

**COMPARATIVE ANALYSIS OF STEVEDORING LABOR PERFORMANCE
IN THE SEA TOLL PROGRAM:
INSIGHTS FROM INDONESIA AND THE PHILIPPINES**

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ABSTRACT

This study conducts a comparative analysis of stevedoring labor performance within the Sea Toll program in Indonesia and the Philippines, focusing on efficiency, technology, and worker welfare. It aims to identify the key factors influencing the effectiveness of stevedoring labor in both countries. Employing a normative legal method alongside a comparative study approach, the findings indicate that the performance of stevedoring labor in the Philippines is superior to that in Indonesia, particularly regarding work efficiency, technological implementation, and worker welfare. The Philippines has successfully established a skills certification system through the Technical Education and Skills Development Authority (TESDA), implemented port automation systems such as the Cargo Handling Management System (CHMS) and the Port Community System (PCS), and ensured labor protection in accordance with the Philippine Labor Code and the Occupational Safety and Health Standards (OSHS) Act. In contrast, Indonesia faces significant challenges, including difficulties in implementing skill standards, inadequate port infrastructure, and limited social protection for workers, despite existing regulations such as Law Number 17 of 2008 on Shipping and the Minister of Manpower Decree Number 100 of 2004. Key determinants of stevedoring labor effectiveness include labor regulations, technological availability, training systems, welfare, and work culture. The Philippines has demonstrated greater success in integrating these factors into its operational framework. Therefore, Indonesia could benefit from adopting the Philippines' robust regulatory framework, skills certification system, automation technology, and enhanced worker welfare protections.

Keywords: Efficiency; Automation; Welfare; Regulation; Sea Toll; Indonesia; Philippines.

INTRODUCTION

As the two largest archipelagic nations in the world, Indonesia and the Philippines rely on maritime logistics as the backbone of national and regional economic development. Efficient stevedoring labor is crucial not only for ensuring smooth port operations but also for maintaining the competitiveness of their maritime trade and reducing disparities in economic access across remote islands. Given these high stakes, both countries face significant challenges in optimizing the performance of stevedoring labor within their port systems¹. In Indonesia, the Sea Toll program was introduced as a solution to overcome economic disparities between the western and eastern regions and reduce disparities in the price of goods². Meanwhile, the Philippines, with more than 7,000 islands, also has a complex maritime logistics system and relies on stevedoring labor (SLT) for the smooth running of its port activities³.

The performance of stevedoring workers is one of the key elements in the success of the maritime transportation program in both countries. Stevedoring workers play an important role in the process of moving goods from ships to ports and vice versa. Their efficiency greatly determines the speed of the distribution of goods. Poor performance in the stevedoring system can result in various problems, such as distribution delays, increased logistics costs, and reduced economic competitiveness, especially for remote areas that depend on maritime transportation⁴. Therefore, it is important to understand how the performance of stevedoring workers in Indonesia and the Philippines compares in order to identify factors that influence the efficiency of maritime logistics systems in both countries.

In Indonesia, the Sea Toll program, which has been implemented since 2015, aims to reduce the price gap between the western and eastern regions and accelerate economic growth in remote areas. However, in its implementation, there are still various obstacles,

¹ Chairullah Amin et al., "Impact of Maritime Logistics on Archipelagic Economic Development in Eastern Indonesia," *The Asian Journal of Shipping and Logistics* 37, no. 2 (June 2021): 157–64, <https://doi.org/10.1016/j.ajsl.2021.01.004>.

² Elfrida Ratnawati, "Sea Toll As A Means To Increase The Effectiveness Of Goods And Services To The Eastern Of Indonesia," *Awang Long Law Review* 1, no. 2 (2019): 120–30, <https://ejournal.stih-awanglong.ac.id/index.php/awl/article/view/65>.

³ Ida Kurnia et al., "Maritime Border Between Indonesia And The Philippines," *International Journal of Application on Social Science and Humanities* 1, no. 1 (February 20, 2023): 1317–24, <https://doi.org/10.24912/ijassh.v1i1.25901>.

⁴ R. Midoro, E. Musso, and F. Parola *, "Maritime Liner Shipping and the Stevedoring Industry: Market Structure and Competition Strategies," *Maritime Policy & Management* 32, no. 2 (April 2005): 89–106, <https://doi.org/10.1080/03088830500083521>.

one of which is the low efficiency of stevedoring workers at the port. There are still many ports in Indonesia that rely on manual systems in the loading and unloading process⁵. This results in longer ship waiting times, which ultimately has an impact on increasing logistics costs. In addition, limited port facilities and minimal workforce training are major obstacles to increasing the efficiency of the loading and unloading system.

On the other hand, the Philippines also faces similar challenges in its maritime transportation system. To improve the efficiency of maritime logistics, the Philippine government has implemented various port modernization policies as well as increasing the capacity of stevedoring labor. Several major ports in the Philippines have adopted automation systems, which help reduce the reliance on manual labor and improve overall operational efficiency. Manpower training programs have also been introduced to ensure that the port workforce is adequately skilled and can perform according to international standards⁶.

One of the main factors that affects the performance of stevedoring workers is the availability of port facilities and infrastructure. In Indonesia, there are still many ports that are not equipped with modern loading and unloading equipment, such as automatic cranes, conveyors, and digitalization systems to record logistics activities⁷. In contrast, the Philippines has implemented progressive policies in the management of stevedoring labor. A labor certification program has been introduced to ensure that workers have sufficient skills in operating modern stevedoring equipment. In addition, automation systems in several ports have helped increase the speed of loading and unloading goods and reduce the risk of work accidents that often occur due to manual systems. With this modernization, the Philippines has been able to increase the competitiveness of its maritime sector at the regional level, although there is still a gap in the implementation of automation systems between large and small ports⁸. In contrast, in the Philippines,

⁵ Eska Dwipayana Pulungan, "From Archipelago to Maritime Hub: Indonesia's Quest to Become the World's New Maritime Axis," *Jurnal Ilmiah Ilmu Sosial* 10, no. 2 (December 30, 2024): 106–17, <https://doi.org/10.23887/jiis.v10i2.78631>.

