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Research Articles

Implementation of Line 1 Imported Container Fumigation: Logistics Cost Efficiency and National Anti-Corruption Program Support

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Abstract: Import-export activities cannot be separated from the term logistics costs, currently the amount of logistics costs in Indonesia has reached 17%. One of the reasons for the high logistics costs is the level of efficiency and effectiveness of the logistics chain, such as the unavailability of fumigation services in the line 1 port area. With the hope of reducing logistics costs, PT *one single billing system,* This is in accordance with the focus of 1 STRANAS PK which encourages system integration in port services. The implementation of STRANAS PK within the port area is intended to reduce corruption cases triggered by incompatibility between service systems. This research is intended to determine whether the implementation of imported container fumigation services in the line 1 area as a follow-up to STRANAS PK has been implemented and has an effective influence on logistics costs. The method in this research uses a quantitative type, with simple calculations which are reinforced with t-tests by the SPSS version 26 application. This research proves that there are savings that occur in logistics costs amounting to IDR 551,562,000, for 660 40ft imported containers that are fumigated with *Methyl Bromide* 16 mg dose if the fumigation process of imported containers is carried out in the line 1 area, and in the t-test via SPSS a significant value of 0.000 < 0.05 is obtained, meaning that all variables significantly influence the efficiency variable. So it can be concluded that the line 1 cost variables (X1) and line 2 costs (X2) have an influence on the efficiency variable (Y). Fumigation services in the line 1 area are in accordance with STRANAS PK's focus on port governance, and of course have a big impact on effectiveness and efficiency in logistics costs.

Keywords: Cost, Efficiency, Fumigation, National Strategy PK

1. Introduction

The shipping business has a big role in the world trade cycle in meeting needs between countries, trade activities between countries are usually called export-import. Export import is an important element in a country's trade balance [1]. Import-export activities will of course not be separated from the term logistics costs. Logistics costs at Indonesian ports have reached 17% of the total business operational costs, compared to Malaysia which is only 8%, the Philippines 7% and Singapore 6%, then port logistics costs in Indonesia are considered very high [2].

Logistics costs are the main component in export-import activities. High or low logistics costs are influenced by the level of efficiency and effectiveness of the existing logistics chain. One of the factors behind high logistics costs is containers being held in the terminal for too long. Another thing that is the reason for the high logistics costs in Indonesia is the unavailability of fumigation services at line 1 ports. Therefore, efforts are needed to

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reduce logistics costs, so that these efforts are expected to increase Indonesia's competitiveness in the global competition arena as a result of increasingly open markets [3]. Logistics cost efficiency can be achieved by integrating existing services at the port. The system is called *one single billing,* where port service users only pay once to obtain port services including docking, loading and unloading, quarantine, immigration, *trucking* and so on.

One of the important activities at the port quarantine port is fumigation. Fumigation is a standard quarantine measure whose supervision is under the auspices of the Port Health Office (KKP) while its implementation is carried out by private business entities and is carried out in the context of publishing *Ship Sanitation Control Exemption Certificate* (SSCEC) [4]. Fumigation is a standard that can kill pests up to 100 percent. At the time the author was carrying out land practice (prada) at PT This service is intended to increase the competitiveness of the national port and logistics industry, especially because of its contribution to ensuring the security of goods leaving the port. Apart from that, fumigation services are one of the actions of the National Corruption Prevention Strategy, Stranas PK, which is focus 1 (Licensing and Commerce) which encourages system integration in port services.

