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Analysis of the performance evaluation of the logistics express liner port on the T-14 Tanjung Perak – Larantuka – Lewoleba – Kalabahi route in reducing price disparity

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Abstract

The Express Liner program also known in Indonesia as “Tol Laut”, initiated in 2015, aimed to reduce price disparities between Java and eastern Indonesian regions by providing regular and sustainable shipping services to remote areas. However, after seven years, the program has not significantly affected price disparities in eastern Indonesia. To evaluate the program's effectiveness, this study examined port performance and economic changes resulting from Express Liner. The study identified areas of improvement for Larantuka, Lewoleba, and Kalabahi ports, such as docks, terminals, access roads, and storage facilities. Port performance evaluation revealed that Larantuka Port had subpar utilization of docks and stacking fields, while Lewoleba Port exhibited poor dock usage. Kalabahi Port, on the other hand, demonstrated good performance in dock utilization and stacking field usage. Regarding ship services, Larantuka Port showed good waiting time performance but poor loading and unloading productivity and ship effectiveness. Lewoleba Port had unfavorable waiting time in 2021 but improved in 2022, while its loading and unloading productivity and effectiveness were poor in both years. Kalabahi Port demonstrated good waiting time and effectiveness, but its loading and unloading productivity fell short of the standard. Evaluating the economic impact, the Express Liner program did not significantly reduce the prices of necessities. Certain commodities experienced price increases influenced by regional distances and price fluctuations in Surabaya. However, medium rice prices decreased significantly in Larantuka and Kalabahi, indicating a positive impact of the Express Liner program in those areas.

Keywords

Express liner, price disparity, evaluation, port performance, consumer price index

INTRODUCTION

The Express Liner Program also known in Indonesia as “Tol Laut” is a program that was inaugurated on November 4th, 2015, by the Minister of Transportation, the Coordinating Minister for Maritime Affairs and Resources, and the Minister of Trade [1]. The program is a solution provided by the government to reduce price disparities that occur between the island of Java and other areas in eastern Indonesia. The Express Liner aims to reach and distribute logistics to underdeveloped, remote, outermost and border areas as well as to ensure the availability of goods and reduce price disparities with regular, planned, and sustainable ship services. In principle, the Express Liner is the operation of sea transportation on a regular and regular basis that connects hub ports along with feeders from Sumatra to Papua using large ships so that economic benefits are obtained [2].

In increasing the effectiveness of the implementation of the Express Liner program in supporting the distribution of goods and economic development in the 3TP area and in an effort to reduce price disparities between Western Indonesia and Eastern Indonesia, in 2015 the government established 6 (six) route networks (Ministry of Transportation, 2020). Operation of 6 Express Liner ship routes with 3 base ports and 40 stopover ports, 13 routes in 2017 with 3 base ports and 40 stopover ports, in 2018 with 18 routes with 3 transhipment ports, 3 base ports and 55 stopover ports, 20 routes in in 2019 with 5 transhipment ports, 4 base ports and 72 stopover ports and in 2020 there are 25 routes with 6 transhipment ports, 3 base ports and 100 stopover ports, in 2022 the Express Liner routes increase to 34 routes and operate 32 ships that stop at 114 Ports include the Provinces of Papua and West Papua. And in the eighth year that the program is running, the Express Liner routes have increased to 39 routes with details of the assignment of 20 routes (PT. PELNI = 11 routes, PT. ASDP = 5 routes and PT. Djakarta Lloyd = 4 routes) and public auctions to private operators = 19 [3].

According to the Ministry of Transportation, the Express Liner is not considered capable of having a significant impact on the national economy, especially in reducing price disparities. This is evidenced by the significant gap in the price of staple goods [4]. Price disparity is a situation where there is a large price difference or imbalance in the price of certain staples between regions. Disparity is a common thing in an area [5]. The Directorate General of Sea Transportation of the

Ministry of Transportation stated that another obstacle was the lack of return loading from each route in areas with low economy, causing the waiting time for ships at the port to reach 1-2 days so that the costs required would be even greater [6]. The volume of cargo transported and the cargo behind the ships of the Express Liner is presented in Figure 1.

Logistik Nusantara 1 ship with a shipping frequency of once every 19 days to carry out assignments in maintaining connectivity and carrying out the task of carrying cargo to East Nusa Tenggara (NTT).

NTT relies on sea transportation as the main mode of transportation for passenger and goods transport. There are 74 ports connecting the islands in NTT, with the aim of