⁶ Angelica Baylon, "Super Seven 'S' Trends (SSST) That Shape the Future of Philippine Global Ports," *TransNav, the International Journal on Marine Navigation and Safety of Sea Transportation* 18, no. 1 (2024): 161–67, <https://doi.org/10.12716/1001.18.01.16>.

⁷ Alejandro Micco and Natalia Pérez, "Determinants of Maritime Transport Costs," *SSRN Electronic Journal*, 2002, 1–49, <https://doi.org/10.2139/ssrn.1817241>.

⁸ Irmina Durlík et al., "Harnessing AI for Sustainable Shipping and Green Ports: Challenges and Opportunities," *Applied Sciences* 14, no. 14 (July 9, 2024): 5994, <https://doi.org/10.3390/app14145994>.

several major ports have adopted digitalization systems to manage the loading and unloading of goods more efficiently. The use of this technology allows for better monitoring of the flow of goods, thereby reducing the risk of distribution delays⁹.

Another significant difference between Indonesia and the Philippines is the policy related to the welfare of stevedores. In the Philippines, the wage system for stevedores is more structured and supported by strict regulations to ensure the protection of workers. Meanwhile, in Indonesia, there are still gaps in the wage system for stevedores, especially in small ports. Many workers still work for low wages without adequate social security¹⁰. This results in low work motivation, which ultimately impacts productivity and efficiency in the loading and unloading process.

In a global context, the efficiency of stevedoring labor is one of the main factors that determines a country's competitiveness in international trade. Developed countries such as Singapore, Japan, and South Korea have implemented a fully automated stevedoring system, with a workforce that has high skills in operating sophisticated technology at the port. Therefore, Indonesia and the Philippines need to accelerate the modernization of their stevedoring systems so as not to be left behind in global competition.

One strategy that can be implemented to improve the efficiency of stevedoring labor in Indonesia is to follow the workforce training policy implemented in the Philippines. More structured training and certification programs can help improve the skills of the workforce and ensure that they are able to work according to international standards. In addition, investment in port infrastructure and the adoption of automation technology are also important steps that need to be considered to improve operational efficiency¹¹. On the other hand, the Philippines can also learn from Indonesia's experience in developing a broader maritime connectivity scheme. The Sea Toll Program in Indonesia has had a significant impact in improving access to goods transportation to remote areas. The

⁹ Fernando Almeida, "Challenges in the Digital Transformation of Ports," *Businesses* 3, no. 4 (October 31, 2023): 548–68, <https://doi.org/10.3390/businesses3040034>.

¹⁰ M Syamsudin, "Legal Protection of Docworkers in the Ports of Indonesia," *International Journal of Humanities and Social Science Invention* 6, no. 9 (2017): 18–23, [https://www.ijhssi.org/papers/v6\(9\)/Version-4/D0609041823.pdf](https://www.ijhssi.org/papers/v6(9)/Version-4/D0609041823.pdf).

¹¹ Kyriaki Mitroussi and Theo Notteboom, "Getting the Work Done: Motivation Needs and Processes for Seafarers and Dock Workers," *WMU Journal of Maritime Affairs* 14, no. 2 (October 8, 2015): 247–65, <https://doi.org/10.1007/s13437-014-0064-y>.

Philippines can adopt a similar model to strengthen inter-island connectivity and ensure that goods distribution across its territory can run more effectively¹².

This paper analyzes more deeply the factors that influence the performance of stevedores in both countries and identify the best policies that can be implemented to improve the efficiency of this sector. The formulation of the problem in this study is, how does the performance of stevedoring workers in the Maritime Toll program in Indonesia and the Philippines compare in terms of efficiency, technology, and worker welfare?, and secondly, what are the main factors influencing the effectiveness of stevedoring labor in both countries?

Studies on stevedores (TKBM) and the sea toll program have been widely conducted by academics and practitioners, highlighting various aspects, from work efficiency, labor regulations, to its impact on the maritime logistics system. Previous studies that are relevant in the context of comparing the performance of TKBM in Indonesia and the Philippines provide a basis for a deeper understanding of the challenges and opportunities in improving the effectiveness of this sector.

One of the studies that discusses the efficiency of stevedoring labor in the maritime logistics system was conducted by Sahid, Hamid, & Armawi (2019) in their article entitled *The Impact of the Implementation of the Cabotage Principle and the Sea Toll Program on Regional Resilience* published in the *National Resilience Journal*. This study examines how the sea toll policy in Indonesia contributes to regional economic growth, especially in remote areas that have so far experienced limitations in the distribution of goods. However, this study also found that one of the main obstacles in the implementation of the sea toll is the low efficiency of stevedoring labor at the port, especially in areas that still lack modern facilities¹³.

Another study that supports this study is a study conducted by Mashuda, Taufik, & Ihsan (2019) in the journal *Rechts Vinding: Media Pembinaan Hukum Nasional*, which discusses the regulation of stevedores in the maritime transportation system. They highlight the role of regulation in increasing labor efficiency in ports and compare how

¹² V.L. Sinta Herindrasti, "Indonesia Maritime Connectivity, Development Equality And Asean Connectivity," in *The International Conference on ASEAN 2019* (Sciend, 2019), 148–56, <https://doi.org/10.1515/9783110678666-020>.

