Engineering and Technology Journal e-ISSN: 2456-3358

Volume 09 Issue 07 July-2024, Page No.- 4378-4381

DOI: 10.47191/etj/v9i07.05, I.F. – 8.227

Performance Evaluation of Fishery Logistics Systems at the Port of the Marine Toll Network Dobo Port, Maluku

Hadi Sholekhan Arif[1], Mustaruddin[2], Hoetomo Lembito[3]

[1,2,3]Agro-Maritime Logistics, Bogor Agriculture Institute, Jln Raya Dramaga, Bogor, Indonesia

ABSTRACT: The Sea Toll Program is a program organized by the government with the aim of increasing connectivity between islands in Indonesia, increasing distribution and maintaining the availability of basic necessities and important goods, thereby reducing price disparities across all islands. The Maluku Islands, especially Dobo port, is one of the regions in Indonesia that is rich in fish production and is also traversed by the Sea Toll program. Researchers want to see whether the Sea Toll program can support and synergize with the SLIN (National Fish Logistics System) program by measuring the fish logistics performance index (IKLI) at Dobo Port. The data collection technique was carried out using a purposive sampling technique with a questionnaire method. A total of 13 respondents were interviewed and the results of the fish logistics performance index at Dobo Port were 56.1%. Based on the ordinal scale, the IKLI value in Pel Dobo is sufficient but not optimal. There are three lowest dimensions that need to be improved so that the marine highway program in Pel Dobo can improve, namely the management dimension of fish procurement, the benefits dimension and the governance dimension.

KEYWORDS: Sea Toll, fish logistics, the fish logistics performance index (IKLI)

INTRODUCTION

Indonesia is one of the largest archipelagic countries in the world consisting of 17,504 islands and has 6.4 million km² water area, including 0.29 million km² of territorial sea, 3.11 million km² of archipelagic waters, and 3 million km² of EEZ (Samad et al. 2020). The KKP annual report (2019) states that Indonesia's fisheries resources contribute around 37% of fish supplies worldwide, some of which have high economic value, such as tuna, shrimp, lobster, shellfish, various types of ornamental fish and seaweed. With this great potential, logistics is one of the determining factors in managing Indonesian fisheries. This is mainly because fish is a highly perishable commodity, so the level of fish freshness is very dependent on the accuracy of handling and speed of logistics handling.

The Ministry of Maritime Affairs and Fisheries of the Republic of Indonesia is developing a fisheries logistics system through the National Fish Logistics System (SLIN) program. The aim of this program is to increase the capacity and stabilization of the national fisheries production and marketing system, strengthen and expand connectivity between upstream production centers, downstream production and marketing efficiently, and increase the efficiency of fish supply chain management, materials and production equipment, as well as information from upstream up downstream

As regulated in Presidential Regulation Number 26 of 2012 concerning the National Logistics System (SISLOGNAS) policy, in order to prioritize equal distribution of logistics in each region, it is necessary to develop logistics nodes in the maritime sector. The imbalance in trade, namely return cargo from the eastern region of Indonesia, also results in inefficiency in sea transportation, due to economic growth which is concentrated on the island of Java (Directorate General of Sea Transportation, 2020). This condition causes quite high price disparities between the western and eastern regions of Indonesia. The Indonesian government has launched a Sea Highway Program to connect islands in Indonesia and connectivity in frontier, outermost, remote and border areas in order to reduce price disparities between the western and eastern regions of Indonesia.

Based on the problem of synergy between the SLIN and Sea Toll programs, it is important to study the performance of fish logistics at the Sea Toll Network ports on SLIN in order to increase the competitiveness of fisheries commodities, especially in the eastern region of Indonesia and in order to create an efficient fisheries commodity logistics system. The eastern region of Indonesia, especially the Maluku Islands, has abundant maritime resource potential. Dobo Harbor is one of the ports in the National Fish Barn Area in Maluku Province and is the most productive area in the field of capture fisheries in Aru Regency (Rumadhan et al, 2021). Therefore, researchers feel that the Dobo Port area, Maluku, is the right area to measure the effectiveness of the Sea Highway Program on fish logistics.

METHODS

The type of data collected consists of primary and secondary data related to the SLIN program in the Maluku Sea Corridor Toll Road area. Primary data was obtained from interviews from parties/stakeholders related to fisheries logistics activities and sea toll ports. Meanwhile, secondary data was obtained from annual reports and documents related to SLIN.

This research plan uses an instrument in the form of a questionnaire. The questionnaire was first prepared based on a design for measuring fish performance in transporting/delivering fish via the Sea Highway. The questionnaire contains several questions needed to obtain data and information used in measuring fish logistics performance.