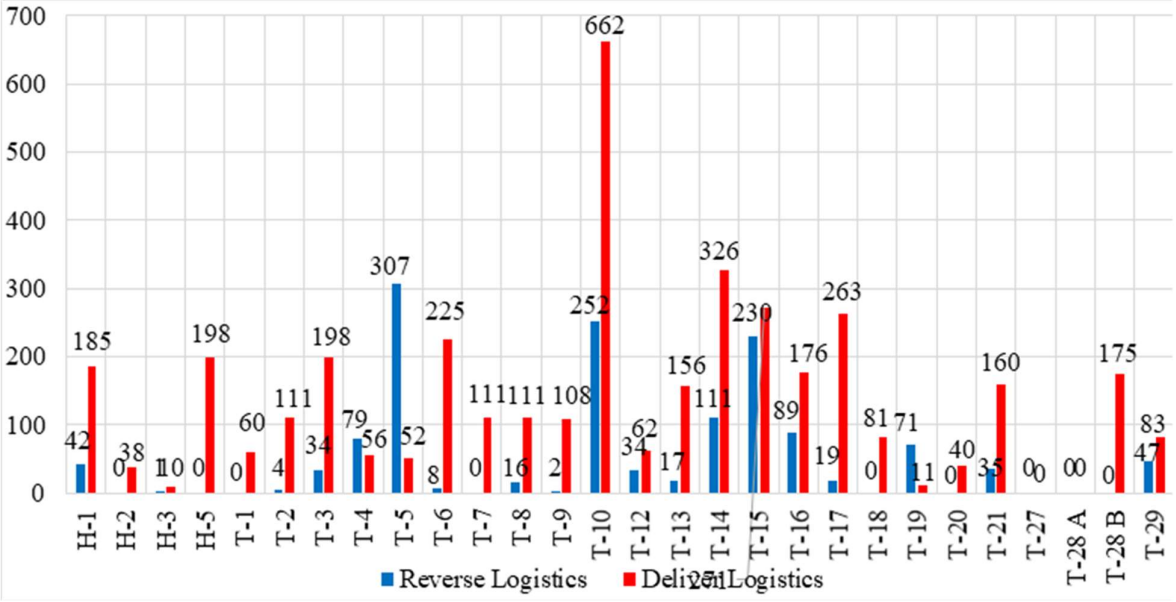

Figure 1 The cargo volume of express liner ships for the April 2022 period

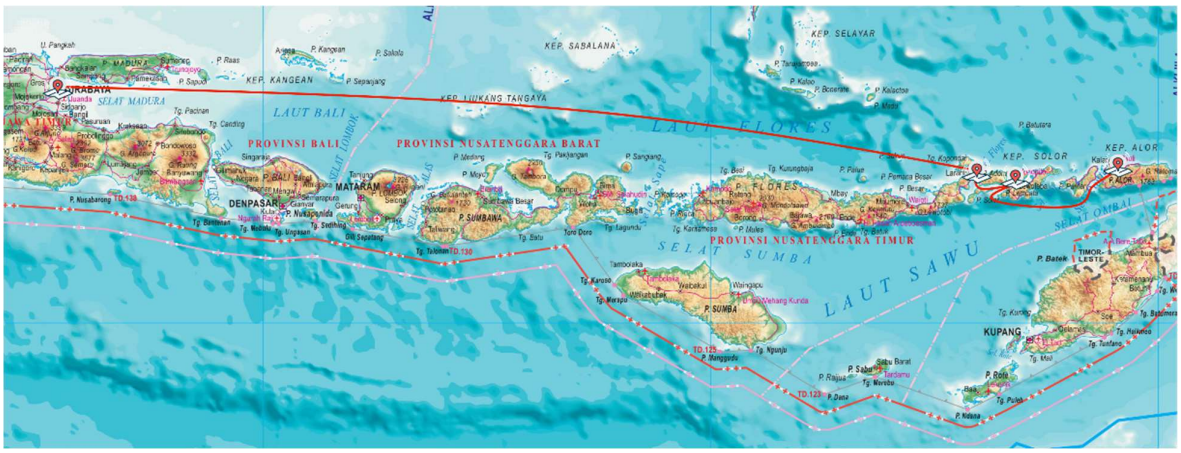

Figure 2 Map of the T-14 express liner road route in 2022

The T-14 Express Liner route is one of the Express Liner routes that serves the transportation of commodities to East Nusa Tenggara with the Tanjung Perak (Surabaya) – Larantuka (East Flores) – Lewoleba (Lembata) – Kalabahi (Alor) – Tanjung Perak (Surabaya) shipping route), this route has a total length of 1537 nautical miles. As is known, Tanjung Perak Port is the second largest port in Indonesia which is very potential in supporting the flow of goods to and from the eastern part of Indonesia [7] and in fact currently Tanjung Perak is also one of the gateway ports of eastern Indonesia, becoming a center for collectors and distributors of goods to the Eastern Region of Indonesia [8]. The T-14 route itself was given a mandate by the Government to PT. PELNI is the operator of the route and in 2022 it will be sailed by KM Kendhaga Nusantara 7 which was previously sailed by the KM

driving the local economy and reducing price disparities. One of them is the Port of Larantuka, which is located in East Flores Regency on the island of Flores, is the only means of sea transportation that connects with other ports inside and outside NTT, such as Timor Island, Lombok Island (West Nusa Tenggara), Sulawesi Island, and Java Island. Likewise, with Lewoleba Port in Lembata Regency and Kalabahi Port in Alor Regency, both of which play a role as a liaison and development center, mobilizing people, goods and services. One important factor for port down time in East Nusa Tenggara is wave condition. Wave condition in East Indonesia is determined by monsoon season [9]. However, the three ports face challenges in carrying out goods transportation services or the Express Liner program. The performance of each port affects the performance of the Express Liner program as a whole.

Nevertheless, the Ports of Larantuka, Lewoleba, and Kalabahi are experiencing developments both physically and functionally. The three ports are trusted by the Ministry of Transportation to run the Express Liner program and have become a transit point for container ships in recent years. The Ministry of Trade's Maritime Highway and Maritime Outlet Program has increased the productivity and distribution of goods at these ports.

However, the three ports are still facing problems in meeting demand for staple goods and increasing productivity. The lack of port facilities causes ship delays, has an impact on higher commodity prices, and has an impact on the length of time for loading and unloading services.

The low productivity of equipment at the port has an impact on the length of time containers stay at the container terminal, which results in higher costs for service users. In order to improve port performance and improve services, it is necessary to invest in the construction of adequate port facilities and good maintenance.

The service performance in question has eight indicators that become a benchmark for the standard value of port operational service performance. The nine indicators consist of Waiting Time (WT), Berthing Time (BT), Effectiveness, Work Productivity (B/S/H), Container Receiving/Delivery, Berth Occupancy Ratio (BOR), Shed Occupancy Ratio (SOR), and Yard Occupancy Ratio (YOR). Operational service performance standards are standards of the work of each service that must be achieved by terminal or port operators in the implementation of port services, including the provision of port facilities and equipment [10].

The ship's service time at the dock will be related to many things. Some conditions that can be examined include BT (Berth Time) which is the pond time from the time the rope is tied to the rope is released, BWT (Berth Working Time) which is the time the ship starts work until the ship finishes work, IT (Idle Time) which is ineffective or unproductive time or wasted while the ship is moored due to the influence of weather and damaged loading and unloading equipment, NOT (Not Operation Time) is the pause time, stopping time, which is planned during the ship at the port (preparation for loading and unloading and work breaks), ET (Effective Time) is the amount of effective time used to carry out loading and unloading activities during the ship mooring [11].

Berthing time consists of BWT + NOT. Berth Working Time (BWT) is the time for loading and unloading activities while the ship is at the dock, which consists of Effective Time (ET) and Idle Time (IT). Not Operation Time (NOT) is a pause time, a planned stopping time during the Ship in Port (preparation of b/m and work breaks). Idle Time (IT) is ineffective or unproductive time or wasted while the ship is moored due to the influence of weather and damaged loading and unloading equipment [12]. To find out the ship mooring time / berthing time there are 2 standards that must be measured, namely Productivity (B/S/H) and ET:BT. Box per ship per hour (B/S/H) is the number of containers that can be unloaded and/or loaded by the terminal on a ship at the dock within an hourly time. This indicator is more intended for shipping companies, because the higher the B/S/H value, the shorter the service time [13]. The effectiveness value (ET: BT) which is the ratio between effective time (ET) and berthing time (BT) which is an indicator of services related to mooring services. Effective time (ET) is the number of hours a ship actually uses for loading and unloading while the ship is moored or at dock. Berthing time (BT) is the time ready to dock to service the ship in a few hours. ET/BT is expressed in units of % (percent) [14].

Productivity (B/S/H) and ET:BT are indicators of goods service performance and ship service performance. These two performance indicators represent effectiveness and efficiency. Productivity (B/S/H) is the number of containers that can be unloaded or loaded in one hour by each work aisle, while ET:BT is the percentage of time actually spent loading and unloading. So it has a relationship with effective working time. The higher the B/S/H value, the more effective the loading and unloading, and the higher the ET:BT, the more efficient the loading and unloading [15].

Port operational service performance standards are standards used to assess the achievement of the performance of a Port based on the Decree of the Director General of Sea Transportation Number: UM.002/38/18/DTM.11 concerning Port Operational Service Performance Standards of the Director General of Sea Transportation. Article 4 states that the standard performance of ship and goods operational services [16].

RESEARCH SIGNIFICANCE

This study aims to evaluate the condition of Express Liner ports before and after the Express Liner program is running, as well as evaluate the performance of Express Liner ports in terms of utility facilities at the port. In addition, the purpose of this study also includes evaluating the performance of Express Liner ports in terms of Express Liner ship services at the docks, as well as the effectiveness and productivity of loading and unloading of Express Liner ships at the docks. This study also aims to evaluate the Express Liner program from an economic perspective, by comparing the value of the Consumer Price Index (CPI) for staple goods.

METHODOLOGY

A. DATA COLLECTION

The data needed for this study consists of primary data and secondary data. Primary data is data collected directly in the field, while secondary data in the work on this study was obtained from the literature and relevant agencies.

1. Primary Data
   Primary data is a source of research data obtained directly by conducting interviews with representatives from PT. PELINDO (Persero) East Nusa Tenggara Regional, Larantuka, Lewoleba, and Kalabahi Port Administration Unit Offices, and the Department of Industry and Trade regarding the facilities available at the Port, the disparity conditions that occur in the field, and the performance of the Port in general.
2. Secondary Data
   In compiling this study secondary data is needed as supporting data from an analysis. Secondary data in writing this study were obtained from the existing coniditon in the field. Secondary data required include:

a. Port Layout
b. Port Facilities and Infrastructure Data
c. Existing Capacity of Facility Data
d. Ship Formation Data
e. Vessel Payload Data
f. Goods Flow Data
g. Commodity Price Data
h. Related Previous Research

B. DATA ANALYSIS

In this study, the survey locations chosen were Larantuka Port, Lewoleba Port, and Kalabahi Port. The main reason for choosing these three ports as research locations is because the three ports which are service areas for the T-14 Express Liner route are still experiencing differences in prices of basic necessities with the city of Surabaya and the condition and performance of ports that are different from Tanjung Perak Port.

In the data analysis, it will be evaluated how to compare the condition of the pier at the port before and after the implementation of the Express Liner program. Therefore, data is needed as a utility to be compared, such as the length of the shipping channel, transport capacity, cargo handling at the Port, and the facilities at the wharf. These data will be obtained through secondary data and also interviews from the relevant Port Operations Unit Office or the Harbormaster Office of the Ministry of Transportation and PT. PELINDO.

