support the optimization of Sorong Port management. With this approach, the research is expected to produce findings that are not only descriptive, but also make a

practical contribution to improving the governance of port concessions.

III. Results and Discussion

A. Implementation of Concession Regulations at Sorong Port

The implementation of the concession policy at Sorong Port is a form of separation of roles between regulators and operators as mandated in Law Number 17 of 2008 concerning Shipping. KSOP Class I Sorong acts as a regulator, shipping safety supervisor, and concession rights provider, while PT Pelindo Regional 4 Sorong acts as a Port Business Entity (BUP) that manages and operates port services based on concession agreements.

The concession implementation process includes the granting of concession rights by KSOP, the preparation of agreements that include the term, scope of activities, rights and obligations, and compensation schemes in the form of revenue deposits to the state. After the agreement is signed, Pelindo carries out operational activities, while KSOP conducts periodic supervision and evaluation. Observations show that the synergy between the two parties has increased service efficiency, but the implementation of digitalization systems such as Inaportnet and Phinisi has not been optimal due to limited technology infrastructure and human resources.

B. Coordination between KSOP and PT Pelindo IV Sorong

Interview and field observation activities were carried out directly at the Sorong Class I Port Authority Office and at the Office of PT Pelindo Regional 4 Sorong. In this activity, the researcher conducted an in-depth discussion with the Head of KSOP and the Chairman of PT Pelindo IV Sorong regarding the implementation of concession regulations, operational coordination, and challenges in the implementation of the port digitalization system.

Figure 1. The researcher met with the Head of KSOP Class I Sorong (left) and the Head of PT Pelindo Regional 4 Sorong (right) in interview and field observation activities.

The results of interviews and field observations show that the working relationship between KSOP and PT Pelindo IV Sorong is collaborative but still faces coordination challenges. Both have the same vision of improving operational efficiency, but differences in focus often lead to differences in priorities. KSOP focuses on safety and regulatory compliance, while Pelindo is oriented towards business efficiency and improving user service.

Coordination obstacles arise when there is an overlap of authority, such as in setting tariffs or licensing operational activities. To overcome this, the two parties formed a regular coordination forum through monthly meetings (coklit) to harmonize policies and implementation in the field. This forum is considered effective in clarifying the division of roles, accelerating decision-making, and reducing potential friction between institutions.

C. Impact of Concessions on Port Operations

The implementation of the concession has a positive impact on the port's operational performance. Based on the results of interviews with Pelindo, the implementation of concessions encourages service standardization and the use of digital systems to monitor operational performance periodically. Some port equipment such as cranes and warehouses have undergone repairs, and ship waiting times have decreased although not significant. However, the capacity of the dock and loading and unloading equipment is still limited so that it has not been able to keep up with the increase in the flow of goods and ships. These constraints are compounded by the need for ongoing infrastructure maintenance and complex project licensing procedures. Thus, although concessions have improved operational efficiency, their effectiveness still depends on strengthening infrastructure and accelerating investment bureaucracy.

D. The Impact of Concessions on Port Labor

For port workers, the implementation of concessions provides positive changes, especially in terms of regularity of work schedules and improvement of safety standards. Workers admit that the loading and unloading process is now more coordinated and better monitored. However, in terms of welfare, the changes felt have not been significant. Most of the workforce is still contract with stagnant incomes, while job demands increase as facilities modernize.

In addition, technical training for the operation of modern tools is still limited. Workers admitted that they had not received adequate training in dealing with the port's digital transformation. This condition shows that there is a gap between technological progress and the development of human resource capacity in the Port environment.

E. Obstacles in the Implementation of Concessions

The research identified several major obstacles in the implementation of concessions at Sorong Port. From the regulatory aspect, there is no standard Standard Operating Procedure (SOP) at the port level, thus giving rise to differences in interpretation between regulators and operators. From the aspect of coordination, the difference in interests between KSOP and Pelindo causes decision-making in the field to be slow.

Other obstacles arise from the infrastructure aspect, such as the limitation of docks and warehouses that are not proportional to the growth of ship and freight flows. The licensing bureaucratic process is also still considered complicated. Meanwhile, in terms of human resources, the limitations of training and adaptation to modern technology make the implementation of concessions not run optimally. These obstacles show the need for a more adaptive policy to port conditions in the eastern region of Indonesia.