The implementation of the National Strategy for PK was triggered by an increase in the CPI score in Indonesia. Period 2022 to 2024 *Transparency International* reported that the CPI score (*Corruption Perseption Index*) in Indonesia stagnated at number 34 [5], this was of course followed by a decline in Indonesia's ranking on a global scale, based on the IPK report, Indonesia was at 110th. Therefore, Stranas PK was published, namely the national policy direction which contains the focus and targets for preventing corruption, used as a reference for ministries, institutions, regional governments and other stakeholders in implementing corruption prevention actions in Indonesia. There are 15 (fifteen) corruption prevention actions based on Presidential Regulation Number 54 of 2018 (Article 5), one of which is Improving Governance in Port Areas. This is used as a reference by PT. Surabaya Container Terminal (PT TPS) as a State-Owned Enterprise which operates in the logistics sector, especially port management and development to make efforts to accelerate and increase the efficiency of the flow of goods, so that it will be in line with the government's strategy in efforts to transform ports and optimize state revenues, with the hope of reducing *logistic cost* in Indonesia. So, with the fumigation service at PT XYZ, importers can cut costs *lift on* And *lift off* which previously had to be paid in the Line 2 area so that the fumigation process becomes faster because containers can be fumigation immediately when they are in the Line 1 area

This research is based on the discovery of the high costs that must be incurred by the owner of the goods when a container must be fumigation. Apart from that, the time to complete fumigation in Line 2 is longer than in Line 1. This research focuses on the process

flow of imported container fumigation services in the line 1 area and the effect of implementing these fumigation services on logistics costs.

2. Literature Review or Related Research

2.1 Fumigation

Fumigation is a standard quarantine measure whose supervision is under the auspices of the Port Health Office (KKP) while its implementation is carried out by private business entities and is carried out in the context of issuing a Ship Sanitation Control Exemption Certificate (SSCEC) [4]. According to the KBBI, the term fumigation is a fumigation activity using fumigant gas to remove (destroy) germs and so on [6]. One way to control pests is that the process involves pesticides in gas form, this is called a fumigant. Pesticides in gas form are sprayed or smoked to poison the pests so that the pests will slowly die. The fumigation process is often used in the entry process of exported or imported goods [7].

2.2 Impor

Import is one of the trade activities, namely by bringing goods originating from abroad into the customs area. The aim of import activities is to fulfill domestic needs and activities, as an effort to reduce production costs as well as ownership time, as well as an action to improve the domestic industrial sector.

2.3 Port Warehouse Area

The container stacking warehouse area is divided into 2 types, namely: Line 1 area is located at the edge of the dock and all goods in the line 1 area are under customs supervision. [8]. The line 2 area is located outside the port area, goods in this area are containers that have exceeded the stacking time limit in Line 1 or containers that have obligations that must be fulfilled [8].

2.4 Party PK

The National Strategy for Preventing and Eradicating Corruption is a national policy direction with a focus and target for preventing corruption which is used as a reference for ministries, institutions, government and other stakeholders [9].

2.5 Logistics costs

One of the components of logistics costs is container stacking costs. Container stacking costs are costs that arise due to loading and unloading services by the port in the container terminal port area and are borne by service users [10].

3. Research Method

This research uses a descriptive quantitative method using a simple Excel formula and is assisted by the SPSS version 26 application to carry out a t-test on the influence of the implementation of imported container fumigation services in the line 1 area on logistics cost

efficiency. This research was conducted at PT XYZ Commercial Business Development work unit.

The samples for this research were all 40ft imported containers that underwent fumigation inspection and had a check flag (SPPMP) from the Quarantine Agency which were unloaded through Terminal XX in the Tanjung Perak Port area in the period February 2024 – February 2025.

The data source for this research uses 2 types of data, namely primary data and secondary data. Primary data is a database that is applied in research. The techniques used in collecting primary data are: interviews, surveys, experiments, and so on. Primary data is always specific because it is tailored to the researcher's needs [11]. Primary data from this research was obtained from interviews with parties involved in fumigation services, such as property owners as users of fumigation services and from the service providers themselves as fumigation service operators. Meanwhile, secondary data was obtained from research objects indirectly, data obtained from other parties, namely in the form of monthly report data related to the implementation of imported container fumigation services, and related scientific journals.