In the evaluation analysis of the Express Liner program from the facility utility review, it is first necessary to know the cycle on the use of facilities by Express Liner ships. After all the necessary data has been obtained, it can be continued with the calculation of facility utilities consisting of the calculation of:

- Berth Occupancy Ratio (BOR) :

$$BOR = \frac{\sum LOA + Clearance * Berthtime}{EffectiveTime * LengthOfThePier} * 100\% \quad (1)$$

- Yard Occupancy Ratio (YOR) :

$$YOR = \frac{NumberOfShipContainers * DwellingTime}{EffectiveFieldCapacity(ton) * tier * day} * 100\% \quad (2)$$

- Shed Occupancy Ratio (SOR) :

$$SOR = \frac{Total \frac{ton}{m^3} * AverageOfLongStacking}{EffectiveStackingCapacity(ton) * Period} * 100\% \quad (3)$$

In the evaluation analysis of the Express Liner program from the review of ship effectiveness and productivity, it is necessary to begin with data collection in the form of Port layout, Port facilities and infrastructure data, and ship formation data (number of ships stopping, ship service time at the dock, ship productivity while at the dock). After that, proceed with the calculation and analysis of data on the effectiveness and productivity of ships at the dock using quantitative descriptive analysis methods.

In the process of working on the analysis of the evaluation of the Express Liner program from the economic review, it is carried out in several stages, namely the need to identify the current problem, namely the price disparity that still occurs in the implementation of the Express Liner program. Furthermore, data collection is carried out using indirect (secondary) data collection methods. The data required is information on the price of basic commodities. Price data – commodity prices that experience disparity are then processed and calculated the amount of the Consumer Price Index Value (CPI).

- Consumer Price Index Value (CPI):

$$CPI_{nYear} = \left(\left(\frac{P_n}{P_0} \right) x100\% \right) \quad (4)$$

RESULTS AND DISCUSSIONS

A. REVIEW AND SURVEY RESULTS

The Express Liner route with route code T-14 is a route based at the Port of Tanjung Perak with the service route for the Port of Tanjung Perak - Port of Larantuka - Port of Lewoleba - Port of Kalabahi - Port of Tanjung Perak. This route has 1,537 nautical miles or the equivalent of 2,846,524 Km according to Figure 2. Overview of the survey taken in this study, some of them are the specifications of Express Liner ships, Express Liner service areas, and Express Liner Operational Patterns. With a multiport operating pattern, the ship will only move from port to base and then return to the base port without using one of the destination ports to become a feeder port so that the ship's shipping channel becomes from Tanjung Perak - Larantuka - Lewoleba - Kalabahi - Tanjung according to Table 1.

Table 1 Details of shipping mileage on route T-14 [17]

D/O Nautical Miles (Nm)	Tg. Perak	Larantuka	Lewoleba	Kalabahi
Tanjung Perak	0	669	701	745
Larantuka	669	0	32	713
Lewoleba	701	32	0	44
Kalabahi	745	713	44	0

In addition, for shipping containers to East Nusa Tenggara Province or to the T-14 route service area, people are currently using KM ships. UMSINI and KM. AWU which is operated by PT. PELNI. The following is a comparison of ship ticket fares from Surabaya to the T-14 route service area (Larantuka, Lewoleba, and Kalabahi) before and after the Express Liner runs in NTT Province in Table 2 as follows.

Table 2 Container shipping rates from Surabaya to Larantuka, Lewoleba, and Kalabahi before and after the express liner [18]

N	Route	Operator	Ship	Ticket Price (Rp)	
				Before Express Liner -2017	After Express Liner -2021
1	Surabaya – Larantuka	PT. PELNI	KM. Umsini	5,086,500	7,417,317
2	Surabaya – Lewoleba	PT. PELNI	KM. Umsini	5,206,500	7,332,317
3	Surabaya – Kalabahi	PT. PELNI	KM. Awu	3,579,000	5,564,140

Meanwhile, from the survey results obtained by interviewing each port administration unit office, several answers were obtained which are described in Table 3. After that, there are several main survey reviews, one of

Table 3 Situation facts in the field

N	Situation Facts in the Field
1	According to the Sea Traffic Officer of the Port of Larantuka Operational Unit Office, the Express Liner has not been able to reduce the price of basic commodities in the market
2	The Port of Larantuka and Port of Lewoleba do not have warehouses so that the basic goods that arrive must be collected by the sellers/business actors themselves.
3	According to the Sea Traffic Officer of the Lewoleba Class III Port Operations Unit Office, prices for basic commodities are still high because large business actors use the vehicles they have to pick up goods directly at the port and then resell them at a higher price.
4	According to Sea Traffic officers at each port, the frequency of arrival of Express Liner cargo ships is more than private cargo ships, which only once a month.
5	Express Liner ship. KM. Kendhaga Nusantara 7 replaces the KM ship. Nusantara Logistics 1.
6	According to the Port of Larantuka Administration Unit SEA TRAFFIC officer, the public prefers to use Express Liner ships because the fare for Express Liner ships is cheaper than private boats.
7	According to the Sea Traffic Officer of the Lewoleba Class III Port Operations Unit Office, the facilities at Port of Lewoleba have not been able to keep up with the large number of berthed ship activities and loading and unloading activities.
8	According to the Sea Traffic Officer of Lewoleba Class III Port Operations Unit Office, Port of Lewoleba is the busiest port in East Nusa Tenggara, but it is not comparable with the facilities and infrastructure owned such as inadequate size of the pier, there are parts of the pier that have been cracked and destroyed, lack of lighting, an abandoned terminal building, and a damaged guardrail.
9	According to the Sea Traffic Officer of the Port of Larantuka Operational Unit Office, the lack of synergy from the Regional Government agencies and the Industry and Trade Office is related to the still high prices of basic commodities on the market. The local government is not socializing enough about the Express Liner and the local Department of Industry and Trade is not monitoring what commodities must be provided and monitoring price increases.
10	According to the Sea Traffic Officer of the Port of Larantuka Operations Unit Office, limited information and signals in the regions have prevented business actors from using the SITOLAUT application to sell and distribute their produce, so they have to use third parties and commodity prices become more expensive.
11	According to the Sea Traffic Officer of the Lewoleba Class III Port Operations Unit Office, the KM. Logistics Nusantara 1 has a size that is too large for the docks of Port of Larantuka and Port of Lewoleba so it is replaced with KM. Kendhaga Nusantara 7.
12	According to the Administrative Staff of the Harbormaster Office and Class IV Port of Kalabahi Authority, the passenger Express Liner road has had a very positive impact on the people of Kalabahi while the logistics Express Liner road has not had a significant impact.
13	According to the administrative staff of the Harbormaster Office and Class IV Port of Kalabahi Authority, the distribution of goods to Kalabahi is a major problem because crops from the community are not stored in port warehouses but instead use warehouses from outside business actors and then distributed to markets, this causes the price of basic goods soared due to the cost of using the warehouse.
14	According to the Administrative staff of the Harbormaster Office and Class IV Port of Kalabahi Authority, the monopoly that still exists in market trade in Kalabahi and the presence of third parties means that the prices of basic goods do not match the predetermined subsidy standards.
15	According to Sea Traffic officers at the Port of Larantuka Operational Unit Office, the local regional government has not provided socialization on how to use the Express Liner ship system for transporting goods and what the benefits are.
16	According to the administrative staff of the Harbormaster Office and Class IV Port of Kalabahi Authority, entrepreneurs in Kalabahi have not used the Express Liner road so that some prices for basic goods are not in accordance with the standard subsidies that have been given.
17	According to the Trade Development staff of the Department of Industry and Trade of East Nusa Tenggara, prices for staple goods at distributors were still in accordance with the existing integrity pact but when they went directly to the market the commodity prices were immediately changed to be higher.

