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COMPARISON OF ILLEGAL-UNREPORTED-UNREGULATED FISHING PRACTICES BASED ON PORT TYPE IN JAKARTA BAY

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Abstrak. An assessment on Comparison of Illegal-Unreported-Unregulated (IUU) Fishing practices based on type of port in Jakarta Bay conducted on 8-12 February 2021 in 2 (two) classes of fishing port namely PPS (Pelabuhan Perikanan Samudra) Nizam Zachman and PPN (Pelabuhan Perikanan Nusantara) Muara Angke. IUU Fishing violation practices is a fishing activity that is inconsistent and not in accordance with the conservation values and fisheries management, and violates international, regional, and national policies. Indonesia's losses due to the practice of IUU fishing reach IDR 300 trillion annually or about 25% of Indonesia's total fishery potential. Aims of the assessment are to identify a violation rate of IUU Fishing, determine the value of IUU Fishing index and strategy for prevention and eradication of IUU Fishing practices in Jakarta Bay fishing port. Add the methods/analyse here … As a result of the studies showed that the highest of IUU Fishing violation rate occured at PPN Muara Angke which were about 184 of vessels compare with PPS Nizam Zachman which were only 63 vessels that contravene with rules. In addition, according to the index values of IUU Fishing at both fishing ports were moderate namely about 2,03 for PPS Nizam Zachman and 1,77 for PPN Muara Angke. Furthermore, based on the result of SWOT analysis that there are 3 (three) strategies to prevent and eradicate IUU Fishing practices consisted of: i) the strategy of optimization of integrated services which has a weight value of about 33,5%; ii) the strategy of establishment of law enforcement institution forum which has a weight value of about 31,3%; iii) the strategy of administration sanction for offender of unreported fishing which has a weight value of about 20,3%; and iv) the strategy of strengthening of vessels owner or patron (collectors) which has a weight value of about 15,0%.

Keywords: unregulated fishing; fisher's compliance; IUU Fishing

I. INTRODUCTION

As one of the countries with the largest areas of marine and coastal in the world, Indonesia has developed guidelines for the sustainable use of marine and coastal ecosystems **[1]**. Illegal Unreported and Unregulated (IUU) Fishing is a violation of capture fisheries practices that can endanger aquatic ecosystems, food security, and livelihoods, and IUU fishing has become a global problem. (Pramod **[2]**) In general, the practice of illegal fishing (Illegal Fishing) is an activity that violates the field of fisheries carried out by a member country of an RFMO (Regional Fishing Management Organization (RFMO) including ships operating in the waters of a country without a permit. Meanwhile, the practice of Unreported Fishing is activities not reporting or misrepresenting catches to the competent authorities at the national and RFMO levels, and unregulated fishing are activities carried out by stateless vessels or flying the flags of countries that are not members of the relevant fisheries organizations and are contrary to conservation or management principles. of a country or organization.

According to Pramod, G. **[2]** that the practice of IUU fishing in the world is between 13% and 31% of unreported catch, and more than 50% in some areas, and this illegal fishing costs between US$ $10 and $23.5 billions (billions) billions per year. In addition, the practice of IUU fishing is often associated with transnational crimes such as drugs, slavery, and smuggling (Pramod, G. **[2]**). The practice of IUU fishing has an impact on decreasing biomass and fish stocks so that capture fisheries yields cannot be maximized. It has been researched that rebuilding fish stocks due to over-exploited and IUU fishing practices can increase catches globally between 15% and 20% percent. (Commonwealth Secretariat **[3]**). According to FAO in Anticamara **[4]** that the global fishery stock that has been fully exploited is around 52%, over-exploited (depleted) 28%, and only 20% in moderate conditions. This overfishing has an impact on the economy of up to 50 billion US$ dollars per year (Anticamara **[4]**).