Data collection techniques in this research were carried out using three methods. First, interview. Interviews are a method for obtaining primary data directly from research subjects [12]. In this research, the author conducted interviews with parties related to fumigation services, such as property owners as service users and fumigation service operators as service providers. Second, literature study. The method is implemented by reading several collections in the library which are still in accordance with the topic we are discussing [13]. The author also collects data through monthly reports and related company archives. Third, documentation techniques. Apart from interviews and literature studies, the author also uses documentation techniques to obtain data that is relevant to the topic being discussed. Documentation itself is based on the word document, where this technique is a stage or procedure for recording and collecting existing data [14]

This research uses 2 data analysis techniques. First, Partial Test (T Test). To determine the influence of the implementation of imported container fumigation services in the line 1 area on logistics costs in this study, secondary data analysis was used using the T-test statistical method via the SPSS version 26 application. The T-test in this study used a significance level of 0.05. Second, descriptive statistics. The way to find out whether there is an influence of the implementation of fumigation services in the Line 1 area on the efficiency of logistics costs in this research uses descriptive statistical methods, by presenting percentage calculations, presenting data in the form of tables, bar charts, and calculating averages. The data was taken from monthly fumigation service reports, then reviewed by the author from interviews with parties related to fumigation services.

4. Results and Discussion

PT This research used a sample of 660 imported containers measuring 40ft which were fumigated with a 16mg dose of Methyyl Bromide fumigant.

4.1 Results

4.1.1 Partial Test (T test)

The results of this research through SPSS testing regarding the effect of implementing imported container fumigation services in the line 1 area, the significant value is 0.000 <0.05, meaning that all variables significantly influence the efficiency variable. So it can be concluded that the line 1 cost variables (X1) and line 2 costs (X2) have an influence on the efficiency variable (Y). Apart from that, it can also be seen that the line 1 cost variable (X1) has a negative and significant effect on the efficiency variable (Y), meaning that an increase in the value of the independent variable (line 1 costs) will affect a decrease in the value of the dependent variable (efficiency), so that if there is an increase in fumigation service rates in the line 1 area, the efficiency value of logistics costs will also decrease. Meanwhile, the line 2 cost variable (X2) has a positive and significant effect on the efficiency variable (Y).

Descriptive statistics

This research uses the Microsoft Excel application to calculate the amount of logistics cost savings obtained by service users if they carry out fumigation in the line 1 area. The calculation results obtained for fumigation services in the line 1 area for 660 imported 40ft containers with 16mg dose of Methyl Bromide fumigant for both onion and non-onion commodities is IDR 3,497,076,000.00. Meanwhile, the calculation obtained for fumigation services in the line 2 area for 660 40ft imported containers with a 16mg dose of Methyl Bromide fumigant for both onion and non-onion commodities was IDR 4,048,638,000. The next stage is to find the efficiency level between the 2 variables above, so that the efficiency level obtained for 660 40ft imported containers with a 16mg dose of Methyl Bromide fumigant for both onion and non-onion commodities is IDR 551,562,000.

4.2 Discussion

4.2.1 Import Container Fumigation Services in Line 1 Terminal Area

The flow of imported container fumigation services at PT After the service user completes the document processing, the next step is placing the container in the TPK area. Containers that have entered the TPK area will be inspected by quarantine officers, then the officers will order fumigation to be carried out because OTPK (quarantine plant pest organisms) and OPT were found. The next stage after finding the OTPK is the issuance of the SP-4 document by the quarantine officer. Based on this flag, service users are allowed to make job orders for behandle fumigation (BHFI) and select a fumigator company by service users. After all administrative processes have been completed and paid for by the service user, the designated container can be moved to the fumigation area, then the fumigation company fumigates the container according to the type of fumigant and dosage chosen by the service

user. If the fumigation service process has been completed, the next step is the issuance of a fumigation certificate and gas clearance certificate by the fumigation company. So service users do not need to take their containers out to carry out fumigation, because fumigation services can be carried out in the line 1 area of the terminal. At PT XYZ there are 12 registered fumigator companies

4.2.2 Implementation of imported container fumigation services in the line 1 area of the terminal as a follow-up to the Stranas PK program

This research is also in line with the implementation of the National Corruption Prevention Strategy, National Strategy PK focus 1 (Licensing and Commerce) which encourages system integration in port services. With this service, logistics activities become more effective and efficient, because the entire container service process is available in the line 1 terminal area. If services at the port are completely integrated into one line, the logistics costs incurred by service users will be smaller, but if port services are still not integrated with each other, then this can lead to high logistics costs that must be incurred by service users.