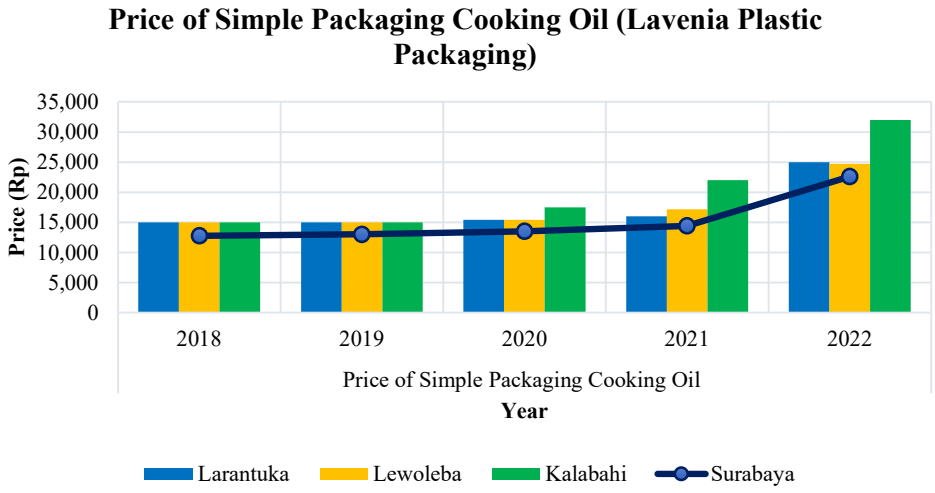

Figure 3 Graph of simple package cooking oil prices in the T-14 express liner route

basic commodities in the market. To find out the effect of the Express Liner on the price of basic commodities in the market, it is necessary to recapitulate commodity price data for the last five years and compare their fluctuations. The following is an example of data on basic goods prices for simple packaged cooking oil taken from 2018 – 2022 which is presented in Figure 3.

In addition to the primary data presented above, some secondary data was collected for this study including Ship Size and Weight Data, Ship Arrival Schedule Data, goods and passenger flow data, and basic needs price data.

B. EVALUATION OF THE CONDITION OF THE SEA PORT OF THE HIGHWAY

In this study the condition of the pier will be evaluated based on the existing facilities obtained, there are several notes that need to be evaluated such as the availability of these facilities from before the existence of the Express Liner and after the Express Liner was in progress and the condition of these facilities so that the facilities that are still available at the facilities so that the facilities that are still available at the port can be identified and how conditions of the facility. The method used is to recapitulate facilities at the port, namely basic facilities, supporting facilities, container facilities, general cargo facilities, loading and unloading facilities, functional port facilities, and loading and unloading workers (TKBM) and then compare the availability of these facilities from before. the Express Liner and after the Express Liner runs and recap the existing conditions of the facility.

B.1. EVALUATION OF CONDITIONS OF PORT OF LARANTUKA

The port in carrying out its main duties is supported by port facilities in accordance with the class or type of port. This port facility is divided into two parts, namely the main facilities and supporting facilities which are classified according to their importance to the port activities themselves [19]. To find out the current condition of the Larantuka Port, it is necessary to know how the condition of the Larantuka Port is described. The Larantuka Port Layout is presented in Figure 4.

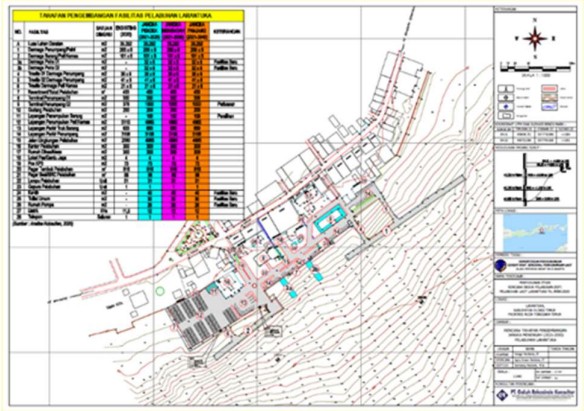

Figure 4 Existing layout of Port of Larantuka [20]

In the existing conditions of Port of Larantuka, out of 9 items in the main port facilities there are only 7 items owned by Port of Larantuka with the facilities that need repair are the wharf and trestle. For port support facilities, all of the 11 items in the supporting facilities of Port of Larantuka have all of them with a note that several facilities that need improvement are the stacking yard, passenger terminal 1, and roads. Next, for 9 items of port container facilities, Port of Larantuka only has 2 items, namely head trucks and tanks, both of which are in good condition. At the port general cargo facility, Port of Larantuka only has 2 items, namely forklifts and tronton trucks, both of which are in good condition. For port loading and unloading facilities, out of the 7 items in Port of Larantuka, only 1 item is ship nets and is in good condition. In the loading and unloading workforce (TKBM) section, Port of Larantuka has 15 TKBM people who are ready when the ship will carry out loading and unloading activities. Then in port functional facilities, of the 17 items that exist Port of Larantuka has 14 items with several notes such as several facilities that need improvement, namely the mainland work area, guardhouse, KPPP Post, parking lot, port complex road, wall fence, and heap.

B.2. EVALUATION OF CONDITIONS OF PORT OF LEWOLEBA

To find out the current condition of Port of Lewoleba, it is necessary to know how the condition of Port of Lewoleba is described. The Lewoleba Port Layout is presented in Figure 5.

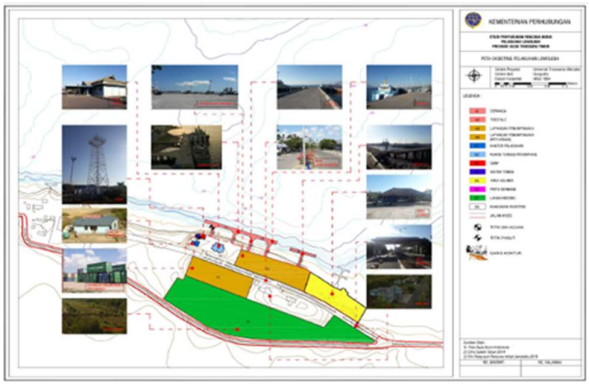

Figure 5 Existing layout of Port of Lewoleba [21]

In the existing condition of Port of Lewoleba, out of 15 items in the main port facilities there are only 12 items owned by Port of Lewoleba with the facilities that need repair are Pier, pier 3, jetty 1, 2, trestle 1, 2, 3, 4, and trestle. For port support facilities, of the 5 items in the Port of Lewoleba supporting facilities, there are 4 items with a note that the facility that needs repair is the passenger waiting room. Next, for 10 items of port container facilities, Port of Lewoleba only has 2 items, namely head trucks and container depots where both are in good condition. At the port general cargo facility, Port of Lewoleba only has 3 items out of 8 items namely passenger ladders, forklifts and tronton truck where all three are in good condition.

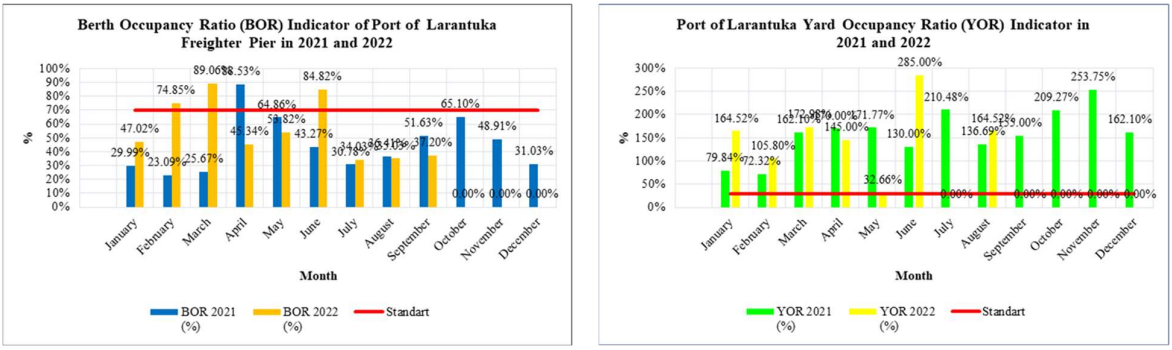

Figure 7 Berth occupancy ratio and yard occupancy ratio of Port of Larantuka in 2021 and 2022