Fish logistics performance measurements were obtained through an interview process with selected respondents. The selection of respondents was carried out using a non-probabilistic sampling approach, namely a purposive sampling method. The following potential respondents include:

1. Fish owner (fishery business actor)
2. Logistics Service Provider
3. Sea Port and Fishing Port Authority
4. Regional Government
5. Fish Management Unit

Assessment of fish logistics performance index with modification of the Fish Logistics Performance Index (KKP 2019) which was originally four dimensions plus one additional dimension to become five dimensions, namely: (1) Product Management Dimension, (2) Efficiency Dimension, (3) Connectivity Dimension, (4)) Benefit dimensions and (5) Governance dimensions. The Governance Dimension aims to measure the impact of SISLOGNAS key drivers on SLIN components.

Then the dimension index is calculated by adding up all the values (scores) of each attribute in that dimension. The total score value for each attribute then divided by the maximum total value of the total attributes in the dimension concerned. To get an idea of the status within the maximum assessment range, the result of dividing the score value by the total maximum value is multiplied by 100%. So the performance of each dimension can be described as a percentage of the maximum value. This value describes performance in the form of a certain percentage of the overall maximum value. Furthermore, data regarding the fish logistics performance index obtained through questionnaires was then analyzed descriptively statistically using a brainstorming approach and focus group discussions.

RESULTS

The author distributed questionnaires to five categories of respondents with their respective roles and positions. There were thirteen respondents in the sample who were then interviewed. After the questionnaire data was obtained, the researcher then continued the process of calculating the dimension aggregation values. Aggregation scoring is an algebraic process for generating scaled values from attribute scores. The range of attribute score values in each dimension uses a minimum score of 1 (one) and a maximum score of 7 (seven) with a choice of score values respectively 1,3,5 and 7. Likewise, certain attributes regarding the nominal price of the answers given consist of very expensive (1), expensive (3), economical (5) and cheap (7). The following is the score data obtained from 13 respondents which was then processed to obtain aggregate index values for each dimension which were then used to determine the fish logistics performance index at Dobo Harbor. The questionnaires that have been filled out by respondents are then compiled and added up according to the dimensions contained in the attachment. Next, the weight of each dimension that has been grouped becomes the basis for the IKLI calculation which is explained in the table below

Table 1. Result of IKLI Dimension Calculations

IKLI Dimensions	Score Dobo - Sby/Jkt	Max score	Dimension Index (%)	Bobot Dimensi	IKLI (%)
Product Management Dimension	10.63	42.00	25.30	0.15	3.79
Efficiency Dimension	30.71	49.00	62.67	0.3	18.80
Connectivity Dimension	33.65	56.00	60.09	0.25	15.02
Benefit dimensions	16.22	21.00	77.25	0.1	7.73
Governance dimensions	75.32	140.00	53.80	0.2	10.76
IKLI					**56.10**

If we refer to the results of the standardized IKLI ordinal scale, a value of 56.1% is categorized as sufficient achievement. The following is an ordinal scale that is used as a reference regarding the interpretation of achieving IKLI targets and indicators:

Table 2. Interpretation Table of Target Achievement and Fish Logistics Performance Indicators based on reports from the Ministry of Maritime Affairs and Fisheries of INA

No	Range of Achievement	Achievement Category
1	14.29% - 31.43%	Very Less
2	31.44% - 48.57%	Not Enough
3	48.58% - 65.72%	Enough
4	65.73% - 82.86%	Good
5.	82.87% - 100%	Very good

The Fish Logistics performance index at Dobo Harbor based on the results of the questionnaire shows sufficient achievements. This is thought to be in line with the increase in routes passing through Dobo Harbor every year. From 2018 to 2024, Dobo Port has always been used as a transit port in the implementation of the sea toll program. In fact, in 2022 and 2023, Dobo port will be visited by 2 sea toll routes and in 2024 it will be visited by 3 sea toll routes.

The achievement of the fish logistics performance index at Dobo Port is also inseparable from the increase in referral container procurement. Refeer containers are needed for reverse cargo to maintain the quality of fresh fish and superior commodities from the area so that increasing reverse cargo is expected to be able to develop economic potential in underdeveloped, remote, outermost and border areas (3TP) that are visited by sea highways. The following is data on the increase in container referrals at Dobo Port from year to year

Tabel 3. Number of Backloads with Reefer Containers (Fresh Fish) at Dobo Port, 2021 – 2023

No	Year	Reefer Container (Teus) Dobo Port
1	2021	17
2	2022	89
3	2023	164

The fish logistics performance index at Dobo Port, which is a maritime toll road network, based on the results of questionnaire data, is indeed sufficient but still not optimal in distributing fish logistics as a whole in the Aru Islands. Based on a report from the Ministry of Maritime Affairs and Fisheries (2024), fish production that can be distributed via sea highways is only around 2.27% of the total fish production in Aru Regency. The following is a report regarding the total fish production and its distribution via the sea toll:

Table 4. Contribution of Sea Highways to the Distribution of Fresh Fish in Aru Islands Regency, 2021 – 2022

	Fresh Fish (ton)							
Year	Production (kg)	Consumption per Capita (kg)	Total Population (Orang)	Total consumption (Kg)	Export potential (kg)	Export potential (kg)	Distributed by sea toll (kg)	Sea Toll contribution (%)
2021	99.308.820	78,02	102.916	8.029.506	91.279.314	99.300.790	340.000	0,34%
2022	78.409.080	79,49	103.860	8.255.831	78.400.824		1.780.000	2,27%

Based on the table above, it is informed that there is indeed an increase in the distribution of sea tolls from 2021 which was only 0.34% to 2.27% in the following year. Even though there has been an increase in distribution, researchers feel that the sea highway is not yet optimal in distributing fish logistics in Aru Regency.

