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PRODUCTION COMPARISON OF PURSE SEINE CATCHES LANDED AT PPS NIZAM ZACHMAN JAKARTA

Komparasi Produksi Tangkapan Purse Seine Yang Didaratkan Di Pps Nizam Zachman Jakarta

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ABSTRACT

The Ministry of Fisheries and Fisheries (KKP) issued the latest policy in the form of Measured Fishing (PIT) to maintain the sustainability of natural resources. PPS Nizam Zachman is one of the fishing ports that implements this policy by providing weighbridge facilities. Weighbridges are useful in recording the production of landed catches. One of the highest productions at PPS Nizam Zachman is purse seine. Therefore, this study aims to analyze the comparison of purse seine production weighed using a dock scale with a weighbridge. The method used in this study is in the form of a survey. This study uses primary data obtained through interviews, as well as secondary data obtained through the annual report of PPS Nizam Zachman. This study uses descriptive and comparative descriptive analysis. The results of this study are the average production of purse seine catch from pier weighers of 3.546.809,30 kg and weighbridges of 3.761.069,60 kg, and an average difference of 214.260,30 kg. The comparison of the two is seen with the T-Test which produces a P Value of < 0,05, meaning that there is a significant difference. The average accuracy level of weighbridges of 94,31% shows that the data produced is not accurate, due to several factors such as the use of barrels, the availability of vehicle fuel, and the difference in fish transport drivers.

Key words: Accuracy Of Weighbridges, Comparison Of Catches, Measured Fishing.

ABSTRAK

Kementerian Kelautan dan Perikanan (KKP) mengeluarkan kebijakan terbaru berupa Penangkapan Ikan Terukur (PIT) guna menjaga keberlanjutan sumber daya alam. PPS Nizam Zachman salah satu pelabuhan perikanan yang menerapkan kebijakan tersebut dengan menyediakan fasilitas jembatan timbang. Jembatan timbang berguna dalam pencatatan produksi hasil tangkapan yang didaratkan. Salah satu produksi tertinggi di PPS Nizam Zachman yaitu *purse seine*. Oleh karena itu, penelitian ini bertujuan untuk menganalisis komparasi produksi *purse seine* yang ditimbang menggunakan timbangan dermaga dengan jembatan timbang. Metode yang digunakan pada penelitian ini berupa survei. Penelitian ini menggunakan data primer yang didapatkan melalui wawancara, serta data sekunder yang

didapatkan melalui laporan tahunan PPS Nizam Zachman. Penelitian ini menggunakan deskriptif komparatif. Hasil penelitian ini yaitu rata-rata produksi hasil tangkapan *purse seine* dari timbang dermaga 3.546.809,30 kg dan jembatan timbang 3.761.069,60 kg, serta rata-rata selisih sebesar 214.260,30 kg. Perbandingan keduanya dilihat dengan Uji-T yang menghasilkan P Value < 0,05 berarti terdapat perbedaan signifikan. Rata-rata tingkat akurasi jembatan timbang sebesar 94,31% menunjukan bahwa data yang dihasilkan tergolong belum akurat, karena beberapa faktor seperti penggunaan blong, ketersediaan bahan bakar kendaraan, serta berbedannya supir pengangkut ikan.

Kata Kunci: Akurasi Jembatan Timbang, Komparasi Hasil Tangkapan, Penangkapan Ikan Terukur

INTRODUCTION

North Jakarta is a region with significant capture fisheries potential in Indonesia, contributing 98% of the data and value of capture fisheries production in DKI Jakarta Province (Jakarta Central Statistics Agency 2023). The large potential of capture fisheries in North Jakarta is supported by its geographic location directly adjacent to the Java Sea, abundant fishery resources, and the support of the local government by providing infrastructure to support fisheries production. One of the largest fishing ports in Indonesia, located in North Jakarta, is the Nizam Zachman Ocean Fisheries Port (PPS). The Nizam Zachman PPS functions as a growth center for fisheries businesses and as a fishing center, as a landing place for fishing vessels of various sizes, and as a marketing and landing place for fish caught by fishermen (Muharom et al., 2019).

The highest catch yield at the Nizam Zachman Fishing Port (PPS) comes from purse seines, particularly large pelagic ones. Purse seines are the dominant fishing gear used at the PPS Nizam Zachman. Gunawan et al. (2021) stated that in 2019, 441 vessels used purse seines out of a total of 1,559 fishing vessels. Purse seines produce quite diverse catches. The dominant catches from purse seines include skipjack tuna, mackerel, scad, tuna, trevally, mackerel, and scad (Adhawati et al., 2023).