F. Improvement and Development Opportunities

Despite the obstacles, the results of the study also show a number of opportunities for improvement that can be optimized. First, there is a commitment by KSOP and Pelindo to strengthen transparency and accountability in concession management through more open performance reports. Second, the potential development of Sorong Port as a logistics hub in the eastern region of Indonesia provides great opportunities for increased investment and regional competitiveness.

Third, there is an opportunity to increase workforce capacity through training programs based on industrial needs. The central government's support through the Sea Toll program and the policy of accelerating the development of the eastern region of Indonesia is also an important driving factor for the optimization of concessions. With closer collaboration between KSOP, Pelindo, and the workforce, Sorong Port has the potential to become a modern, efficient, and sustainable national strategic logistics node

Discussion

The results of the study show that the implementation of concessions at Sorong Port has been carried out in accordance with the provisions of laws and regulations, especially Government Regulation No. 31 of 2021 and PM No. 48 of 2021 [28], [29]. The division of roles between KSOP Class I Sorong as the regulator and PT Pelindo Regional 4 Sorong as the operator has provided a clear legal basis for the implementation of port activities. However, its implementation in the field is not fully optimal because there is still a gap between administrative policies and operational realization. Limited technological infrastructure and human resources are the main inhibiting factors in the implementation of digitalization systems such as Inaportnet and Phinisi. This condition is in line with previous findings that highlight that many ports in Indonesia face limited infrastructure and inadequate human resource capacity, thus hampering operational efficiency and implementation of digital systems [13], [14], [19]. Thus, the success of the concession depends not only on regulation, but also on the institutional readiness and technological support of the port. [18], [21]

The coordination between KSOP and PT Pelindo IV Sorong shows a pattern of collaborative relationship, although there are still differences in orientation and priorities in implementation in the field. KSOP focuses on safety and compliance with regulations, while Pelindo focuses on service efficiency and service user satisfaction. This difference in focus is a common dynamic in port management involving regulators and operators, where the asynchrony of interests often affects the speed of decision-making [13], [17]. Efforts to establish a monthly coordination forum are a strategic step to equalize perceptions and accelerate problem solving in the field. This supports the view that the effectiveness of ports is largely determined by inter-agency collaboration and adaptive communication in the face of policy and operational changes. [7], [8]

The impact of concessions on port operational performance shows a positive direction. Improving service standards, improving facilities, and reducing ship waiting times reflect modernization efforts. However, the increase in efficiency is still limited by inadequate dock capacity and equipment. The modernization of the logistics system has not been fully followed by the improvement of supporting facilities such as storage areas and loading and unloading facilities. This is in line with the findings of Amin et al. (2021) that ports in the eastern region of Indonesia still face high logistics costs due to limited facilities and an imbalance between physical investment and operational needs [3]. Therefore, the sustainability of concession results requires continued investment policies and long-term planning for the development of port facilities. [14], [15]

From the aspect of human resources, the implementation of concessions has a double impact on the port workforce. On the one hand, the existence of concessions creates regularity in work schedules, increased discipline, and the implementation of better safety standards. However, on the other hand, the welfare of workers has not improved much. Most of the workforce is still contract and has not received adequate training to operate modern equipment. This phenomenon

reinforces the findings of Dwinovan et al. (2024) and Safuan & Syafira (2024) that technological transformation in the port sector will not be effective without simultaneous human resource capacity building [19], [20]. The gap between infrastructure progress and manpower capabilities is a strategic challenge in realizing the professionalism and efficiency of port management [22]

The obstacles found in this study reflect the complex reality of concession implementation in the field. The absence of a uniform Standard Operating Procedure (SOP) leads to different interpretations of rules between regulators and operators, as also highlighted by Wahyuni et al. (2020) and Rahayu et al. (2024) regarding the weak harmonization of policies between agencies in the marine transportation sector [17], [18]. In addition, the limitations of infrastructure and labor capacity indicate that the concession system has not fully answered the needs of ports in the eastern region of Indonesia which have different geographical and socioeconomic characteristics from large ports in Java or Sumatra [3], [15]. Thus, an adaptive approach is needed that takes into account local characteristics as well as institutional capacity in the region.