Meanwhile, Indonesia which has very wide waters with an area of 5.8 km2 or two thirds of the total area of Indonesia with the 2nd largest coastline in the world (95,181 km) and very large fishery potential and high economic value, with sustainable potential. fish resources or maximum sustainable yield (MSY) in Indonesia is estimated at 12.5 million tons/year, and the allowable catch is around 10.3 million tons/year (80% of MSY), has suffered losses due to the practice of IUU fishing. (Bappenas **[5]**; BPS **[6]**; EIBN, **[7]**). According to FAO **[8]** and Pusdatin **[9]**, that the practice of IUU fishing in Indonesia is relatively high with an estimated loss of US$1,557 bMillion, if converted to Rp. 20 trillion. According to FAO in Bappenas **[5]**, that in 2012 Indonesia was ranked 2nd for capture fisheries production. This fact illustrates that the potential of Indonesia's capture fisheries is very large, so that if managed properly and responsibly it can provide benefits to the state and society, as

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well as become capital for present and future development, in accordance with the mandate of Law Number 45 of 2009 concerning Amendment to the Invitation Number 31 of 2004 concerning Fisheries. However, fisheries management in Indonesia has not been optimal, even though many efforts have been made by the Government of Indonesia towards sustainable management, and ensuring the preservation of fish resources as mandated by Law Number 45 of 2009. This is due to the widespread practice of violating , for example: i) the still rampant practice of Illegal, Unreported and Unregulated (IUU) fishing; ii) symptoms of overfishing, or over-fishing in some Indonesian waters; iii) use of destructive fishing gear; iv) the monitoring system for the utilization of fish resources is still weak and ineffective. (Bappenas **[5]**).

In Indonesia, cases of IUU Fishing are rife in the Fisheries Management Area of the Republic of Indonesia (WPPNRI) and are very detrimental to the Indonesian people. According to the Supreme Audit Agency (BPK) in 2012 it found the potential lost state revenue reached Rp. 300 trillion/year due to illegal fishing carried out by foreign-flagged fishing vessels using modern equipment. (Darmika, **[10]**). In addition, the practice of IUU fishing also has an impact on social, economic, and environmental impacts. Some of the impacts of IUU fishing practices in Indonesia, among others: (i) Threatening the sustainability of fishery resources; (ii) The livelihoods of local fishermen who use small-scale fishing fleets and ordinary fishing equipment are hampered or disrupted because they cannot compete with illegal fishing actors; (iii) Loss of half of the country's fish production and foreign exchange earning opportunities; (iv) Reducing PNBP (Non-Tax State Revenue (PNBP); (v) Obstacles for the Indonesian Government in efforts to strengthen the fish processing industry, including increasing competitiveness; (vi) Giving a negative impact on the image of the Indonesian nation in international forums, because many ships Foreigners who fish illegally using Indonesian flags and vessels from Indonesia that carry out illegal fishing are in contravention of international conventions and agreements.This can also lead to an embargo on Indonesian fishery products marketed overseas.

Meanwhile, the direct impact of IUU fishing practices on aquatic ecosystems and fish resources can cause: i) increased over-exploitaion, resulting in decreased fish stocks; ii) decreased biodiversity; iii) decreasing economic and social sustainability, thus harming the interests of fishermen and the fishing industry. Examples of IUU fishing practices that have a direct impact are i) bycatch can have an impact on the loss of endangered, threatened and protected species; ii). the use of fishing gear such as trawls, both bottom and surface trawls, can reduce the complexity of benthic communities (Schmidt, C.C. **[11]**). Therefore, IUU Fishing practices are a threat that needs to be taken seriously, even IUU Fishing is currently categorized as a transnational crime. The Indonesian government has made various efforts to eradicate the practice of IUU fishing, ranging from catching foreign vessels, conducting a moratorium, issuing various policies to the prohibition of foreign vessels entering Indonesian waters. Within this framework, the issue of IUU Fishing remains at the top, and involves a complex network of actions and entities, which are in conflict with efforts to conserve and manage sustainable fisheries. (IOM **[12]**). Therefore, there is a growing need to understand more about IUU fishing violations. In this thesis, the author conducts a study or a study of one key dimension of the problem of IUU Fishing at a Fishing Port in Jakarta Bay, by estimating the compliance status of fishermen and the Government's efforts in this case the Port in implementing regulations in combating IUU Fishing practices.