Recording of large pelagic purse seine catches at the Nizam Zachman PPS is done by weighing them directly at the dock. However, the latest policy issued by the Ministry of Maritime Affairs and Fisheries (KKP) through Government Regulation (PP) Number 11 of 2023 concerning Measured Fishing (PIT) requires recording catch production using dock scales and weighbridges. Weighbridges are the latest facilities to support the PIT policy, which is useful for recording landed catch production.

The presence of weighbridges allows catch production data to be obtained from two different methods: weighbridge and pier scales. However, there are differences between the data generated by pier scales and those generated by weighbridges. Therefore, this study aims to compare the catch production of large pelagic purse seine fish weighed directly at the pier and using weighbridges, as well as the differences between the two weighing methods.

RESEARCH METHODS

Time and Place of Research

This research was conducted from September 2024 to January 2025 at the Nizam Zachman PPS Jakarta. The research location is at coordinates 6°5'59.03" South Latitude and 106°47'59.19" East Longitude, as shown in Figure 1.

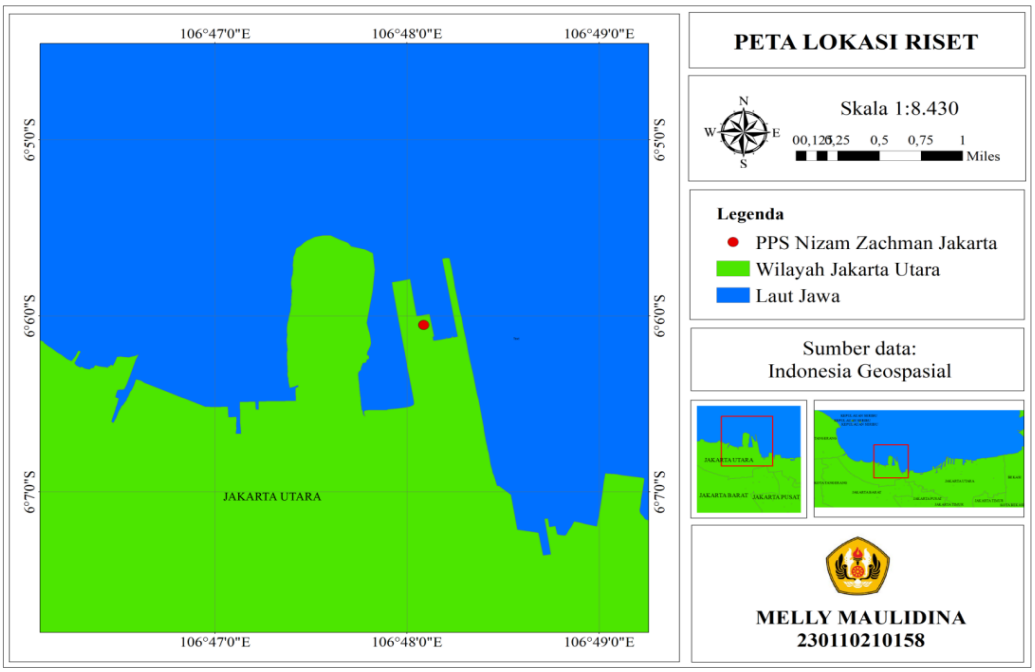

Figure 1. Research Location Map

Research Tools and Materials

The tools and materials used in this research include writing tools which are useful for recording information in the field, a mobile phone which is useful for documenting research activities, a laptop for processing data, and a questionnaire sheet which is useful as a list of questions in obtaining primary data.

Research methods

The method used in this research was a survey. The survey method involves collecting data from samples located in a specific location to generalize observations, resulting in more accurate data (Sugiyono, 2013).

Research Parameters

The parameters observed in this study were the role of weighbridges, purse seine catches, comparison of purse seine production weighed directly at the dock and using weighbridges, and the level of accuracy of the weighbridges. The data used in the study were primary data in the form of the role of weighbridge use obtained through interviews with employees and business actors at PPS Nizam Zachman, while secondary data in the form of large pelagic purse seine catch production obtained through the annual report of PPS Nizam Zachman.