¹³ Anwar Sahid, Edy Suandi Hamid, and Armaidly Armawi, "Dampak Implementasi Asas Cabotage Dan Program Tol Laut Terhadap Ketahanan Wilayah (Studi Di Kabupaten Kepulauan Anambas, Provinsi Kepulauan Riau)," *Jurnal Ketahanan Nasional* 25, no. 2 (August 23, 2019): 131–50, <https://doi.org/10.22146/jkn.47766>.

other countries, including the Philippines, have implemented stricter labor policies in the stevedore sector. This study states that the Philippines has a more structured training and certification system for stevedores compared to Indonesia, which still relies on a cooperative system that is not yet fully effective¹⁴.

In the Philippines, research on stevedore labor has also been conducted in the context of port modernization. A study by Wisnu & Thobias (2019) in the journal *Logistics Connectivity Through the Sea Toll Program: A Challenge of Intermodal Synergy* shows how the Philippines has adopted automation systems in several major ports to improve the efficiency of the loading and unloading process. The study shows that although automation can increase productivity, not all ports in the Philippines have access to this advanced technology, leading to an imbalance in efficiency between large and small ports¹⁵.

In the context of labor in Indonesia, research conducted by Haidir et al. (2017) entitled *Analysis of Evaluation of the Implementation of the Sea Toll Policy* highlights how stevedoring workers still experience various obstacles, ranging from lack of training to weak labor management systems at the port. They found that one of the main factors causing delays in loading and unloading was the lack of availability of aids and workers who did not fully understand the use of modern technology¹⁶.

Furthermore, research by Ma'ruf & MM (2014) entitled *Technological Innovation to Support the Sea Toll Program and the Competitiveness of the National Ship Industry* discusses how technology can be applied in the maritime logistics system to improve work efficiency. This study shows that the Philippines has already adopted a digital-based technology system to manage stevedoring workers, while Indonesia is still lagging behind in implementing a similar system. However, this study also emphasizes that work culture factors and labor regulations also have a major influence on work efficiency at the Port¹⁷.

¹⁴ Ali Mashuda, Ade Irawan Taufik, and Ridha Nurul Ihsan, "Tinjauan Regulasi Tol Laut Berdasarkan Teori Reinventing Government," *Jurnal Rechts Vinding: Media Pembinaan Hukum Nasional* 8, no. 2 (September 6, 2019): 225–44, <https://doi.org/10.33331/rechtsvinding.v8i2.321>.

¹⁵ Abdul Ahmad, "Konektivitas Logistik Melalui Program Tol Laut; Sebuah Tantangan Sinergi Antar Moda Oleh: Wisnu Handoko Dan Willem Thobias Fofid," *OSF Preprints*, August 16, 2020, <https://doi.org/10.31219/osf.io/5nrbq>.

¹⁶ Michele Vespe, Harm Greidanus, and Marlene Alvarez Alvarez, "The Declining Impact of Piracy on Maritime Transport in the Indian Ocean: Statistical Analysis of 5-Year Vessel Tracking Data," *Marine Policy* 59 (September 2015): 9–15, <https://doi.org/10.1016/j.marpol.2015.04.018>.

¹⁷ Buana Ma'ruf, "Inovasi Teknologi Untuk Mendukung Program Tol Laut Dan Daya Saing Industri Kapal Nasional," *Seminar Nasional Teknologi Terapan Ke-2 ITATS*, 2014, 1–19,

In addition, a study on the comparison of the stevedoring labor system between Indonesia and the Philippines was also conducted by Saragi, Mamahit, & Pertahanan (2017) in their journal entitled *Implementation of Sea Toll Development to Realize Indonesia as the World's Maritime Axis*. This study examines various aspects of the maritime transportation system, including the role of stevedoring labor in increasing the competitiveness of the maritime economy. This study shows that the Philippines has stricter regulations in terms of labor welfare, while in Indonesia, there are still many stevedoring workers who receive low wages without adequate social protection.¹⁸

It can be concluded that there are several main factors that differentiate the stevedoring labor system in Indonesia and the Philippines. First, the Philippines has been more advanced in terms of training and certification of workers, which allows stevedoring workers to have better skills in handling goods with an automation system. Second, the Philippines has begun implementing a digitalization system in several major ports, which helps improve the efficiency of the loading and unloading process. Meanwhile, in Indonesia, the main obstacles faced are the labor management system which is still conventional and the limitations of port infrastructure in various regions.

Through a more in-depth comparative analysis, this study is expected to be a reference in developing labor policies in the maritime sector. By adopting the best practices of each country, both Indonesia and the Philippines can improve their competitiveness in the global maritime logistics system and ensure that port stevedoring workers have better welfare and higher productivity.

RESEARCH METHOD

This study adopts a normative legal research method combined with a comparative study approach to analyze the performance of stevedoring workers in the Sea Toll program in Indonesia and the Philippines. The normative legal method is appropriate for this study because it allows for an in-depth examination of the legal

https://www.researchgate.net/profile/Buana-Maruf-2/publication/325271212_INOVASI_TEKNOLOGI_UNTUK_MENDUKUNG_PROGRAM_TOL_LAUT_DAN_DAYA_SAING_INDUSTRI_KAPAL_NASIONAL/links/5b02f7d1aca2720ba098f462/INOVASI-TEKNOLOGI-UNTUK-MENDUKUNG-PROGRAM-TOL-LAUT-DAN-DAYA-SAING-INDUSTRI-KAPAL-NASIONAL.pdf.