The main reason for choosing the Fishery Port in DKI Jakarta Province is because the Fishery Port in DKI Jakarta, especially in the Jakarta Bay area, is the largest tuna fishing port in Indonesia (Hutapea, R. Y. F **[13]**). In addition, production growth every year for 5 (five) years, fishing ports in DKI Jakarta Bay, especially for PPS Nizam Zachman always increase, especially in 2010-2011 increasing by 0.54%, in 2011-2012 increasing by 14.62% , in 2012-2013 increased by 33.95%, in 2013-2014 increased by 7.01%. Likewise, the number of ships based in fishing ports is always increasing. Based on this, it is obtained a formulation that needs to be researched or studied how the level of compliance of fishermen in the practice of IUU Fishing is, how big the IUU Fishing index is and what efforts are being made to prevent and eradicate IUU fishing at fishing ports in Jakarta Bay.

Meanwhile, the objectives of this research are: 1. Identify the level of violation of fishermen in preventing and overcoming IUU fishing practices in types of fishing ports in Jakarta Bay. 2. Assessing the IUU Fishing Index in Types of Fishing Ports in Jakarta Bay. 3. Formulating strategies for preventing and eradicating IUU Fishing in Types of Fishing Ports in Jakarta Bay

II. RESEARCH METHODS

The research was carried out in 2 (two) Fishery Ports located in DKI Jakarta Province, namely at PPS (Ocean Fishery Port) Nizam Zachman and PPN (Nusantara Fishery Port) Muara Angke in February 2021. The study used an explanatory survey method with a direct comparative approach in research locations, with a total of 130 respondents consisting of 80 fishermen in PPS Nizam Zachman and 50 fishermen in PPN Muara Angke. In addition, researchers also used a sample of port officers to obtain information related to fisheries management in both types of ports. There are 2 (two) data analyzes carried out, namely

1. IUU Fishing index analysis
2. Strategy analysis using SWOT and AWOT (AHP and SWOT).
   a) SWOT (Strength, Weakness, Opportunity and Threat) analysis.
      SWOT analysis is used to evaluate the factors that are Strengths, Weaknesses, Opportunities, and Threats that may occur in achieving a goal of project activities /business activities or institutions/institutions on a scale that wider. Therefore, it is necessary to study environmental aspects both from the internal and

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external environment that affect the pattern of institutional/institutional strategies in achieving goals.

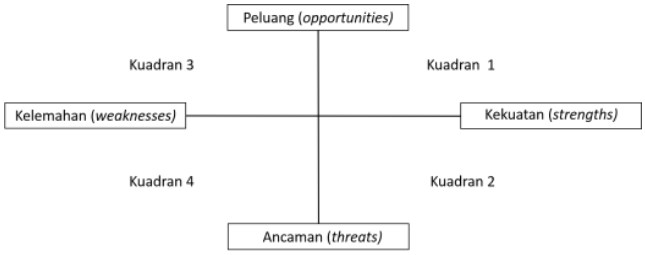

Figure 1. SWOT analysis diagram (Rangkuti **[14]**)

b) Analysis of AHP (Analytical Hierarchy Process)
This analysis is designed to rationally capture people's perceptions that are closely related to certain problems through procedures designed to arrive at a point of preference among various alternatives. So the AHP analysis is used in the decision-making process with a systems approach.