Although there are still a number of obstacles, the results of this study also show that there is a great opportunity for the development of a concession system at Sorong Port. KSOP and Pelindo's commitment to improving transparency and accountability is an important step towards more professional port governance. This is in line with the view of Munim and Schramm (2018) and Sharapiyeva et al. (2019) that improved efficiency and transparency of ports can strengthen national logistics competitiveness and attract foreign direct investment [4], [5]. The central government's policy support through the Sea Toll program and the acceleration of the development of the eastern region of Indonesia also strengthens Sorong's position as a national strategic logistics node [11], [12]. By strengthening cooperation between regulators, operators, and port workers, the implementation of concessions in Sorong has the potential to become an efficient, modern, and sustainable integrated port management model in eastern Indonesia.

IV. CONCLUSION

This study concludes that the implementation of concessions at Sorong Port has been running in accordance with the provisions of Government Regulation No. 31 of 2021 and PM No. 48 of 2021, but its effectiveness is still limited by structural and technical factors. The division of roles between KSOP Class I Sorong as the regulator and PT Pelindo Regional 4 Sorong as the operator has provided a clear legal and institutional basis for the implementation of port activities. However, gaps still arise between administrative policies and operational implementation, especially in the implementation of digitalization systems, inter-institutional coordination, and strengthening human resource capacity.

The concession has a positive impact on improving service efficiency, operational order, and the implementation of safety standards, but has not been followed by a significant improvement in the welfare of the port workforce. This shows that infrastructure modernization has not gone hand in hand with strengthening competencies and social protection for workers. In addition, the limitations of physical infrastructure such as dock capacity, warehouses, and loading and unloading equipment are still the main obstacles in achieving optimal logistics efficiency.

Institutionally, the relationship between KSOP and Pelindo shows progress towards a more collaborative partnership pattern, although there is still a need to strengthen routine coordination so that decision-making in the field is faster and responsive to the needs of service users. Obstacles in the form of the absence of uniform Standard Operating Procedures (SOPs) and limited information technology show that the success of concession implementation is highly dependent on institutional readiness and adaptation to digital developments.

By paying attention to these various challenges, a strategy to strengthen concession policies is needed through increasing human resource capacity, modernizing port infrastructure, and harmonizing regulations and coordination mechanisms between institutions. The central government's policy support through the Sea Toll program and the acceleration of the development of the eastern region of Indonesia are important momentum for Sorong Port to transform into an efficient, modern, and sustainable national strategic logistics hub.

REFERENCES

[1] F. N. T. Aritonang, J. C. Arkady, L. A. R. Torindatu, and V. A. J. M. Silalahi, “Indonesia’s Position as a Maritime Axis in the Global Logistics Chain,” *JIPOWER: Journal of Intellectual Power*, vol. 2, no. 1 SE-Articles, pp. 110–123, Apr. 2025, doi: 10.63786/jipower. v2i1.38.

[2] B. E. Afiatno and K. D. Joyoutomo, “The economic impact of dry port investment in Indonesia: A case study of Bangil, Pasuruan District, East Java Province,” *Cleaner Logistics and Supply Chain*, vol. 13, p. 100179, 2024, doi: https://doi.org/10.1016/j.clscn.2024.100179.

[3] C. Amin, H. Mulyati, E. Anggraini, and T. Kusumastanto, “Impact of maritime logistics on archipelagic economic development in eastern Indonesia,” *The Asian Journal of Shipping and Logistics*, vol. 37, no. 2, pp. 157–164, 2021, doi: https://doi.org/10.1016/j.ajsl.2021.01.004.

[4] Z. H. Munim and H.-J. Schramm, “The impacts of port infrastructure and logistics performance on economic growth: the mediating role of seaborne trade,” *Journal of Shipping and Trade*, vol. 3, no. 1, p. 1, 2018, doi: 10.1186/s41072-018-0027-0.