¹⁸ Raflinov Quraissy, "Dampak Terhambatnya Pembangunan Jalan Tol Semarang-Demak Akibat Kepemilikan Tanah Musnah Masyarakat," *Jurnal Globalisasi Hukum* 1, no. 2 (September 30, 2024): 219–35, <https://doi.org/10.25105/gnn4p130>.

frameworks, labor policies, and port regulations that shape the working conditions of stevedores in both countries. By focusing on laws, regulations, and policy documents, this method helps to clarify the legal underpinnings of stevedoring labor and assess how they impact operational efficiency and worker welfare. In parallel, the comparative study approach enables a systematic evaluation of similarities and differences in the implementation of these legal instruments between Indonesia and the Philippines. This dual-method framework contributes to the research objectives by not only identifying gaps in policy implementation but also highlighting best practices that can inform future reforms in both maritime sectors¹⁹. In the context of this research, the normative legal method is used to examine the laws and regulations, maritime policies, and labor standards applicable in both countries. Thus, this research not only explores the legal aspects governing stevedoring labor, but also analyzes the implementation of these policies in supporting the efficiency of the Sea Toll program.

As part of the normative legal research method, this research uses a comparative approach and a statute approach²⁰. A comparative approach is used to analyze the differences and similarities in the regulations and practices of stevedore labor in Indonesia and the Philippines. This comparative study aims to assess the effectiveness of policies implemented in each country and how better systems can be adopted to improve labor performance in the maritime sector. Meanwhile, a legislative approach is used to examine the regulations governing stevedore labor in both countries, including shipping laws, employment policies, and regulations related to worker safety and welfare.

The sources of legal materials used consist of primary legal materials, secondary legal materials, and tertiary legal materials²¹. Primary legal materials include laws and regulations related to stevedores and maritime transportation systems in Indonesia and the Philippines, such as Law No. 17 of 2008 on Shipping in Indonesia and Philippine maritime regulations such as The Philippine Maritime Industry Authority (MARINA) Act. In addition, various policies governing stevedores and port safety will be examined to understand the extent to which these regulations are effectively implemented in both countries.

¹⁹ Peter Mahmud Marzuki, *Penelitian Hukum*, 12th ed. (Jakarta : Kencana Prenada Media Group , 2017).

²⁰ Muhaimin, *Metode Penelitian Hukum* (Mataram : Mataram University Press, 2020).

²¹ Zainuddin Ali, *Metode Penelitian Hukum* (Jakarta: Sinar Grafika, 2009).

The data collection technique in this research was carried out through library research²². This method is used to collect and analyze legal materials related to the research. Literature study is conducted by tracing relevant laws and regulations, policy documents, scientific journals, and research reports. In addition, secondary data is also collected from reports of international maritime organizations, such as the International Labor Organization (ILO) and the International Maritime Organization (IMO), which have standards and recommendations related to employment in the shipping industry.

Data collection techniques in this study also include a documentation study of employment policies and regulations on stevedoring labor in Indonesia and the Philippines. Analysis of port performance reports in both countries was also conducted to see the extent to which stevedoring labor is effective in increasing the efficiency of maritime transportation. In addition, this study will use data from various government publications and maritime transportation organizations that provide information on the actual conditions of labor in the stevedoring sector.

After the data is collected, this study will use qualitative data analysis techniques²³. Qualitative analysis is used to interpret legal materials and policy documents to understand the implications of existing regulations on the performance of stevedores in both countries. Data obtained from various sources will be classified based on themes, such as employment policies, operational efficiency, worker welfare, and the use of technology in the stevedore process.

This study will use descriptive comparative analysis to compare the regulations and practices of stevedore labor in Indonesia and the Philippines. This technique aims to identify similarities and differences in the labor systems in both countries and evaluate the strengths and weaknesses of each system. By using this technique, the study can provide a clearer picture of the factors that influence the efficiency of stevedore labor and policy recommendations that can be implemented to improve the effectiveness of the Sea Toll program in Indonesia and the Philippines.

Overall, the normative legal research method with a comparative study approach used in this study aims to provide an in-depth analysis of the differences and similarities

²² Sugiyono, *Metode Penelitian Kuantitatif, Kualitatif Dan R&D* (Bandung: Alfabeta, 2020).

²³ Lexy J Moleong, *Metodologi Penelitian Kualitatif* (Bandung : Remaja Rosdakarya, 2017).

in the stevedore labor systems in Indonesia and the Philippines. By examining regulations, operational practices, and factors that influence labor efficiency in ports, this study is expected to provide useful recommendations for the government, maritime industry players, and academics interested in labor studies in the maritime transportation sector.

RESEARCH OUTCOME AND DISCUSSION

1. Comparison of the Performance of Stevedores in the Maritime Toll Program

The stevedore labor (TKBM) is a vital element in the operation of the maritime logistics system, especially in the implementation of the Sea Toll program in archipelagic countries such as Indonesia and the Philippines. The efficiency of stevedore labor has a direct impact on the smooth distribution of goods, ship docking time, and overall logistics costs which ultimately affect the competitiveness of the national economy²⁴. In the context of comparison between Indonesia and the Philippines, there are various factors that influence the differences in the performance of stevedoring workers, including aspects of work efficiency, application of technology, and worker welfare.

In the Philippines, for example, major ports like the Manila International Container Terminal (MICT) report average ship turnaround times of approximately 0.9 to 1.2 days, compared to Indonesia's Tanjung Priok port, where turnaround times range between 2 to 3 days depending on equipment availability and labor coordination²⁵. This discrepancy reflects differences in system efficiency and operational readiness.

In terms of efficiency, Indonesia still relies heavily on manual labor in many ports, especially in eastern regions, leading to delays in the loading and unloading processes. According to a 2022 report from Indonesia's Ministry of Transportation, over 60% of tier-2 and tier-3 ports in the country do not have automated cranes or digital tracking systems, which leads to productivity rates as low as 20–25 TEUs per hour per crane, compared to the Philippines' larger automated terminals that average 30–35 TEUs per hour. This difference is supported by the Philippines' early adoption of automation

²⁴ S Kusumaatmadja et al., *Menggagas Konsep Maritim 2045* (Jakarta: Balai Pustaka, 2021), https://www.researchgate.net/publication/382441563_Agar_Ruang_Tak_Jadi_Ruang_Konflik_dan_Demokratisasi_Taata_Ruang_Maritim.