III. RESULTS AND DISCUSSION

1. Level of Compliance of Fishermen in IUU Fishing Practices.

Based on the data from the research results, it is found that there are differences in IUU Fishing practice violations between PPS Nizam Zachman and PPN Muara Angke. The level of violations of fishermen in Muara Angke VAT is higher than in Nizam Zachman's PPS, which is 137 violations in Muara Angke VAT. While in PPS Nizam Zachman there were 14 violations. In addition, there are differences in the types of violations between PPS Nizam Zachman and VAT Muara Angke

a. Illegal Fishing

Of the 137 violations for the Illegal Fishing category at the fishing port at the Muara Angke PPN, consisting of 29 motor boats violating legality, 10 motor boats violating the fishing area and 27 motor boats catching fish in the Thousand Islands National Park area whose zoning is not designated as an area. fish catching. Furthermore, there were 71 respondents who committed bycatch violations. All by-catch will be cut into pieces, mainly by-catch of shark species, whether protected or not. It aims to disguise fish products. By hence, all by-catch will be sold to the market by fishermen. This is different from fishermen based in PPS Nizam Zachman, where the by-catch will remain intact, so there is no mode of disguising the catch. By-catch fish that are not classified as protected will still be sold by fishermen as additional income **[15]**. The legal aspect of the fishermen is based on field findings, that 100% percent of fishing vessels in PPS Nizam Zachman have all licensing documents, namely SIUP, SIPI for fishing vessels, Fish Transporting Vessel Permit (SIKPI) for fish transporting vessels, Sailing Approval Letter (SPB), and ownership of ANKAPIN certificates for the captain, and ATKAPIN for the engineer. Motorboat compliance at PPS Nizam Zachman is due to strict supervision, which if the motorboat does not comply, the fish cannot enter or leave the fishing port. Based on the results of the study, found 25 fishing vessels and 55 fishing vessels. According to respondents, licensing arrangements at PPS Nizam Zachman are generally easy, but there are 15 respondents said it was difficult (Figure 2).

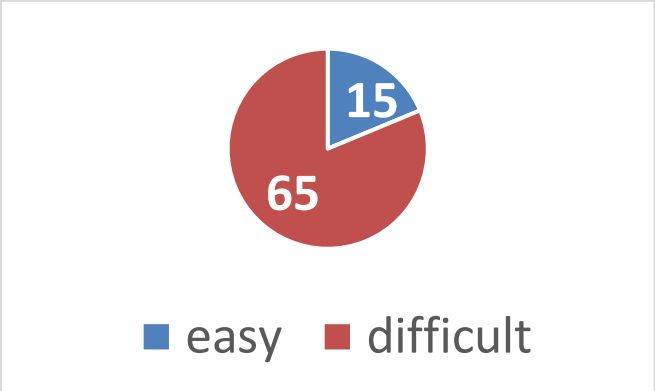

Figure 2. Ease of Licensing Management Procedures at PPS Nizam Zachman

b. Unreported Fishing

Fishermen based in Muara Angke PPN are dominantly obedient for the Unreported Fishing category, although 10 respondents were found to have violated fishing paths and locations. The fishing vessels that do not land at PPN Muara Angke are due to a patron-client relationship between small fishermen and capital owners, so that they land fish in Tangkahan ports owned by capital owners. Meanwhile, in PPS Nizam Zachman, the violations for the unreported fishing category were quite high, namely: 49 motor boats committed violations consisting of 15 motor boats transhipmenting, 15 motor boats turning off VMS whose purpose was to prevent the location of fishing boats from being known by VMS radar monitors, and 9 respondents admitted that the agents filled out the logbook. by the captain of the ship **[16]**. Fishermen based in Muara Angke PPN use motor boats under 30 GT, so they are not subject to the obligation to use VMS. Meanwhile, in PPS Nizam Zachman, all fishing vessels use VMS and turn it on since sailing, but in practice, it was found that at least 25 motor boats turned off VMS when in the middle of the sea. Turning off VMS in the middle of the sea is a mode of violation of IUU Fishing related to violations of fishing lines and violations of fishing areas. The purpose of turning off the VMS is so that the location of the violating fishing vessel is not known to the VMS radar monitor.

c. Unregulated Fishing

Violation practices for the unregulated fishing category were not found in PPS Nizam Zachman, so it can be said that 100 percent of ships based in PPS Nizam Zachman complied. Meanwhile, for ships based at PPN Muara Angke, there were 37 motor boats that violated, namely 18 motor boats that made additions to API (Fishing Equipment) and 19 motor boats that modified API.