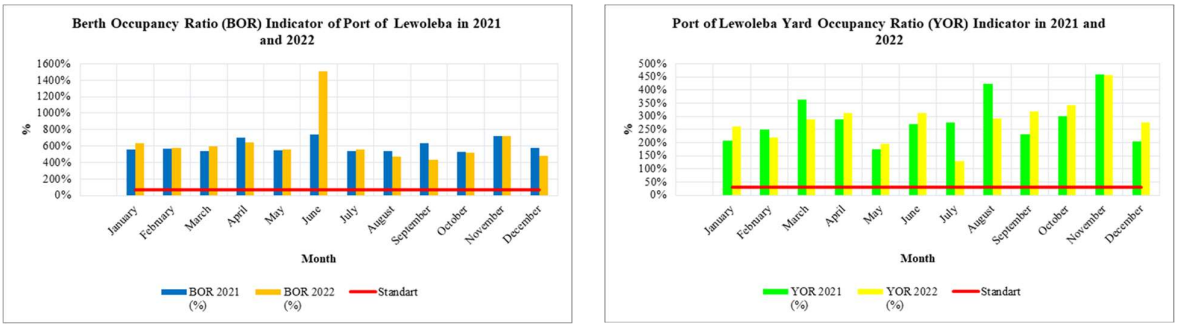

Figure 8 Berth occupancy ratio and yard occupancy ratio of Port of Lewoleba in 2021 and 2022

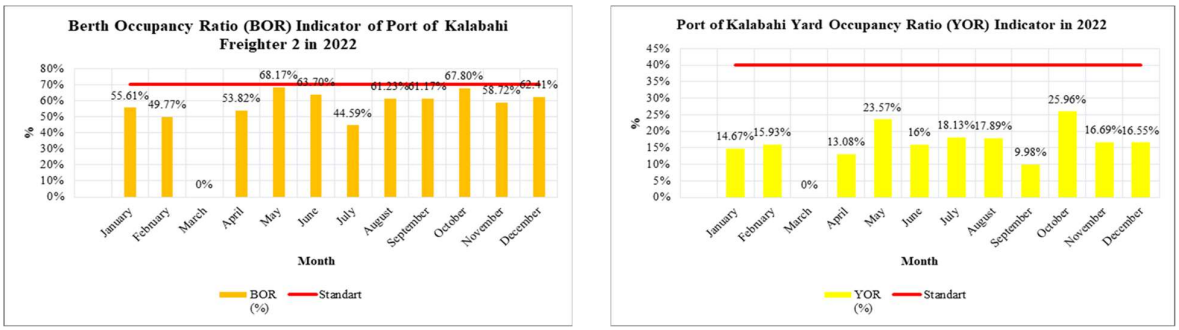

Figure 9 Berth occupancy ratio and yard occupancy ratio of Port of Kalabahi in 2021 and 2022

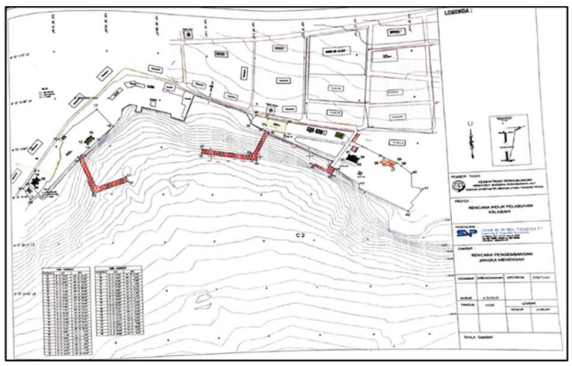

Figure 6 Existing layout of Port of Kalabahi [22]

For port loading and unloading facilities, of the 7 items that exist, Port of Lewoleba does not have all of the existing items. In the loading and unloading workforce (TKBM) section, Port of Lewoleba has 163 TKBM people who are divided into 4 groups to carry out loading and unloading activities. Then in port functional facilities, of the 15 existing items Port of Lewoleba has all existing items with several notes such as several facilities that need repair, namely port fences and port lights.

B.3. EVALUATION OF CONDITIONS OF PORT OF KALABAHI

To find out the current condition of Port of Kalabahi, it is necessary to know how the condition of the Port of Kalabahi is described. Layout of the Port of Kalabahi is presented in Figure 4. In the existing conditions of the Port of Kalabahi, out of 11 items in the main port facilities there are only 9 items owned by the Port of Kalabahi with all in good condition. For port support facilities, of the 4 items in the Port of Kalabahi supporting facilities, all items with a note that the facility that needs repair is a warehouse. Next, on the 8 items of port container facilities, the Port of Kalabahi does not have all of them.

At the general cargo port facility, Port of Kalabahi only has 2 items out of 7 items, namely barges and fire extinguishers, both of which are in good condition. For port

loading and unloading facilities, of the 7 items in port of Kalabahi, 4 items are all in good condition. In the loading and unloading workforce (TKBM) section, Port of Kalabahi has 150 TKBM people who are divided into 3 teams in carrying out loading and unloading activities. Then in port functional facilities, of the 12 items that exist, Port of Kalabahi has 10 items where all are in good condition. Finally, for the 7 other facility items at the port, there is 1 item owned by the Port of Kalabahi, namely a patrol boat with a note that the facility that needs to be repaired is a survey ship.

C. EVALUATION OF THE PERFORMANCE OF EXPRESS LINER PORTS FROM OVERVIEW OF PORT UTILITY FACILITIES

The Port of Larantuka dock (BOR) in 2021 experienced a dominant performance based on the BOR value each month with the highest BOR value in April with a value of 88.53%, which is far above the Port Operational Service Performance Standard based on the Director General of Sea Transportation Number UM.002/38/18/DJPL-11 dated December 15, 2011, which is 70% so that the performance of the pier was declared poor and the lowest BOR value was in February with a value of 23.09% below 70% so that the performance of the dock was declared good.

In 2022, the realization of the Port of Larantuka dock (BOR) in 2022 showed inconsistent performance based on the monthly BOR value, but due to incomplete secondary data, the analysis results became less valid. The highest BOR value was found in March with a value of 89.06% which was far above the Port Operational Service Performance Standard based on the Director General of Sea Transportation Number UM.002/38/18/DJPL-11 dated December 15, 2011 which was 70% so that the dock performance was declared less good and the lowest BOR value was found in September with a value of 3.19% where the value reached below the set performance standard value so that it was declared good.

Meanwhile, the Yard Occupancy Ratio (YOR) shows high performance based on the monthly YOR value. The highest YOR value was recorded in November at 253.75%, far exceeding the standard performance of the dumping field which was set at 30%, so that the performance of the dumping field was stated to be poor. However, the lowest YOR value was recorded in February at 72.32%, above the set performance standard, so it was categorized as not good.

For 2022, the YOR realization value for Port of Larantuka cannot be generated in its entirety due to a lack of secondary data, so the analysis results are not valid. However, the trend shows a decline in performance based on monthly YOR values. The highest YOR value was recorded in June at 285.00%, far exceeding the standard performance of the dumping field which was set at 30%, so that the performance of the dumping field was stated to be poor. Meanwhile, the lowest YOR value was recorded in May of 32.66%, at 0-10% of the standard operational performance, so it is categorized as quite good. As for the use of the stacking yard at the Port of Larantuka, it was stated that it was not good enough.

From Figure 7, In 2021 the realization of the Port of Lewoleba dock (BOR) in 2021 shows poor performance based on the BOR value every month with the highest BOR value in June with a value of 735.73%, which is far above the Port Operational Service Performance Standard based on the Director General of Sea Transportation Number UM.002/38/18/DJPL-11 dated December 15, 2011, which is 70% so that The performance of the pier was declared poor and the lowest BOR value was in October with a BOR value of 533.15% which reached above 70% so that the performance of the dock in that year was declared not good. In 2022, the realization of the dock performance (BOR) of Port of Lewoleba shows a fairly high BOR value based on the BOR value every month. The highest BOR value was found in June with a BOR value of 1513.30% which was far above the Port Operational Service Performance Standard based on the Director General of Sea Transportation Number UM.002/38/18/DJPL-11 dated December 15, 2011 which was 70% so that the dock performance was declared unfavorable and the lowest BOR value was found in September with a BOR value of 429.25% where the value reached above 70% of the set performance standard value so that it was stated The performance of the dock is not good.