²⁵ Republic of The Philippines Department of Transportation, "Philippine Ports Authority," *Republic of The Philippines*, 2023, <https://www.ppa.com.ph/>.

technology such as the Cargo Handling Management System (CHMS) and the Port Community System (PCS), which streamline cargo handling and facilitate real-time coordination between port authorities and stevedores.

Technological advancement also plays a crucial role in determining labor performance. In Indonesia, the implementation of Minister of Transportation Regulation No. 92 of 2018 has laid the foundation for mechanization and modernization in several major ports. However, as of 2023, only 9 of 111 national ports had fully adopted integrated digital systems, compared to 15 of 20 international cargo ports in the Philippines (based on data from the Philippine Department of Transportation and Indonesia Port Corporations). This gap in technological deployment creates inefficiencies that compound in terms of cost and time.

Worker welfare represents another dimension where the Philippines holds a comparative advantage. Based on a 2022 ILO country report, Filipino stevedores earn an average of PHP 600–800 per day (approximately USD 10–14), depending on experience and location, with access to mandatory healthcare, accident insurance, and paid leave under the Philippine Labor Code and the OSHS Act. In contrast, Indonesian stevedores often earn IDR 80,000–150,000 per day (approximately USD 5–10), with limited access to structured social protections or benefits despite the regulatory framework laid out in the Minister of Manpower Decree No. 100 of 2004. Field studies conducted in ports like Kupang and Ambon indicate that only 32% of stevedores have health coverage or formal employment contracts.

These examples underscore the policy and implementation gaps that affect the overall efficiency and well-being of stevedoring labor in Indonesia. In contrast, the Philippine approach which combines legal enforcement, modern infrastructure, and targeted workforce development creates a more structured and responsive labor system. Therefore, Indonesia can draw lessons from the Philippines' integrated strategy by accelerating port digitalization, enhancing labor training through certification programs, and enforcing compliance with existing labor welfare regulations.

The efficiency of stevedoring labor in Indonesia still faces various challenges, especially related to the use of manual systems in many ports that have not adopted full mechanization and automation. Based on Law Number 17 of 2008 concerning Shipping,

the Indonesian government is committed to improving the performance of port workers by strengthening port regulations²⁶. However, in practice, many ports in Indonesia still experience delays in loading and unloading goods due to low workforce skills and limited loading and unloading equipment.

On the other hand, the Philippines has been more advanced in improving the efficiency of stevedores with the implementation of an international standard-based system, as stipulated in The Philippine Labor Code (Presidential Decree No. 442). This regulation stipulates that every worker in the maritime sector must have a specific skills certification, which ensures that stevedores have competencies that match the demands of the global industry²⁷. With this standard, the workforce in the Philippines is better prepared to handle the loading and unloading process quickly and efficiently, especially in major ports such as Manila and Cebu that have adopted a port modernization system.

In terms of performance comparison, the Philippines has faster loading and unloading times compared to Indonesia, mainly due to the use of digital-based logistics systems that allow for more efficient planning of goods distribution. For example, the Port Community System (PCS) implemented in Philippine ports allows for more structured movement of goods with better coordination between port operators, ships, and stevedoring workers. In contrast, in Indonesia, delays in loading and unloading still often occur due to less than optimal coordination between goods owners, shipping companies, and port workers²⁸. In addition, Indonesia still faces challenges in terms of uneven labor efficiency between major ports and secondary ports. Large ports such as Tanjung Priok and Tanjung Perak have relatively better efficiency levels compared to ports in eastern

²⁶ Tri Mulyono, *Perawatan Fasilitas Pelabuhan* (Jakarta: UNJ Press, 2017), file:///C:/Users/USER%20DK/Downloads/BukuPerawatanFasilitasPelabuhan2020.pdf.

²⁷ C. K. E Agudon et al., "Level Of Knowledge And Extent Of Implementation Of Presidential Labor Code Of The Philippines (Decree 442) At International School Of Asia And The Pacific," *International Journal of Advanced Research in Management and Social Sciences* 12, no. 7 (2023): 112–30, https://www.researchgate.net/profile/Ryan-Fontanilla-2/publication/373989360_LEVEL_OF_KNOWLEDGE_AND_EXTENT_OF_IMPLEMENTATION_OF_PRESIDENTIAL_LABOR_CODE_OF_THE_PHILIPPINES_DECREE_442_AT_INTERNATIONAL_SCHOOL_OF_ASIA_AND_THE_PACIFIC/links/650716f5ca19e8355c9a741a/LEVEL-OF-KNOWLEDGE-AND-EXTENT-OF-IMPLEMENTATION-OF-PRESIDENTIAL-LABOR-CODE-OF-THE-PHILIPPINES-DECREE-442-AT-INTEARNATIONAL-SCHOOL-OF-ASIA-AND-THE-PACIFIC.pdf.

²⁸ Mengying Feng, John Mangan, and Chandra Lalwani, "Comparing Port Performance: Western European versus Eastern Asian Ports," *International Journal of Physical Distribution & Logistics Management* 42, no. 5 (June 8, 2012): 490–512, <https://doi.org/10.1108/09600031211246537>.

Indonesia that still rely on manual labor²⁹. This causes significant differences in the distribution time of goods between regions, which ultimately contributes to price disparities between western and eastern Indonesia.