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2. IUU Fishing Index in Types of Fishing Ports in Jakarta Bay.

Based on the Criteria Algorithm and Test Algorithm, the Value Algorithm is obtained which is the result of simplification of the parameter and criteria calculation system. Research results at Muara Angke PPN. reported that the IUU Fishing index value is 1.77, which means it is of moderate value as shown in Table 1 below.

Table 1. IUU Fishing Index in Muara Angke PPN

IUU Fishing Index	Value	Status
Illegal Fishing	1,99	
Unreported Fishing	2,08	
Unregulated Fishing	1,35	
Total Value	1,77	**Currently**

Meanwhile, the magnitude is 2.03, which means it is of Medium value (Table 2).

Table 2. IUU Fishing Index in PPS Nizam Zachman

IUU Fishing Index	Value	Status
Illegal Fishing	2,32	
Unreported Fishing	2,08	
Unregulated Fishing	1,73	
Total Value	2,03	**Currently**

The magnitude of the greatest influence is the index that has a small value is Unregulated Fishing (1.35). Thus, the Central Government and the Provincial Government of DKI Jakarta must pay attention to the unregulated fishing index which plays an important role in the occurrence of IUU fishing practices as presented in Figure 3.

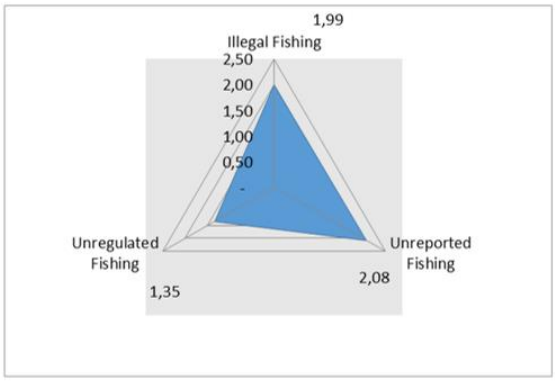

Figure 3. Magnitude of IUU Fishing in Muara Angke PPN

Meanwhile, based on the criteria algorithm and test algorithm at PPS Nizam Zachman, the IUU Fishing index value is obtained Meanwhile, the magnitude that has the biggest influence is the index which has a small value, namely Unregulated Fishing (1.73). Thus, the Central Government and the Provincial Government of DKI Jakarta must pay attention to the unregulated fishing index which plays an important role in the occurrence of IUU fishing practices (Figure 4).

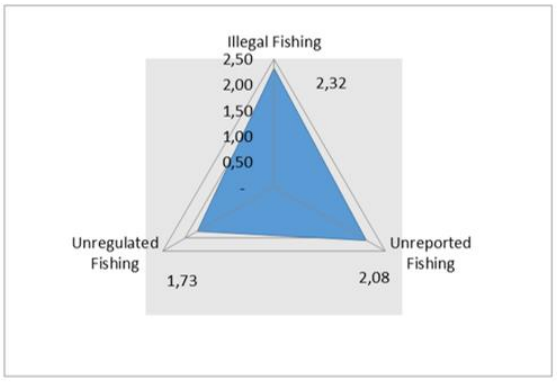

Figure 4. Magnitude IUU Fishing in PPS Nizam Zachman

3. Strategies for Prevention and Eradication of IUU Fishing in Types of Fishing Ports in Jakarta Bay.

a. Internal factors

Strength

Based on the results of interviews with respondents and secondary data searches, several factors were identified as strengths in the IUU Fishing prevention and eradication policy strategy. These strengths include:

(1) Existence of regulations related to IUU Fishing
(2) The existence of law enforcement agencies
(3) The existence of UPT and UPTD of Fisheries Port
(4) Regional policy support

Based on the strength factors above, the value of the influence of strategic factors as a component of strength in capture fisheries management can be seen in Table 12. This means that the existence of law enforcement agencies and the existence of UPT and UPTD of Fisheries Ports play an important role because has the highest value of 0.44.