Analisis Data

The analysis used in this research was descriptive and comparative descriptive analysis. The data obtained was processed using software to produce structured data. Primary data was processed descriptively, while secondary data was tabulated into a comparative table. Comparison of catch production weighed at the pier and weighbridge was analyzed using a paired t-test, and the accuracy of the weighbridge was calculated using the following formula (Pane 2017 in Hamzah et al., 2024)

$$.PD = \frac{(D2-D1)}{D1}$$

$$TKD = \{100-|PD|\}$$

Information:
D1 = Comparative production data (Pier weighing)
D2 = Production data to be compared (Weighbridge)
PD = Data deviation
TKD = Data accuracy level
TKD 95 – 99% = Accurate group data
TKD <95% = Inaccurate group data

RESULTS

A weighbridge is a set of tools used to weigh goods vehicles, whether permanently installed or portable, to determine the weight of the vehicle and its load (Daulay, 2024). In the fisheries sector, a weighbridge is a useful tool for recording the production of landed fish catches. The Nizam Zachman Port Fisheries Service (PPS) pioneered the use of weighbridges as weighing aids in the fisheries sector in Indonesia. The following is a general overview of the weighbridge at the Nizam Zachman Port Fisheries Service (Figure 2).

Figure 2. Weighbridge Construction

The Role of Weighbridges at PPS Nizam Zachman

The weighbridge was procured to support the Measured Fishing (PIT) policy. The use of weighbridges is necessary due to the transition from Pre-Production to Post-Production Non-Tax State Revenue (PNBP) policies, as regulated in Government Regulation Number 85 of 2021. According to Ministerial Regulation Number 01 of 2023, Post-Production PNBP is PNBP that must be paid after the issuance of a business permit for the fishing subsector based on the fish landed by fishing vessels or fish transport vessels. The weighbridge at the Nizam Zachman PPS plays a vital role for several parties, namely the port and business actors. The weighbridge plays a crucial role at the Nizam Zachman PPS in generating useful data for comparison with production data weighed directly at the dock. The presence of a weighbridge as an aid in recording catch production is useful for validating data in the event of problems, such as errors in the manual scales used during weighing at the dock. Furthermore, the presence of a weighbridge is very helpful for data collection officers, when the number of vessels

unloading at the dock exceeds the number of data collection officers on duty. When this occurs, the loading and unloading of the catch continues even though the data collector is not recording it. Therefore, the weighbridge acts as a control in recording the catch production. Weighbridges are also useful for minimizing the loss of production data due to fraud during recording. Weighbridges are very helpful for data collectors in estimating the catch production, if there are vessels that do not weigh at the dock. Data generated by the weighbridge is very necessary if there are discrepancies or obstacles in recording at the dock. In addition, weighbridge data also serves as a benchmark for estimating the catch transported if weighing is not carried at the dock (Mulyono, 2024).

Determining catch production at the Nizam Zachman Fisheries Port (PPS) is carried out in two ways: direct weighing at the dock and weighing using a weighbridge. However, in practice, some businesses do not conduct direct weighing at the dock, citing concerns about maintaining the quality of their catch. For businesses that conduct weighing at the dock, the weighbridge serves to generate comparative data in the event of significant discrepancies between the business owner and the data collection officer. Meanwhile, for businesses that do not conduct weighing at the dock, the weighbridge serves as the primary source of landed catch production data. When businesses decide not to conduct weighing at the dock, the catch is weighed at their respective warehouses. This situation leads to discrepancies in records between businesses and data collection officers. Therefore, the Nizam Zachman Fisheries Port (PPS) provides a weighbridge to minimize data discrepancies between businesses and data collection officers (Supriadi, 2024).

Purse seine catch results at PPS Nizam Zachman

Large pelagic purse seine catches have the highest production levels at the Nizam Zachman Ocean Fishing Port. The following is the production of large pelagic purse seine catches landed at the Nizam Zachman PPS during the period November 2023–August 2024 (Table 1).

Table 1. Purse seine catch results at PPS Nizam Zachman

No	Types of Fish	Scientific Name	Volume (kg)
1	Albakora	*Thunnus alalunga*	1.627
2	Alu-alu	*Sphyraena barracuda*	11.994
3	Banyar	*Restrelliger kanagurta*	668
4	Black Pomfret	*Parastromateus niger*	6.881
5	Bearded Pomfret	*Rhinoprenes pentanemus*	10.841
6	Month-month	*Megalops cyprinoides*	6.477
7	Skipjack Tuna	*Katsuwonus pelamis*	20.776.214
8	Cendro	*Tylosurus crocodilus*	12
9	Baster Whitebait	*Isurus paucus*	4.097
10	Bottlefin Whitebait	*Centroscymnus crepidater*	869
11	Lanjam Whitebait	*Carcharhinus cautus*	8.359
12	Mako Whitebait	*Isurus spp*	333
13	Squid	*Loligo sp*	44.598
14	Rubber Squid	*Sthenoteuthis oualaniensis*	23.358
15	Bamboo Leaf	*Thryssa baelama*	1.901
16	Sea Snakehead	*Rachycentron canadum*	3.557
17	Gindara	*Lepidocybium flavobrunneum*	852
18	Machetes	*Chirocentrus dorab*	9.248
19	Gulamah	*Argyrosomus amoyensis*	4.416
20	Sailfish	*Istiophorus platypterus*	4.274