The results of the analysis from this research can be seen that in the period February 2024 to February 2025, PT With the existing data, it can also be seen that the amount of logistics costs that service users must incur when carrying out fumigation in the line 1 area is IDR 5,298,600 for a 40ft container that is fumigated with a 16mg dose of Methyl Bromide fumigation agent. For fumigation services in the line 2 area, service users are charged IDR 6,134,300 for a 40ft container that is fumigated with a 16mg dose of Methyl Bromide fumigation agent.

So we can know the overall efficiency of container logistics costs obtained by goods owners if they fumigate containers in the line 1 area, which is IDR 835,700 for each 40ft container that is fumigated with a 16mg dose of Methyl Bromide fumigation agent. The results of this research are in line with research conducted by [15] where it is explained that logistics cost efficiency can be achieved if services at the port can be provided comprehensively.

4.2.3 The effect of implementing imported container fumigation services in the line 1 terminal area on logistics costs

This research shows the influence of the implementation of imported container fumigation services in the line 1 terminal area on logistics costs. This is supported by a table calculating the amount of efficiency for the logistics costs of fumigation of imported containers obtained by service users if they carry out fumigation in the line 1 area. In the 1 year period (February 2024 - February 2025) there was an efficiency in logistics costs of IDR 551,562,000, the calculation results are based on the largest fumigation throughput, namely containers with a size of 40ft which are fumigated with a dose of Methyl Bromide 16mg.

Apart from that, the influence of the implementation of imported container fumigation services in the line 1 area on logistics costs was also proven through a partial test (t-test) using the SPSS version 26 application. The result of this test was a significant value of 0.000 < 0.05,

meaning that all variables significantly influenced the efficiency variable. So it can be concluded that the line 1 cost variables (X1) and line 2 costs (X2) have an influence on the efficiency variable (Y).

The results of interviews with several employees in the Commercial Business Development department, with fumigation in Line 1, the sources stated that this had a significant impact on the overall efficiency of container logistics costs from unloading to distribution to the cargo owner's warehouse.

5. Conclusion

The results of the research carried out by the author are intended to answer the problem formulation that was previously presented. So that the results were obtained in the form of answers to the problem formulation from the research with the title "Implementation of Imported Container Fumigation Services in the Line 1 Terminal Area as a Follow-up to the National Strategy Program for Eradicating Corruption (Stranas Pk) and its Effect on Container Logistics Costs", so that the following conclusions were obtained:

It is known that the imported container fumigation service in the line 1 area of the PT XYZ terminal collaborates with 12 fumigator companies. The agreed company must register its company before carrying out and using the service.

This research shows that the import container fumigation service in the line 1 area in the implementation process is in accordance with the National Strategy for Corruption Prevention, Stranas PK focus 1 (Licensing and Commerce) which encourages system integration in port services which aims to reduce logistics costs in Indonesia.

In this research it can also be concluded that imported container fumigation services in the line 1 area have an influence on logistics costs. This is proven through the SPSS version 26 test that the significant value is $0.000 < 0.05$, meaning that the line 1 cost variable (X1) has a negative and significant effect on the efficiency variable (Y), meaning that an increase in the value of the independent variable (line 1 costs) will affect a decrease in the value of the dependent variable (efficiency), so that if there is an increase in fumigation service rates in the line 1 area, the efficiency value of logistics costs will also decrease. So it can be concluded that the variable cost of line 1 (X1) is more efficient than line 2, so that service users get benefits if they carry out imported container fumigation services in the line 1 area.

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