Weaknesses

Based on the results of interviews with respondents and secondary data searches, several factors were identified as weaknesses in the policy strategy in preventing and eradicating IUU fishing. These weaknesses include:

(1) There are still many small fishermen who do not have BPKP
(2) The skipper does not fill in the logbook
(3) Weak recording/reporting of small fishermen
(4) Lack of human resources and capacity of fisheries supervisors
(5) Lack of coordination of law enforcement agencies

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Based on the weakness factors above, the value of the influence of strategic factors as a component of weakness in the prevention and eradication of IUU Fishing can be seen in Table 13, meaning that there are still many small fishermen who do not have BPKP, which greatly influences the weakness component. , because it has the highest value of 0.44.

b. External Factors

Opportunity

Based on the results of interviews with respondents and secondary data searches, several factors were identified as opportunities in the IUU Fishing prevention and eradication policy strategy. These opportunities include:

(1) MOU of Supervision between PSDKP and DKI Jakarta KPKP Office;
(2) MoU of DKI Jakarta KPKP Office with DKP of neighboring Provinces;
(3) Market demand related to legal and sustainable fisheries

Based on the opportunity factors above, the value of the influence of strategic factors as a component of opportunities in prevention and the eradication of IUU fishing can be seen in Table 14. This means that the market demand factor related to legal and sustainable fisheries is very influential on the opportunity component.

Threats

Based on the results of interviews with respondents and secondary data searches, several factors were identified as threats in the IUU Fishing prevention and eradication policy strategy. These threats include:

(1) Strong patron-client relationship between fishermen and capital owners
(2) Refusal to export Indonesian fishery products in international markets from IUU fishing activities
(3) The level of importance (sectoral ego)

Based on the threat factors above, the value of the influence of strategic factors as a threat component in the prevention and eradication of IUU Fishing can be seen in Table 15. This means that the strong patron-client relationship between fishermen and capital owners greatly influences the component threat, because it has the highest value of 0.69.

c. Alternative Strategy for IUU Fishing Prevention and Eradication.

After analyzing internal and external factors, alternative strategies can then be formulated using the SWOT matrix, which is a combination of SO, WO, ST, and WT strategies. Strategy formulation is carried out by considering the four factors, namely strengths, weaknesses, opportunities, and threats that have been identified. The resulting strategy is a combination of SO (strength-opportunities), ST (strength-threats), WO (weakness-opportunities), and WT (weakness-threats) which are summarized in the SWOT matrix. The formulation of the strategy is built using the SWOT matrix.

The IFAS value which is the difference in the total value of the influence of internal factors (strengths and weaknesses) is 1.75 – 1.81 = -0.07, while the EFAS value which is the difference in the total value of the influence of external factors (opportunities and threats) is 1, 54 – 1.95 = -0.40. A negative IFAS value means that cumulatively the weakness factor is greater than the strength factor, and a negative EFAS value means that cumulatively the opportunity factor is smaller than the threat factor, as shown in Figure 5.

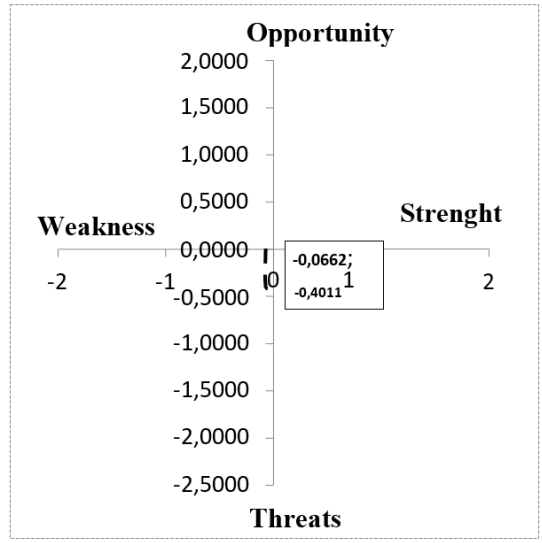

Figure 5. Space matrix diagram 59.