No	Types of Fish	Scientific Name	Volume (kg)
21	Swordfish	*Xiphias gladius*	3.969
22	The Fish Next Door	*Psettodes erumei*	4.397
23	Kaci-kaci	*Diagramma labiosum*	2.094
24	Rock Snapper	*Lobotes surinamensis*	1.207
25	Goats	*Pomacanthus semicirculatus*	9.043
26	Kerong-kerong	*Lethrinus spp*	5.118
27	Kuro	*Eleutheronema tetradactylum*	2.054
28	Kuwe	*Carangoides bajad*	12.878
29	Kite	*Decapterus maruadsi*	826.982
30	Benggol Kite	*Decapterus russelli*	2.301.012
31	Deles Flyover	*Decapterus macrosoma*	175.819
32	Layur	*Lepturacanthus savala*	3.228
33	Lemadang	*Coryphaena hippurus*	356.930
34	Lencam	*Lethrinus erythropterus*	9.097
35	Cigar	*Auxis rochei*	578.864
36	Yellowfin tuna	*Thunnus albacares*	5.273.031
37	Manyung	*Arius spp*	8.222
38	Nyunglas	*Arius thalassinus*	139
39	Semar	*Lampris guttatus*	10.031
40	Setuhuk Blue	*Makaira mazara*	24.747
41	Setuhuk Black	*Makaira Indica*	44.767
42	Sunglir	*Elagatis bipinnulata*	127.812
43	Mackerel	*Scomberomorus commerson*	36.061
44	Stem Mackerel	*Scomberomorus lineolatus*	957
45	Mackerel Plank	*Scomberomorus guttatus*	1.214
46	Teri	*Encrasicholina devisi*	85
47	Tengkek	*Megalaspis cordyla*	7.870
48	Gray Cob	*Thunnus tonggol*	175.637
49	Komo cobs	*Euthynnus affinis*	72.223
50	Krai cob	*Auxis thazard*	135.333
51	Balaki Banana Cobs	*Auxis thazard*	95.873
52	Cigar Banana Cob	*Auxis rochei*	864.600
53	Bigeye Tuna	*Thunnus obesus*	3.374.878
54	Other Fish	-	1.345
	Total		35.468.093

Source: Secondary Data 2024

Comparison of Purse Seine Catch Production at PPS Nizam Zachman

Determining catch production, particularly for large pelagic purse seine fish, is done in two ways: direct weighing at the dock and weighing using a weighbridge. These two weighing methods produce different data. The following table compares catch production weighed at the dock and weighed using a weighbridge (Table 2).

Table 2. Comparison of purse seine production at PPS Nizam Zachman

Month	Catch Production (kg)		Difference (kg)	The Ship That Landed
	Weighing Dock	Weighbridge		
November 2023	3.295.522	3.455.766	160.244	35
December 2023	5.563.443	5.757.959	194.516	36
January 2024	4.491.040	4.874.573	383.533	53
February 2024	5.288.520	5.693.518	404.998	50
March 2024	5.046.056	5.495.694	449.638	58
April 2024	2.759.935	2.923.639	163.704	35
May 2024	1.877.948	2.006.969	129.021	30
June 2024	2.279.493	2.355.991	76.498	23
July 2024	2.840.793	2.954.685	113.892	27
August 2024	2.025.343	2.091.902	66.559	24
Total	35.468.093	37.610.696	2.142.603	371
Average	3.546.809,30	3.761.069,60	214.260,30	-

Source: Secondary Data 2024

A t-test was conducted to determine whether there was a significant difference between production weighed using dock scales and weighbridge scales. The t-test results are shown in Table 3.