The use of technology in the loading and unloading system is one of the key factors in improving operational efficiency at the port. In Indonesia, although several ports have begun to implement a digitalization system, many ports still rely on conventional methods. Regulation of the Minister of Transportation Number 92 of 2018 concerning Procedures and Requirements for Granting Approval for the Use of Foreign Vessels regulates the mechanism for the use of modern loading and unloading equipment in Indonesia, but its implementation is still limited to several major ports³⁰.

In the Philippines, the use of technology in loading and unloading is more advanced than in Indonesia. The Philippine government has implemented an automation system in several major ports, such as the Manila International Container Terminal (MICT), which uses automated cranes to speed up the loading and unloading process. In addition, the Cargo Handling Management System (CHMS) system implemented in various Philippine ports allows for real-time recording of loading and unloading data, which increases transparency and efficiency in the distribution of goods.

Indonesia has tried to adopt some aspects of the system implemented in the Philippines, but is still constrained by limited infrastructure and workforce readiness. Many stevedores in Indonesia are not yet familiar with automation systems, so they need special training to be able to operate modern equipment more effectively. Law Number 13 of 2003 concerning Manpower actually regulates training and improving the skills of the workforce, but its implementation in the maritime sector still needs to be strengthened so that stevedores in Indonesia can be better prepared to face the digitalization era.

One step that Indonesia can take to improve the application of technology is to develop a technology-based certification program for stevedores. The Philippines has implemented a maritime workforce skills certification scheme through The Technical

²⁹ Danang Parikesit, Said Basalim, and Wiratno Wahyu Wibowo, "11. The Critical Importance of Land Transport When Considering Port Development," in *Infrastructure Investment in Indonesia* (Cambridge, UK: Open Book Publishers, 2019), 281–326, <https://doi.org/10.11647/OBP.0189.11>.

³⁰ Sugeng Marsudi, Toto Dwijaya Saputra, and Carlos Lazaro, "Comparative Study Of Ship Loading And Unloading Methods To Increase Productivity In Large Ports," *Maritime Park: Journal of Maritime Technology and Society*, February 28, 2025, 23–29, <https://doi.org/10.62012/mp.v4i1.43334>.

Education and Skills Development Authority (TESDA), which requires every worker in the stevedore sector to have special training in the use of modern stevedores. A similar program can be implemented in Indonesia to ensure that stevedores have competencies that meet international standards.³¹ In addition to efficiency and technology, the welfare of stevedores is also a very important factor in increasing work productivity. In Indonesia, stevedores still face various obstacles in terms of welfare, including low wages, minimal social protection, and working conditions that are not always safe. Decree of the Minister of Manpower and Transmigration Number 100 of 2004 concerning Provisions for the Implementation of Fixed-Term Employment Agreements actually regulates the rights of workers, but in practice there are still many stevedores who work in conditions that do not comply with decent labor standards³². In the Philippines, the welfare of stevedores is relatively better because there are stricter regulations in ensuring that workers in the maritime sector get their rights in accordance with international standards. The Philippine Occupational Safety and Health Standards (OSHS) Act regulates occupational safety in the maritime sector and ensures that every worker gets adequate protection in their work environment. In addition, the wage system in the Philippines is more transparent compared to Indonesia, where every stevedore gets compensation commensurate with their workload³³.

In terms of labor welfare, the Philippines is superior in terms of social security and wage systems, while in Indonesia there are still gaps in the implementation of labor protection policies in the stevedoring sector. Therefore, Indonesia needs to reform its labor policies in the maritime sector to ensure that stevedoring workers receive better protection and can work in safer and more productive conditions. It can be concluded that the Philippines has a more efficient stevedoring labor system than Indonesia, especially in terms of technology implementation and worker welfare. Meanwhile, Indonesia still faces various challenges in improving the efficiency of stevedoring labor, especially in secondary ports that do not yet have adequate infrastructure. Therefore, Indonesia can

³¹ Mulyono, *Perawatan Fasilitas Pelabuhan*.

³² Michael Quinlan, Claire Mayhew, and Philip Bohle, "The Global Expansion of Precarious Employment, Work Disorganization, and Consequences for Occupational Health: Placing the Debate in a Comparative Historical Context," *International Journal of Health Services* 31, no. 3 (July 1, 2001): 507–36, <https://doi.org/10.2190/22BK-9XC0-AK7L-M6QH>.

³³ Achmad Ridwan Tentowi, T. Subarsyah Sumadikara, and Roely Panggabean, *Politik Hukum Tata Kelola Kepelabuhanan Nasional* (Bandung: CV. Warta Bagja, 2016).

learn from the Philippines' experience in implementing labor skill standards, port modernization, and improving the worker welfare system to improve the performance of stevedoring labor in the Sea Toll program.

2. Factors Affecting the Effectiveness of Stevedores

The stevedore workforce (TKBM) is an important element in the maritime logistics system that determines the smooth distribution of goods at the port. The effectiveness of stevedore workforce greatly affects operational efficiency in the shipping and trade sectors, especially in archipelagic countries such as Indonesia and the Philippines, where sea transportation is the backbone of national connectivity³⁴. Although the two countries have different port systems and labor regulations, there are several key factors that influence the effectiveness of stevedoring labor, including labor regulations, availability of infrastructure and technology, training and certification systems, worker welfare, and cultural and labor management factors.

Regulations governing stevedores play an important role in determining the effectiveness of their work at the port. In Indonesia, stevedores are regulated in several laws and regulations, such as Law Number 17 of 2008 concerning Shipping which regulates legal aspects in the maritime transportation sector, including port workers. In addition, the Decree of the Minister of Transportation Number KM 14 of 2002 concerning the Organization and Business of Loading and Unloading Services from and to Ships regulates the operational procedures for stevedores at Indonesian ports³⁵. However, in its implementation, this regulation still faces challenges in terms of compliance and supervision. Many stevedores in Indonesia still work under a cooperative system that often does not provide optimal work standards. The lack of government supervision of the operations of stevedore cooperatives also leads to less transparent practices in terms of wages and work management, which ultimately affects the effectiveness of their work.