Based on Figure 23, it can be seen that capture fisheries management is in quadrant 4, meaning that this position indicates the prevention and eradication of IUU fishing but faces big challenges.

Alternative A. Strengthening the role of capital owner/patron
Alternative B. Administration of sanctions for violators of unreported fishing
Alternative C. Optimization of integrated services.
Alternative D. Establishment of a forum for law enforcement agencies

Based on the analysis, the strategic priority of capture fisheries management can be shown in Figure 24. Based on the results of the SWOT analysis, it was found that the optimization strategy of high value integrated services is the first priority with a value of 33.5%, the second priority is the establishment of a law enforcement agency forum with a weight value of 31, 3%, the third priority is the provision of administrative sanctions for violators of unreported fishing with a weight value of 20.3%, and the third priority is strengthening the role of capital owners/patrons with a weight value of 15.0% (Figure 6). Figure 6. AWOT Analysis of IUU Fishing Prevention and Eradication.

IV. CONCLUSION

Based on the results of data analysis and discussion, the conclusions according to the research objectives are as follows There is a difference in the level of IUU Fishing violations in Muara Angke VAT and Nizam Zachman PPS, namely the IUU Fishing violation rate in Muara Angke VAT

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is higher with 184 motor boats violating it compared to Nizam Zachman PPS which only 63 motor boats. The practice of violating IUU Fishing for the category of illegal fishing at PPS Nizam Zachman is only 17.50% with the type of violation being caught, namely catching protected fish. Meanwhile, in Muara Angke VAT there are 6 (six) types of violations, each of which are: 23.75% for types of violations that do not have BPKP, 12.50% for types of violations that do not have a small pass, 20% for types of violations of DPI, 54% for types of violations that catch fish in the area Conservation, 80% for the type of violation bycatch not intact catch, and 62% for the type of violation of the sale of fish bycatch. The practice of violating IUU Fishing for the unreported fishing category at PPS Nizam Zachman has 3 (three) violations. with each percentage value of 18.75% for the type of transhipment violation, 11.25% for the type of violation of logbook filling by agents, 33.25% for the type of violation of Deadly VMS. Meanwhile, in Muarang Angke PPN, there is one type of violation, namely 20% for the type of violation of the fish landing location to the patron. The practice of violating IUU Fishing for the Unregulated fishing category at PPS Nizam Zachman did not occur in violation, meaning that 100% of the fishermen complied. Meanwhile, in Muara Angke VAT there are 2 (two) types of violations. with each percentage value of 36% for types of violations that use additional APIs and 38% for types of motor boat violations that use modified APIs. The results of the analysis of the criteria algorithm and the test algorithm, the IUU Fishing index value for PPS Nizam Zachman is 2.03, which means it is of moderate value. The magnitude with the greatest influence is the index which has a small value, namely unregulated fishing of 1.73. Meanwhile, the IUU Fishing value for Muara Angke VAT is 1.77, which means it is of moderate value. However, the magnitude that has the greatest influence is the index which has a small value, namely unregulated fishing, which is 1.35. The strategic priority of capture fisheries management based on the results of the AWOT analysis found that the optimization strategy of high-value integrated services is the first priority with a value of 33.5%, the second priority is the establishment of a law enforcement agency forum with a weight value of 31.3%, the third priority is the provision of administrative sanctions for violators of unreported fishing with a weight value of 20.3%, and the fourth priority is strengthening the role of capital owners/patrons with a weighting value of 15.0%.

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