Table 3. Results of the t-test of catch production data

	Weighing Dock	Weighbridge
Mean	3546809.300	3761069.600
Variance	2014055972964.450	2361414156719.600
Observations	10	10
Pearson Correlation	0.998	
Hypothesized Mean Difference	0.000	
df	9.000	
t Stat	-4.733	
P(T<=t) one-tail	0.001	
t Critical one-tail	1.833	
P(T<=t) two-tail	**0.001**	
t Critical two-tail	2.262	
Mean	3546809.300	3761069.600

Weighbridge Accuracy Level

Due to the significant differences between data weighed directly at the dock and data weighed on a weighbridge, it is necessary to determine the accuracy of the weighbridge. The following shows the accuracy of weighbridge data compared to dock data (Table 4).

Table 4. Weighbridge Accuracy

Month	Production of Catch Results (kg)		Data Deviation (%)	Accuracy Level (%)
	Weighing Dock (D1)	Weighbridge (D2)		
November 2023	3.295.522	3.455.766	4,86	95,14
December 2023	5.563.443	5.757.959	3,50	96,50
January 2024	4.491.040	4.874.573	8,54	91,46
February 2024	5.288.520	5.693.518	7,66	92,34
March 2024	5.046.056	5.495.694	8,91	91,09
April 2024	2.759.935	2.923.639	5,93	94,07
May 2024	1.877.948	2.006.969	6,87	93,13
June 2024	2.279.493	2.355.991	3,36	96,64
July 2024	2.840.793	2.954.685	4,01	95,99
August 2024	2.025.343	2.091.902	3,29	96,71
Total	35.468.093	37.610.696	-	-
Average	3.546.809,30	3.761.069,60	5.69	94.31

DISCUSSION

The Role of Weighbridges at PPS Nizam Zachman

The weighbridge was procured to support the Measured Fishing (PIT) policy. The use of weighbridges is necessary due to the transition from Pre-Production to Post-Production Non-Tax State Revenue (PNBP) policies, as regulated in Government Regulation Number 85 of 2021. Based on Ministerial Regulation of Maritime Affairs and Fisheries Number 01 of 2023, Post-Production PNBP is PNBP that must be paid after the issuance of a business permit for the fishing subsector based on fish landed by fishing vessels or fish transport vessels. The weighbridge at the Nizam Zachman Port plays an important role for several parties, namely the port and business actors. The description below is the role of the weighbridge based on the results of interviews with port data collection officers and representatives of business actors. The weighbridge plays a crucial role at the Nizam Zachman Port in generating data that is useful as comparative data with production data weighed directly at the dock. The presence of the weighbridge as an aid in recording catch production is useful for validating data in the event of problems, such as manual scales used when weighing at the dock experiencing errors. Furthermore, the presence of weighbridges significantly assists data collection officers when the number of vessels unloading at the dock exceeds the number of officers on duty. When this occurs, the loading and unloading of the catch continues even though the officers are not recording, thus the weighbridge acts as a control in recording the catch production. Weighbridges are also useful for minimizing the loss of production data due to fraudulent data collection. Weighbridges are very helpful for data collection officers in estimating catch production if there are vessels that do not weigh at the dock. Data generated by weighbridges is essential if there are discrepancies or obstacles in recording at the dock. In addition, weighbridge data also serves as a benchmark for estimating the catch transported if weighing is not carried at the dock (Mulyono, 2024).

Determining catch production at the Nizam Zachman Fisheries Port (PPS) is carried out in two ways: direct weighing at the dock and weighing using a weighbridge. However, in practice, some businesses do not conduct direct weighing at the dock, citing concerns about maintaining the quality of their catch. For businesses that conduct weighing at the dock, the weighbridge serves to generate comparative data in the event of significant discrepancies between the business owner and the data collection officer. Meanwhile, for businesses that do

not conduct weighing at the dock, the weighbridge serves as the primary source of landed catch production data. When businesses decide not to conduct weighing at the dock, the catch is weighed at their respective warehouses. This situation leads to discrepancies in records between businesses and data collection officers. Therefore, the Nizam Zachman Fisheries Port (PPS) provides a weighbridge to minimize data discrepancies between businesses and data collection officers (Supriadi, 2024).