Port of Lewoleba is the busiest port in East Nusa Tenggara for loading and unloading services for goods and passengers. This can be supported by the high realized value of Yard Occupancy Ratio (YOR) at Port of Lewoleba. The 2021 YOR value chart shows high performance based on the monthly YOR value, with the highest YOR value recorded in November of 458.75%, far exceeding the port performance standard set at 30%. However, the lowest YOR value was recorded in May at 174.19%, still above the set performance standard.

In 2022, the YOR realization value for Port of Lewoleba also shows a high level based on the monthly YOR value. The highest YOR value was recorded in November at 455.00%, far exceeding the port performance standard set at 30%. However, the lowest YOR value was recorded in July at 129.44%, still above the set performance standard.

Even though Port of Lewoleba has a high level of productivity for loading and unloading of goods every year, the facilities owned by the port are not comparable to this level of productivity. This has an impact on the performance and utilization of port facilities in the future. As for the use of the stacking yard at Port of Lewoleba, it is categorized as unfavorable.

The Port of Kalabahi has warehouse facilities provided by PELINDO Regional III Kalabahi, but it is not used because the container unloading process has been operated in a containerized manner. Therefore, the Shed Occupancy Ratio (SOR) value is considered to be 0%, and only the Berth Occupancy Ratio (BOR) and Yard Occupancy Ratio (YOR) are calculated.

From Figure 8, the graph of the Berth Occupancy Ratio (BOR) value of pier 2 of Port of Kalabahi in 2022 shows consistent performance increasing based on the monthly BOR value. The highest BOR value was recorded in May at 68.17%, still below the operational performance standard set at 70%. Meanwhile the lowest BOR value was recorded in July at 44.59%, also below the operational performance standard. Thus, the performance of the pier in that year can be said to be good.

The graph of the Yard Occupancy Ratio (YOR) value for the Port of Kalabahi Pier 2 in 2022 shows good performance based on the monthly YOR value. The highest YOR value was recorded in October at 25.96%, still below the operational performance standard set at 40%. Meanwhile, the lowest YOR value was recorded in September at 9.98%, below the operational performance standard. Thus, the performance of the stacking field can be said to be good.

D. EVALUATION OF THE PERFORMANCE OF SEA HIGH SHIPS SERVICES FROM THE OVERVIEW OF THE EFFECTIVENESS AND PRODUCTIVITY OF EXPRESS LINER SHIP AT WHETHERS

An assessment of port performance indicators will be carried out by reviewing the performance of ship services in carrying out services for both goods and passengers, but this calculation will focus on service to goods only. Based on the Decree of the Director General of Sea Transportation Number UM.002/38/18/DJPL-11 December 15th, 2011 concerning Port Operational Service Performance Standards, operational service performance is the measurable result achieved at the Port in the delivery of ship services, goods, utilities and equipment in specific time period and units. From these data, it can be concluded that the Port of Kalabahi Pier 2 shows good performance based on the BOR and YOR values in 2022.

Table 3 Average value of waiting time (WT), boxes per ship per hour (B/S/H), and effectiveness (ET:BT) on express liner ships route T-14 at Port of Larantuka in 2021 and 2022

	Port of Larantuka		
N	**Indicator**	**2021**	**2022**
1	*Waiting Time* (WT) (Hour)	1.60	1.15
2	*Box per Ship per Hour* (B/S/H)	1	0
3	Effectiveness (ET:BT)	34.07%	29.26%

Based on Table 4, the results of the B/S/H (box/ship/hour) calculation for the T-14 Express Liner ship route at the Port of Larantuka in 2021 show that the two ships, KM. Kendhaga Nusantara 7 and KM. Nusantara Logistics 1, can only serve 1 container box within one hour. This indicates that the performance of container loading and unloading services at the Port of Larantuka in 2021 has not been effective and needs to be improved to achieve the set performance standards. In 2022, the B/S/H value for both ships is 0, which means it takes more than 1 hour to serve 1 container box. This shows that the performance of container loading and unloading services at the Port of Larantuka in 2022 is not good and needs to be improved to achieve the set performance standards.

The effectiveness of loading and unloading of containers from Express Liner ships route T-14 at the Port of Larantuka in 2021 and 2022 is also considered not good. In 2021, the highest effectiveness occurred in April with a value of 39.13%, while the lowest effectiveness occurred in January with a value of 26.32%. The average effectiveness in 2021 was 34.07%, which fell short of the set standard. In 2022, the highest effectiveness will occur in January and February with a value of 35.71%, while the lowest effectiveness will occur in July, September and October with a value of 22.22%. The average effectiveness in 2022 is only 29.26%, which also falls short of the set standards. In terms of waiting time (WT), which is the time waiting for ships to moor, in 2021 WT is 1.60 hours, while in 2022 WT is 1.15 hours. Both values are considered good because they are below the established performance standards. The productivity of loading and unloading of container ships on the T-14 Express Liner route at the Port of Larantuka in 2021 and 2022 shows a low value, namely 0-1 B/S/H.

This is lower than the performance standard set at 12 B/S/H. Evaluation needs to be done to increase productivity, such as extending the cargo dock, repairing inadequate loading and unloading facilities, and optimizing working time. The work effectiveness (ET:BT) of T-14 Express Liner vessels at the Port of Larantuka in 2021 and 2022 has not yet reached the set performance standards. The average work effectiveness in 2021 is 34.07%, while in 2022 it is 29.26%. This is due to the high idle time (IT) and not operation time (NOT) which indicates that time is not used properly. Evaluation actions that need to be taken are extending the effective working time, increasing the number of TKBM teams, and increasing the number of work shifts in one day to increase the efficiency of container loading and unloading time at the Port of Larantuka.

Table 5 Average value of waiting time (WT), boxes per ship per hour (B/S/H), and effectiveness (ET:BT) on express liner ships route T-14 at Port of Lewoleba in 2021 and 2022

	Port of Lewoleba		
N	**Indicator**	**2021**	**2022**
1	*Waiting Time* (WT) (Hour)	2.80	1.92
2	*Box per Ship per Hour* (B/S/H)	2	3
3	Effectiveness (ET:BT)	57.52%	70.33%

Based on Table 5, the results of B/S/H calculations for Express Liner vessels route T-14 at Lewoleba Port in 2021 show that the two ships, KM. Kendhaga Nusantara 7 and KM. Logistics Nusantara 1, can only serve 1 to 2 container boxes within one hour. This indicates that the performance of container loading and unloading services at the Port of Lewoleba in 2021 has not been effective and needs to be improved to achieve the set performance standards. In 2022, there will be an increase in the value of B/S/H, where both ships can serve 1 to 5 container boxes within one hour. Even though there has been an increase, the performance of container loading and unloading services at the Port of Lewoleba in 2022 is still not effective because it has not reached the specified performance standards.

The effectiveness of loading and unloading of containers from Express Liner ships route T-14 at Lewoleba Port in 2021 partially reaches the ET:BT performance standard set, but other months it does not reach the standard. The average effectiveness in 2021 was

57.52%, which reached the set standard. In 2022, most months hit the set ET:BT performance standard values, with an average effectiveness of 70.33%. The waiting time (WT) of the T-14 Express Liner ship at Lewoleba Port in 2021 is 2.80 hours, exceeding the set performance standards. However, in 2022, the waiting time is below the performance standard with a value of 1.92 hours. The productivity of loading and unloading of container ships on the T-14 Express Liner route at Lewoleba Port in 2021 and 2022 ranges from 2 to 3 B/S/H, which does not reach the set performance standards. The work effectiveness (ET:BT) of T-14 Express Liner vessels at Lewoleba Port in 2021 and 2022 has reached the set performance standards. This is due to the low idle time (IT) and not operation time (NOT), which shows the effective use of time in the container loading and unloading process. In order to improve the performance of container loading and unloading services at Lewoleba Port, evaluation measures that can be taken include extending the pier to 200 m, transferring the function of the special pier for container ships, carrying out maintenance of infrastructure facilities at the port, and repairing inadequate loading and unloading facilities. Apart from that, the quality of loading and unloading operations also needs to be improved, such as extending the effective working time, increasing the number of TKBM teams, and repairing damaged facilities.