Based on the results of interviews with fish logistics players at Dobo Port, it was concluded that the availability of data information regarding fish needs and fish production was not yet accessible to all logistics players. So data and information that can be used for fish resource stock analysis and logistics can only be accessed per unit of work and cannot be accessed in real time. Weak data management can also affect logistics system processes. This was also reported by Darmica (2023) who concluded that a good logistics system in several regions in Indonesia has not been achieved, much of this is due to logistics management that is not updated and the availability of information is only in each work unit and is not yet optimal for producing information. which is accurate and precise.

Based on the results of interviews with respondents, it was found that the sea highway still does not play a significant role in improving the economy in the local area. Logistics players at Dobo Port reported that the lack of a sea toll fleet was one of the causes of obstacles to the distribution of fish logistics in the region so that economic improvement

was not optimal. In line with what was also reported by Selasdini (2023) that there are several operational obstacles to maritime highways in several regions in Indonesia, such as limited loading and unloading facilities, inappropriate selection of the type of facility, limited dock facilities, double handling because the type of dock is not suitable, connectivity between routes that are not yet good in the hub and spoke operation scheme, access to ports is limited, there is a lack of storage space, ship transit times at a port can take quite a long time, routes are long and long, workers work hours are uncertain, and rates for Loading and Unloading Labor (TKBM)) which does not meet the standards.

CONCLUSION

Based on the results of interviews and calculating the dimension values for each respondent, it was found that the Fish Logistics Performance Index value at Dobo Port, Maluku, was sufficient. This result is in line with the increase in sea toll routes passing through Dobo Harbor. Apart from that, increasing the reference container load also increases the effectiveness of the sea toll road. However, there are still three dimensions aspects of fish logistics performance index which have a low weight so that the effectiveness of the Sea Highway does not provide maximum value. Based on this research, there are three dimensions that have the lowest scores, namely the Fishery Product Procurement Management Dimension, the Benefits Dimension and the Governance Dimension.

One strategy that can be implemented by the government to increase the effectiveness of the sea toll road is by improving the port management system. The port management information system must be accessible to every stakeholder so that decision making can be done as quickly as possible because it is computerized. With the development of industry 4.0, it is hoped that port management can utilize digital technology such as Big Data technology or the Internet of Things (IoT) so that data processes regarding logistics can be accessed easily. The next strategy that can be implemented to increase the effectiveness of sea toll based on this research is by increasing the number of ship fleets, adding sea toll routes, increasing the subsidy budget for sea toll roads and increasing refeer containers.

REFERENCES

1. Darmica Hari. 2023. Kelautan Berbasis Big Data Dalam Menghadapi Era Industri 4.0. *Jurnal Kelautan dan Perikanan Terapan Edisi Khusus* 81-85.
2. Direktorat Jenderal Perhubungan Laut. 2020. Tol Laut Konektivitas Visi Poros Maritim Indonesia.
3. [KKP] Kementerian Kelautan dan Perikanan. 2019. Laporan Tahunan Kementerian dan Kelautan Perikanan. Bogor.
4. [KKP] Kementerian Kelautan dan Perikanan. 2019. Modul Penghitungan Indeks Ikan. Direktorat Direktorat Jenderal Penguatan Daya Saing Produk Kelautan Dan Perikanan Kementerian Kelautan Dan Perikanan.Jakarta.
5. Rumadan Galib, Dwi Ernaningsih dan Riena F. Telussa. 2022. Upaya Peningkatan Produksi Perikanan Tangkap Di Ppp Dobo Kabupaten Kepulauan Aru Dalam Mendukung Maluku Sebagai Lumbung Ikan Nasional. *Jurnal Ilmiah Satya Minabahari* 7(01): 13-19.
6. Samad APA, Humairani R, Purnama NR dan Ayuzar E. 2020. Marine Fisheries and Aquaculture Production of Indonesia: Recent Status of GDP Growth. *J Mari Scie Res Ocean*. 3(4): 135-139.
7. Selasdini Vidya. 2023. Pengaruh Program Tol Laut Terhadap Ketersediaan Logistik di Wilayah
8. Tertinggal, Terpencil, Terluar, dan Perbatasan (T3P) di Indonesia. *Warta Penelitian Perhubungan* 35 (2): 67-76