³⁴ Adenantha Lesmana Dewa, Uut Dwi Karningsih, and Retno Mulatsih, "Analisis Pengaruh Peralatan Bongkar Muat, Waktu Tunggu Truck, Kinerja Operator Bongkar Muat, Dan Tenaga Kerja (TKBM) Terhadap Produktivitas Bongkar Muat Batubara Di Pelabuhan Cirebon," *Journal of Business, Finance, and Economics (JBFE)* 2, no. 2 (December 30, 2021): 89–96, <https://doi.org/10.32585/jbfe.v2i2.4591>.

³⁵ Zahry Vandawati Chumaida, "The Implementation Of Unloading Agreements In The Port From Transportation Law Perspectives," *Yuridika* 34, no. 1 (January 1, 2019): 173, <https://doi.org/10.20473/ydk.v34i1.11802>.

In the Philippines, labor regulations in the maritime sector are more structured with the existence of The Philippine Labor Code (Presidential Decree No. 442) which specifically regulates employment, including labor rights in the stevedoring sector. The Philippines also has a certification policy for port workers issued by The Technical Education and Skills Development Authority (TESDA), which ensures that workers in this sector have skills that meet industry standards. With these stricter regulations, the effectiveness of stevedoring workers in the Philippines is better than in Indonesia because the work system is more professional and certification-based. Another major factor that affects the effectiveness of stevedoring workers is the availability of infrastructure and technology at the port. In Indonesia, there are still many ports that are not equipped with modern loading and unloading equipment such as container cranes, forklifts, and automated conveyor systems. This causes much of the work at the port to still be done manually, which reduces labor efficiency. Regulation of the Minister of Transportation Number 92 of 2018 concerning Procedures and Requirements for Granting Approval for the Use of Foreign Vessels also regulates the mechanism for using more modern loading and unloading equipment, but in practice there are still many ports that have not implemented this standard.³⁶

In the Philippines, the application of technology in the loading and unloading system is more advanced than in Indonesia. Several major ports such as the Manila International Container Terminal (MICT) have used an automated cargo handling system that allows loading and unloading to be carried out faster with the help of digital-based technology. This system allows stevedores to work more efficiently because they no longer need to do tasks that can be automated. However, although the Philippines is more advanced in the use of technology than Indonesia, there is still a gap in technology adoption between large and small ports. Several ports in remote areas still experience limited access to modern equipment, which causes differences in the effectiveness of the workforce in various regions ³⁷. This shows that while technology can improve the

³⁶ Yovie Akbar Rona Pratama, "Pengaruh Ketersediaan Alat Bongkar Muat Dan Kapasitas Container Yard Terhadap Kegiatan Operasional Petikemas" (STIA dan Manajemen Kepelabuhan Barunawati, 2024), <http://repository.stiamak.ac.id/id/eprint/575/>.

³⁷ Dani Rusli Utama et al., "Developing a Digital Transformation Maturity Model for Port Assessment in Archipelago Countries: The Indonesian Case," *Transportation Research Interdisciplinary Perspectives* 26 (July 2024): 101146, <https://doi.org/10.1016/j.trip.2024.101146>.

effectiveness of stevedoring labor, without equal infrastructure, the efficiency gap remains a major challenge.

The skill level and certification of stevedores are also factors that determine the effectiveness of their work. In Indonesia, stevedores often work without formal training and only rely on experience in the field. Law Number 13 of 2003 concerning Manpower actually regulates the importance of workforce training, but the implementation of training programs for stevedores is still limited.³⁸

In contrast, in the Philippines, every stevedore is required to undergo training and certification through TESDA, which ensures that they have the skills that are in line with the needs of the industry. The certification program includes training in the use of modern stevedore equipment, occupational safety, and operational efficiency. With a better training system, stevedores in the Philippines are better prepared to face the challenges of the maritime sector compared to workers in Indonesia.

The welfare of workers is an important factor that influences their effectiveness in working. In Indonesia, stevedores often work in less than ideal conditions, with long working hours and low wages. Decree of the Minister of Manpower and Transmigration Number 100 of 2004 concerning Provisions for the Implementation of Fixed-Term Employment Agreements should provide protection for informal sector workers such as stevedores, but in practice, many workers still do not receive their full rights.³⁹

In the Philippines, the wage system is more transparent with the regulation of The Philippine Occupational Safety and Health Standards (OSHS) Act which ensures that every worker in the maritime sector receives a decent wage and occupational safety protection. With a better wage system, workers in the Philippines have higher work motivation compared to workers in Indonesia, who still experience uncertainty in their wage system.⁴⁰

Work culture also affects the effectiveness of stevedoring workers. In Indonesia, the work system is still heavily influenced by a cooperative-based work model, which in

³⁸ Bayu Kurniawan et al., *Manajemen Sumber Daya Manusia* (Bekasi: PT. Kimshafi Alung Cipta, 2023).

³⁹ Arjuna Yusuf Maulana Kubangun et al., "Implementasi Kebijakan Pemerintah Tentang Tenaga Bongkar Muat (TKBM) Dan Peningkatan Kesejahteraan Di Pelabuhan Yos Sudarso Ambon Provinsi Maluku," *Jurnal Ilmiah Global Education* 5, no. 1 (March 26, 2024): 572–86, <https://doi.org/10.55681/jige.v5i1.2393>.