Table 6 Average value of waiting time (WT), boxes per ship per hour (B/S/H), and effectiveness (ET:BT) on express liner ships route T-14 at Pier 2 Port of Kalabahi in 2022

N	Pier 2 Port of Kalabahi Indicator	2022
1	*Waiting Time* (WT) (Hour)	0
2	*Box per Ship per Hour* (B/S/H)	8
3	Effectiveness (ET:BT)	34.89%

Based on the analysis from Table 6, in 2022 at pier 2 of the Kalabahi Port, the Express Liner ship route T-14 will be able to serve 0 to 13 container boxes in one hour, which shows the effectiveness of loading and unloading performance which reaches the set standard of 11 B/S/H. However, it is necessary to improve performance to maintain the consistency of loading and unloading services at the Port of Kalabahi. However, based on Table and Figure 5.26, the effectiveness of loading and unloading of containers from Express Liner vessels route T-14 at pier 2 of the Kalabahi Port in 2022 does not reach the ET:BT performance standard which is set at 50%. The average effectiveness is 34.89%, which is still below the standard set. This is caused by high idle time (IT) and not operation time (NOT), which indicates less effective use of time in the loading and unloading process.

The waiting time (WT) for the T-14 Express Liner ship at pier 2 of the Kalabahi Port in 2022 is 0 hours, which shows good performance because it is below the operational service performance standard set at 2 hours. This is due to the existence of a special pier for container ships at the Port of Kalabahi. The productivity of loading and unloading of container ships on the T-14 Express Liner route at pier 2 of the Kalabahi Port in 2022 ranges from 6 to 13 B/S/H, with an average of 8 B/S/H. Even though it is still below the performance standard set at 11 B/S/H, this is due to poor time efficiency. To improve the performance of loading and unloading services at pier 2 of the Kalabahi Port, evaluation measures that can be taken include regulating discipline in carrying out port operational service work, increasing coordination between ships and ports, increasing the effective working time per day, and imposing sanctions on workers who do not work according to the set time.

E. ANALYSIS OF PERFORMANCE EVALUATION OF THE EXPRESS LINER PROGRAM FROM ECONOMIC REVIEW

In this sub-chapter, calculations will be made for the performance of the Express Liner program from an economic perspective using the Consumer Price Index (CPI) indicator. CPI is an index that calculates the change in the average price of a package of goods and services consumed by households in a certain period of time. CPI is also used as an indicator to measure inflation [23].

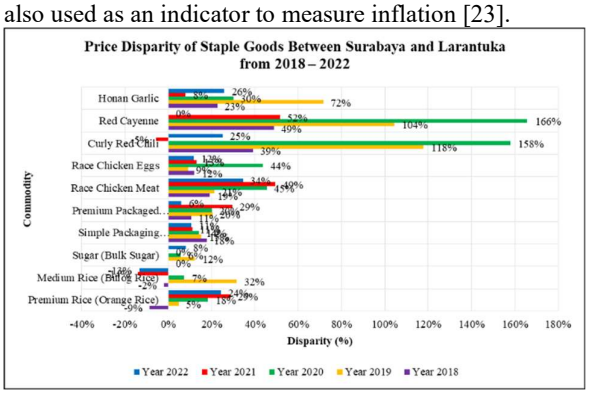

Figure 10 Price disparity of staple goods between Surabaya and Larantuka from 2018 – 2022

The purpose of this calculation is to determine the impact of the Express Liner program on the increase or decrease in prices of staple goods in the T-14 Express Liner service area. The performance of the Express Liner program will be assessed as successful or not by looking at the impact of the Express Liner program on changes in the prices of goods reviewed in the Express Liner service areas. The graph of the price disparity for each commodity between Surabaya and Larantuka, Lewoleba and Kalabahi in 2018 – 2022 can be seen in Figure 10 until Figure 12.

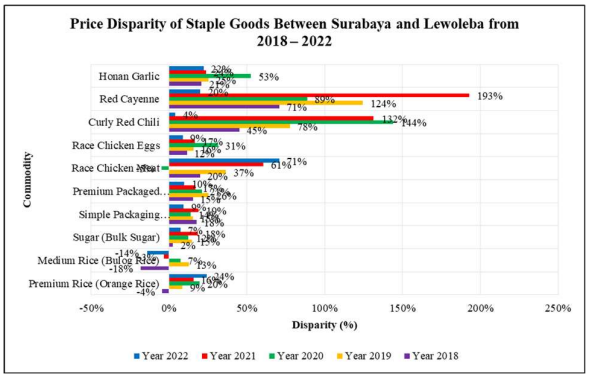

Figure 11 Price disparity of staple goods between Surabaya and Lewoleba from 2018 – 2022

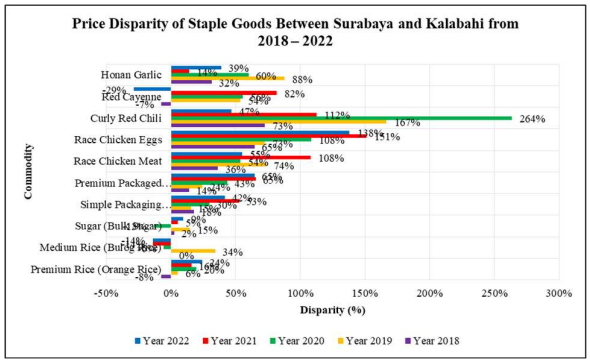

Figure 12 Price disparity of staple goods between Surabaya and Kalabahi from 2018 – 2022

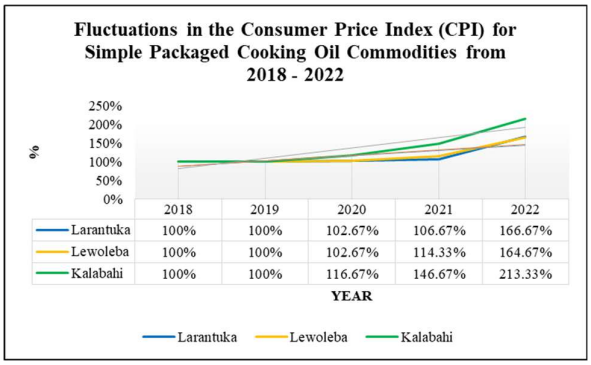

Figure 13 Fluctuations in the consumer price index (CPI) for simple packaged cooking oil commodities from 2018 - 2022

Meanwhile, in Kalabahi City, the premium rice commodity (orange rice) experiences the highest price disparity in

Table 7 Results of multiple linear regression test of variable mileage from Surabaya (X1) and price fluctuations in Surabaya (X2) on price disparity of basic goods (Y)

N	Commodity	Regression Equation	R^2	F
1	Premium Rice (Orange Rice)	$Y = 1.986 + 0.000X_1 + 0.000X_2$	0.448	4.872
2	Medium Rice (Bureau of Logistics Rice)	$Y = 1.667 + 0.000X_1 + 0.000X_2$	0.637	10.539
3	Sugar (Bulk Sugar)	$Y = 0.443 + 0.000X_1 - 1.22E\text{-}5X_2$	0.084	0.547
4	Simple Packaging Cooking Oil (Lavenia Plastic Packaging)	$Y = -1.546 + 0.002X_1 + 2.29E\text{-}6X_2$	0.411	4.187
5	Premium Packaged Cooking Oil (Bimoli Bottled)	$Y = -2.178 + 0.003X_1 + 1.28E\text{-}6X_2$	0.367	3.485
6	Race Chicken Meat	$Y = -0.148 + 0.000X_1 + 3.70E\text{-}5X_2$	0.084	0.547
7	Race Chicken Eggs	$Y = -7.956 + 0.012X_1 - 8.38E\text{-}6X_2$	0.65	11.119
8	Curly Red Chili	$Y = -4.374 + 0.009X_1 - 2.91E\text{-}5X_2$	0.583	8.383
9	Red Cayenne	$Y = 5.723 - 0.006X_1 - 1.81E\text{-}5X_2$	0.402	4.034
10	Honan Garlic	$Y = -2.477 + 0.002X_1 + 5.42E\text{-}5X_2$	0.15	1.059

The applied linier regression model can be shown in the previous Table [24]. The analysis shows that there is the highest price disparity between Surabaya City and Sub-District of Larantuka for several commodities. In 2021, the premium rice commodity (orange rice) has the highest price disparity of 29%. In 2019, medium rice (Bureau of Logistics rice) experienced the highest price disparity of 32%. Sugar (bulk sugar) has the highest price disparity in 2019 of 12%. Simple packaged cooking oil (plastic packaging lavenia) experienced the highest price disparity in 2018 of 18%. Whereas premium packaged cooking oil (bottled bimoli), purebred chicken meat, purebred chicken eggs, curly red chilies, red bird's eye chilies, and Honan garlic experienced the highest price disparities in 2021 of 29%, 49%, 44%, respectively., 158%, 166%, and 72%.