Purse seine catch results at PPS Nizam Zachman

Based on Table 1, the highest production of large pelagic purse seine catches are skipjack tuna, yellowfin tuna, and bigeye tuna. These three types of fish are included in the large pelagic fish group, which is the main catch target of large pelagic purse seine fishing gear. Meanwhile, other types of fish are not included in the main catch target of large pelagic purse seine, but are also caught during fishing operations. The largest catch species of fish landed at PPS Nizam Zachman are skipjack tuna (Katsuwonus pelamis), yellowfin tuna (Thunnus albacares), and bigeye tuna (Thunnus obesus) with a total production of 71,139,922 kg, 18,514,874 kg, and 14,872,733 kg, respectively, originating from large pelagic purse seine, small pelagic purse seine, tuna longlines, and gillnets. Purse seine is the most widely used fishing gear at PPS Nizam Zachman in the 2021-2023 period (Budiman, 2024). The main catch targets of purse seine are pelagic fish that have schooling habits (Arsin et al., 2023). Research conducted by Mardiah et al. (2023) shows that large pelagic purse seine catches include tuna (Thunnus sp.), mackerel (Scomberomorus commerson), marlin (Istiophorus platypterus), and swordfish (Xiphias gladius). The purse seine operating areas that landed their catches at PPS Nizam Zachman, namely WPPNRI 572 and 573, resulted in catches dominated by skipjack tuna, scad, yellowfin tuna, bigeye tuna, and cigar banana tuna (Arianto, 2024). In line with Jatmiko et al. (2020) the catch of purse seine operated in WPPNRI 572 and 573 was skipjack, yellowfin tuna, and scad.

Comparison of Purse Seine Catch Production at PPS Nizam Zachman

Table 2 shows a significant difference in data between the production of large pelagic purse seine catches weighed directly at the dock and those weighed at the weighbridge. During the period of November 2023 – August 2024, the production of large pelagic purse seine catches weighed using the weighbridge was compared to the results of the pier weighing. The largest difference was in March 2024, which was 449,638 kg with the production of catches weighed at the dock of 5,046,056 kg and the production of catches using the weighbridge of 5,495,694 kg, with the number of vessels landing as many as 58 vessels. Meanwhile, the smallest difference was in August 2024, which was 66,559 kg with the production of catches weighed at the dock of 2,025,343 kg and using the weighbridge of 2,091,902 kg, with the number of vessels landing as many as 24 vessels. The average catch of large pelagic purse seine fish weighed at the dock was approximately 3,546,809.30 kg and using the weighbridge was approximately 3,761,069.60 kg, with an average difference of approximately 214,260.30 kg. The comparison of these data was further verified using a T-Test (Table 3).

The T-test results in Table 3 show a P-value of 0.001, indicating a significant difference. According to Louis (2021), a P-value <0.05 indicates that H0 is rejected or Ha is accepted (a significant difference exists), and a P-value >0.05 indicates that H0 is accepted or Ha is rejected (no significant difference exists).

Based on the results of interviews with several Enumerator Officers at PPS Nizam Zachman, the difference between the two data can be caused by the use of blong or pallets (fish storage containers), where the calculation of blong or pallets is done by estimating the number of blongs or pallets used visually. The condition of the fish that is thawing also causes differences between the two data. In addition, the mass of the driver, fuel availability, vehicle

modifications, and the occurrence of recording errors during weighing at the dock are also factors that cause differences in the recording results of the two methods. The existence of rounding of weighbridge data that is carried out (rounding up), causes the weighbridge data to always be larger than the dock weighing data.

Weighbridge Accuracy Level

Table 4 shows the percentage of data deviations obtained by subtracting the production of catches from the weighbridge (D2) from the production of catches weighed at the pier (D1), then divided by the production of catches through pier weighing (D1). During the period of November 2023 – August 2024, the highest accuracy rate occurred in August 2024 with a percentage of 96.71%, with a data deviation of 3.29%, while the lowest accuracy rate occurred in March 2024 with a percentage of 91.09%, with a data deviation of 8.91%. The average accuracy rate of the weighbridge in its 10 months of operation was 94.31% with a data deviation of 5.69%. Based on the average accuracy of the weighbridge, it can be said that the data produced by the weighbridge is relatively inaccurate. The deviation in the production data of large pelagic purse seine catches weighed at the weighbridge and at the pier occurred due to the incompatibility of the weight of the fish storage containers, as well as the availability of fuel in the fish transport vehicles. In addition, there are fraudulent factors that occur when dock weighing is carried out, such as cutting the scales during the recording process, this causes the reported data to not match the data in the field (Mulyono, 2024).

CONCLUSION

The average production of large pelagic purse seine catches weighed at the pier was 3,546,809.30 kg and at the weighbridge was 3,761,069.60 kg, and the average difference between the two was around 214,260.30 kg. The T-Test results of both data showed a significant difference with an average accuracy level of 94.31% and a data deviation of 5.69%. The data generated by the weighbridge was classified as inaccurate due to several factors such as the inappropriate weight of the fish storage container, the availability of vehicle fuel, and the mass of the driver.

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