[5] M. D. Sharapiyeva, A. Antoni, and R. Yessenzhigitova, “The impact of port transport-logistics infrastructure and lpi for economic growth: On the example of landlocked countries,” *Pomorstvo*, vol. 33, no. 1, pp. 63–75, 2019, doi: 10.31217/p.33.1.7.

[6] B. A. Blonigen and W. W. Wilson, “Port Efficiency and Trade Flows,” *Review of International Economics*, vol. 16, no. 1, pp. 21–36, Feb. 2008, doi: https://doi.org/10.1111/j.1467-9396.2007.00723.x.

[7] W. P. Humang, R. Natsir, and A. Akbar Fisu, “Development of a Feeder Port of Tanjung Ringgit Facilities to Support Implementation of Sea Tollway,” *Jurnal Penelitian Transportasi Laut*, vol. 23, no. 1, pp. 1–8, 2021, doi: 10.25104/transla. v23i1.1699.

[8] I. N. G. D. Kenaka Yoga Iswara, “I Nyoman Gede Danendra Kenaka Yoga Iswara, Strategi PT Pelabuhan Indonesia III (Persero) dalam Pengembangan Pelabuhan Benoa sebagai Cruise Turn Around Port Strategi PT Pelabuhan Indonesia III (Persero)

dalam Pengembangan Pelabuhan Benoa sebagai Cruise Turn Around Port I Nyoman Gede Danendra Kenaka Yoga Iswara," *Business and Finance Journal,* vol. 4, no. 2, pp. 147–160, 2019.

[9] D. J. Arisusanty, Y. Arkeman, S. Rahardjo, and D. A. Soeboer, "Analisa Menentukan Kriteria Pemilihan Pelabuhan Pengumpan Tol Laut Menggunakan Metode Ahp," *ALBACORE Jurnal Penelitian Perikanan Laut*, vol. 2, no. 1, pp. 57–67, 2018, doi: 10.29244/core.2.1.57-67.

[10] A. Sarjito, "Peran Teknologi Dalam Pembangunan Kemaritiman Indonesia," *Jurnal Lemhannas RI*, vol. 11, no. 4, pp. 219–236, 2023, doi: 10.55960/jlri. v11i4.483.

[11] Y. Yusnidah, R. Mujiono, S. Suparman, and S. Syahrani Lisa, "Peran Kantor Kesyahbandaran Dan Otoritas Pelabuhan Kelas Iv Sibolga Dalam Mewujudkan Keselamatan Pelayaran Di Pelabuhan Sibolga," *Journal of Maritime and Education (JME)*, vol. 7, no. 2 SE-, pp. 845–848, Aug. 2025, doi: 10.54196/jme. v7i2.206.

[12] N. Muammar and A. Mosyofa, "Kebijakan Maritim Indonesia Dalam Menunjang Sistem Keamanan Transportasi Laut," *Riset Sains dan Teknologi Kelautan*, vol. 7, no. 1, pp. 46–50, 2024, doi: 10.62012/sensistek. v7i1.31639.

[13] I. Amsyari, I. Gautama So, Z. Abidin, and A. A. Priadi, "Analysis of Concession, Technology, and Service Implementation on Port Infrastructure Performance: A Case Study in DKI Jakarta and Banten Provinces," *Jurnal Penelitian Transportasi Laut*, vol. 26, no. 1, pp. 32–49, 2025, doi: 10.25104/transla. v26i1.2371.

[14] I. Robbany, F. Suhariadi, and A. Budihardjo, "Determinants of port performance: an evaluation and measurement of port services in Indonesia," *International journal of health sciences*, vol. 6, no. S7 SE-Peer Review Articles, pp. 760–774, Jul. 2022, doi: 10.53730/ijhs. v6nS7.11242.

[15] S. Siswanto, H. Subiyantoro, and C. Ratnasih, "Factors affecting the performance of sea transportation and Port Infrastructure Development and its implications for the economic growth of the maritime sector in Indonesia," *Nomico*, vol. 2, no. 2, pp. 17–25, 2025, doi: 10.62872/2fzb1d82.

[16] C. Duffield, F. K. P. Hui, and S. Wilson, *Infrastructure Investment in Indonesia: A Focus on Ports*. Cambridge: Open Book Publishers, 2019. doi: https://doi.org/10.11647/OBP.0189.