In Urban Village of Lewoleba, there is a level of disparity in the prices of basic goods that are different from the City of Surabaya. In 2022, the premium rice commodity (orange rice) will experience the highest price disparity of 24%. In 2019, medium rice (Bureau of Logistics rice) had the highest price disparity of 13%. Granulated sugar (bulk sugar) experienced the highest price disparity in 2021 of 18%. Simple packaged cooking oil (plastic packaging lavenia) experienced the highest price disparity in 2019 of 19%. Whereas premium packaged cooking oil (bottle packaged bimoli), purebred chicken meat, purebred chicken eggs, curly red chilies, red cayenne peppers, and Honan garlic experienced the highest price disparities respectively in 2019 of 26%, 71%, 31% , 144%, 193%, and 53%.

2022 of 24%. In 2019, medium rice (Bureau of Logistics rice) had the highest price disparity of 34%. Granulated sugar (bulk sugar) experiences the highest price disparity in 2022 of 9%. Simple packaged cooking oil (lavenia in plastic packaging) experienced the highest price disparity in 2021 of 53%. Whereas premium packaged cooking oil (bottle packaged bimoli), purebred chicken meat, purebred chicken eggs, curly red chilies, red bird's eye chilies, and Honan garlic experience the highest price disparities in 2022 respectively of 65%, 108%, 151%, 264%, 82%, and 88%.

After knowing the price disparities that occur in staple commodities, the next step is to find out more about the impact given by the implementation of the Express Liner by calculating the Consumer Price Index (CPI) in the T-14 Express Liner service area. An example of a Simple Cooking Oil CPI can be seen in Figure 12.

The price disparity for staple goods in the T-14 Express Liner service area has increased from 2018 to 2022. The price disparity between the Larantuka, Lewoleba and Kalabahi areas and Surabaya is caused by several factors that affect the imbalance in the price of goods between regions. However, this sub-chapter will analyse how the effect of the ship's mileage from Surabaya and fluctuations in prices of staple goods in Surabaya on price disparities in the T-14 area.

The method used is multiple linear regression with the classical assumption test using the SPSS 25 program. This method is used to measure the effect of more than one (independent) predictor variable on the dependent variable,

namely price disparities. In this analysis, two predictor variables were used, namely the ship's distance from Surabaya (X1) and price fluctuations of staple goods in Surabaya (X2), because they have the same number of variables and a limited analysis time period.

The classic assumption test is carried out to ensure that the data used meets the test requirements. These tests include the normality test, linearity test, multicollinearity test, heteroscedasticity test, and autocorrelation test. All staple commodities that are still experiencing price disparities, such as medium rice, premium rice, sugar, premium packaged cooking oil, simple packaged cooking oil, purebred chicken meat, purebred chicken eggs, curly red chilies, red bird's eye chilies, and honan garlic. will be tested.

Prior to testing, distance data from Surabaya to Larantuka, Lewoleba, and Kalabahi, data on prices of staple goods in Surabaya from 2018 to 2022, as well as data on price disparities of staple goods in each service area from 2018 to 2022 will be collected. The results of the multiple linear regression test for all commodities can be seen in Table 7.

The basis for decision making in this analysis is to compare the calculated F value with the table F value. From the number of data used is 15 data so that the value of degree of freedom 1 obtained is 2 and degree of freedom 2 is 12. Based on the distribution of the table F value$_{0.05}$, the F value of the table that will be the comparison is 3.89.

Based on the results of the influence analysis conducted, commodities that have a calculated F value of < 3.89, namely granulated sugar (bulk sugar), premium packaged cooking oil (bottled bimoli), purebred chicken meat, and honan garlic, it can be concluded that the distance from Surabaya (X1) and price fluctuations in Surabaya (X1) do not affect the price disparity of granulated sugar (bulk sugar), premium packaged cooking oil (bottled bimoli), purebred chicken meat, and honan garlic in Larantuka, Lewoleba, and Kalabahi. While commodities with a calculated F value of > 3.89 are premium rice (orange rice), medium rice (Bureau of Logistics rice), simple packaged cooking oil (plastic packaging lavenia), purebred chicken eggs, curly red chili, and red cayenne pepper, it can be concluded that distance from Surabaya (X1) and price fluctuations in Surabaya (X2) have a significant effect on the price disparity of premium rice (orange rice), medium rice (Bureau of Logistics rice), simple packaged cooking oil (plastic packaging lavenia), purebred chicken eggs, curly red chili, and red cayenne pepper in Larantuka, Lewoleba, and Kalabahi.

CONCLUSIONS

Conclusions that can be drawn from this study include:

1. After the Express Liner program, Larantuka Port has added several new facilities, including one unit head truck, forklift and tronton truck each. Of the nine main port facility items, seven of them are available, but the wharves and trestle need repairs. Port support facilities are complete with all items, but the storage area, passenger terminal 1, and roads require repair. Port container facilities only have two items, namely head trucks and tanks, while general cargo facilities only have forklifts and tronton trucks. Port loading and unloading facilities are only equipped with ship nets. In addition, there are 15 loading and unloading workers who are ready when the ship carries out loading and unloading activities. Port functional facilities already have 14 of the 17 items required, but several facilities still need improvement.
2. After the Express Liner program, Lewoleba Port has added new facilities, including two forklift units and one tronton truck unit. Of the 15 main port facility items, 12 of them are available, but the wharf, jetty and trestle need repair. Port support facilities have four out of five items, with passenger waiting areas requiring repair. The port container facility only has two items, namely the head truck and the container depot. The port general cargo facility only has three items, namely passenger ladders, forklifts, and tronton trucks. Port loading and unloading facilities are not yet complete with all items. In addition, there are 163 loading and unloading workers divided into four groups. The port functional facilities have all the necessary items, however the harbour fence and port lights need repair.
3. The Port of Kalabahi has not experienced additional facilities after the Express Liner program. The main port facility has nine of the eleven required items, and all are in good condition. Port support facilities already have all the items, but the warehouse needs repair. Port container facilities are not yet complete with all items. The port general cargo facility only has two of the seven items, namely barges and fire extinguishers. The port loading and unloading facility has four of the seven items, and all are in good condition. There are 150 loading and unloading workers divided into three teams. All functional port facilities are available.
4. Based on the results of the influence analysis conducted, commodities that have a calculated F value of < 3.89, namely granulated sugar (bulk sugar), premium packaged cooking oil (bottled bimoli), purebred chicken meat, and honan garlic, it can be concluded that the distance from Surabaya (X1) and price fluctuations in Surabaya (X1) do not affect the price disparity of granulated sugar (bulk sugar), premium packaged cooking oil (bottled bimoli), purebred chicken meat, and honan garlic in Larantuka, Lewoleba, and Kalabahi. While commodities with a calculated F value of > 3.89 are premium rice (orange rice), medium rice (Bureau of Logistics rice), simple packaged cooking oil (plastic packaging lavenia), purebred chicken eggs, curly red chili, and red cayenne pepper, it can be concluded that distance from Surabaya (X1) and price fluctuations in Surabaya (X2) have a significant effect on the price disparity of premium rice (orange rice), medium rice (Bureau of Logistics rice), simple packaged cooking oil (plastic packaging lavenia), purebred chicken eggs, curly red chili, and red cayenne pepper in Larantuka, Lewoleba, and Kalabahi.

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