⁴⁰ Raphael Baumler, "Working Time Limits at Sea, a Hundred-Year Construction," *Marine Policy* 121 (November 2020): 1–14, <https://doi.org/10.1016/j.marpol.2020.104101>.

some cases is less effective in managing the workforce. This cooperative system is often less flexible in dealing with changes in technology and regulations, which causes the workforce in Indonesia to be less adaptive to developments in the maritime industry. On the other hand, in the Philippines, the stevedoring work system is more professional with a more structured workforce management system. The use of a technology-based system to organize work schedules and workforce distribution allows ports in the Philippines to have a more efficient workforce in handling the loading and unloading of goods.⁴¹

Based on the analysis, several core factors significantly influence the effectiveness of stevedoring labor in both Indonesia and the Philippines. These include labor regulations, infrastructure and technology availability, training and certification systems, worker welfare, and work culture and workforce management practices. In terms of labor regulations, the Philippines implements a stricter and certification-based legal framework under the Philippine Labor Code and Technical Education and Skills Development Authority (TESDA), ensuring that workers possess standardized competencies. Conversely, in Indonesia, although regulations such as Law No. 17 of 2008 and Law No. 13 of 2003 exist, their enforcement and practical application remain inconsistent.

Regarding infrastructure and technology, the Philippines demonstrates greater readiness, having integrated automated systems like the Cargo Handling Management System (CHMS) and Port Community System (PCS) in most major ports, which streamlines operations. Meanwhile, many Indonesian ports still rely on manual labor and lack advanced equipment, particularly outside Java and Sumatra, despite the existence of modernization directives under Minister of Transportation Regulation No. 92 of 2018. In the area of training and certification, Filipino stevedores undergo formalized programs with measurable outcomes, while Indonesian workers often rely on informal learning, with limited structured training opportunities and inconsistent skill development mechanisms.

When it comes to worker welfare, the Philippines provides stronger legal protections, including more transparent wage systems and access to occupational safety and health programs, as stipulated in the OSHS Act. In contrast, Indonesian stevedores

⁴¹ Adeleida S Mongan, Willy F Pesoth, and Agustinus B Pati, "Budaya Kerja Pegawai Pada Biro Umum Sekretariat Daerah Provinsi Sulawesi Utara," *Jurnal Ilmu Sosial & Pengelolaan Sumberdaya Pembangunan* 1, no. 15 (2015): 1–16, <https://ejournal.unsrat.ac.id/v3/index.php/jurnalilmiahociety/article/view/10365/9952>.

frequently encounter wage uncertainty and minimal social security benefits, even though protective regulations like the Minister of Manpower and Transmigration Decree No. 100 of 2004 are in place. Lastly, in terms of work culture and management, the Philippines employs a more professional, technologically supported labor management model, whereas Indonesia's cooperative-based system is often less adaptive to policy shifts and technological innovation.

Given these contrasts, it is evident that the Philippines has taken a more holistic and structured approach to stevedoring workforce development. Therefore, Indonesia could benefit from adopting select policy strategies from the Philippines, particularly in the areas of training standardization, regulatory enforcement, and technological adoption, to enhance the overall effectiveness of its stevedoring labor within the Sea Toll program.

CONCLUSION

The Philippines has a more efficient stevedoring workforce performance than Indonesia in the Sea Toll program, especially in terms of work efficiency, technology implementation, and worker welfare. The efficiency of stevedoring workers in the Philippines is higher due to strict regulations, such as The Philippine Labor Code (Presidential Decree No. 442), which requires workers to have skills certification, while in Indonesia many ports still rely on manual systems even though it has been regulated in Law Number 17 of 2008 concerning Shipping. In terms of technology, the Philippines has adopted automation systems such as the Cargo Handling Management System (CHMS) and the Port Community System (PCS), which allow for better coordination and faster loading and unloading processes, while in Indonesia there are still many ports that have not implemented full mechanization, although some have begun to adopt digitalization systems in accordance with the Regulation of the Minister of Transportation Number 92 of 2018. In terms of worker welfare, the Philippines has better wage standards and labor protection based on the Philippine Occupational Safety and Health Standards (OSHS) Act, which ensures occupational safety and decent compensation, while in Indonesia stevedores still face wage uncertainty and minimal social protection even though it has been regulated in the Decree of the Minister of Manpower and Transmigration Number 100 of 2004.

The effectiveness of stevedores in Indonesia and the Philippines is influenced by several key factors, including labor regulations, availability of infrastructure and technology, training and certification systems, worker welfare, and work culture and labor management. In terms of regulation, the Philippines has a stricter and certification-based system, as stipulated in The Philippine Labor Code (Presidential Decree No. 442) and TESDA training programs, which ensure that workers have skills that meet industry standards, while in Indonesia, although regulations such as Law No. 17 of 2008 on Shipping have regulated the maritime sector, the implementation of labor skill standards is still not optimal. In terms of infrastructure and technology, the Philippines is superior with the implementation of automation systems such as the Cargo Handling Management System (CHMS) and Port Community System (PCS), which allow digital recording and coordination of loading and unloading, while Indonesia still relies on manual systems in many ports, although some have begun to implement mechanization in accordance with the Regulation of the Minister of Transportation Number 92 of 2018. In terms of welfare, the Philippines has better regulations regarding wages and protection of workers through the Philippine Occupational Safety and Health Standards (OSHS) Act, while in Indonesia, the wage system for stevedores still faces various obstacles, such as uncertainty of work contracts and minimal social protection, even though it has been regulated in the Decree of the Minister of Manpower and Transmigration Number 100 of 2004. In addition, work culture factors also affect the effectiveness of the workforce in both countries, where the cooperative system that is still dominant in Indonesia sometimes hinders flexibility and adaptation to technology, while the Philippines has implemented a more professional technology-based workforce management system.

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