[17] L. Rahayu, T. Busscher, T. Tillema, and J. Woltjer, "Maritime transport governance challenges in the Global South," *Marine Policy*, vol. 163, p. 106147, 2024, doi: https://doi.org/10.1016/j.marpol.2024.106147.

[18] S. Wahyuni, A. A. Taufik, and F. K. P. Hui, "Exploring key variables of port competitiveness: evidence from Indonesian ports," *Competitiveness Review*, vol. 30, no. 5, pp. 529–553, May 2020, doi: 10.1108/CR-11-2018-0077.

[19] Safuan and A. Syafira, "Artificial Intelligence in Indonesian Ports: Opportunities and Challenges," *Transactions on Maritime Science*, vol. 13, no. 2 SE-Regular Paper, Jul. 2024, doi: 10.7225/toms. v13.n02.w07.

[20] N. Dwinovan, A. Dillah, F. Najmuddin, and K. Verawati, "Eksplorasi Potensi Penggunaan Blockchain Dalam Optimalisasi Manajemen Pelabuhan di Indonesia: Tinjauan Literatur," *Jurnal Multidisiplin Dehasen (MUDE)*, vol. 3, no. 3 SE-Articles, Jul. 2024, doi: 10.37676/mude. v3i3.6548.

[21] H. Prasetyo, . S., . S., and M. Nuh, "Collaborative Governance in Port Management in Indonesia: A Literature Review," *Journal of Posthumanism*, vol. 5, no. 5 SE-, pp. 2693–2700, May 2025, doi: 10.63332/joph. v5i5.1663.

[22] D. R. Utama, M. Hamsal, R. K. Rahim, and A. Furinto, "The effect of digital adoption and service quality on business sustainability through strategic alliances at port terminals in Indonesia," *The Asian Journal of Shipping and Logistics*, vol. 40, no. 1, pp. 11–21, 2024, doi: https://doi.org/10.1016/j.ajsl.2023.12.001.

[23] Kurdi and I. Polem, "The Role Of Public-Private Partnerships (Ppp) In Overcoming Budgetary And Bureaucratic Barriers In Infrastructure Development In Indonesia," *Bengkoelen Justice: Jurnal Ilmu Hukum*, vol. 15, no. 1, pp. 44–63, Apr. 2025, doi: 10.33369/jbengkoelenjust. v15i1.38836.

[24] M. Nahdi, N. Widayati, M. A. Wibowo, E. M. Sari, R. Z. Tamin, and A. Thohirin, "Examining Solicited Projects of Public–Private Partnerships (PPP) in the Initiative of Indonesian Government," 2024. doi: 10.3390/buildings14061870.

[25] T. K. Wiratama, I. P. Sagir, and U. Kaltum, "Implementasi Konsep Dynamic Capacity Dalam Peningkatan Kapasitas Terminal 1 Bandara Internasional Soekarno Hatta," *Warta Ardhia*, vol. 47, no. 1, pp. 27–50, 2021, doi: 10.25104/wa.v47i1.417.27-50.

[26] G. Badzlina, "The Influence of Capital and Transportation in the Implementation of the Public Private Partnership Scheme," *Journal of Economics, Finance and Management Studies*, vol. 06, no. 03, pp. 1139–1148, 2023, doi: 10.47191/jefms/v6-i3-13.

[27] W. Kurniawan, "The Role of Law in Public Private Partnerships: Indonesia," *Journal of Law, Policy and Globalization*, vol. 115, no. 2017, pp. 91–98, 2021, doi: 10.7176/jlpg/115-12.

[28] Kementerian Perhubungan Republik Indonesia, Peraturan Menteri Perhubungan Republik Indonesia Nomor PM 48 Tahun 2021 tentang Konsesi dan Kerja Sama Bentuk Lainnya antara Penyelenggara Pelabuhan dengan Badan Usaha Pelabuhan di Bidang Kepelabuhanan. Indonesia, 2021.

[29] Pemerintah Republik Indonesia, Peraturan Pemerintah Republik Indonesia No.31 Tahun 2021 Tentang Penyelenggaraan Bidang Pelayaran. Indonesia, 2021.