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Assessment of Fisheries Management Status with Ecosystem Approach on Bagan Boat Ship in Bungus Waters

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ABSTRACT

EAFM or Ecosystem Approach for Fisheries Management is a concept of how to balance socio-economic goals in fisheries management while still considering knowledge, information and uncertainty about biotic, abiotic and human interactions in aquatic ecosystems through a comprehensive and sustainable integrated fisheries management. The fishery potential is quite large in Bungus waters and the continuous fishing activities carried out by boat lift fishermen lead to overfishing; therefore fisheries management is very necessary to realize sustainable fisheries, especially for fishery commodities. The purpose of this study was to determine the status of the management of the bagan boat fishery in Bungus pps. This research was conducted in February 2022 at the Samudra Bungus Fishing Port, West Sumatra. The method used in this study uses the method issued by the National Working Group EAFM.DIT SDI KKP; the data taken are primary data and secondary data. Analysis of the data used using an ordinal-based likert scoring with a scoring assessment of 1,2,3. The greater the value, the better the EAFM that has been run. The results of the study show that the management of capture fisheries in the fishing technique domain at PPS Bungus is still lacking in implementing EAFM with a composite value of 18.8.

Keywords: EAFM, Likert, PPS Bungus, fishing techniques

1. INTRODUCTION

Bungus Ocean Fishing Port is a port located in Bungus Teluk Kabung sub-district, which is in Padang City, West Sumatra Province. PPS Bungus is located at coordinates 01^{o} 02'15 "LS and 100^{o} 2'34 "BT with an area of 30 ha. The fishery production at Bungus Ocean Fishing Port in 2020 was 4,776149 kg. Meanwhile, the export value of tuna fish in the 2016-2019 periods was IDR 32.3 billion. Exports of national marine and fisheries commodities during January-April 2021 increased by 4.15%. The increase in export value helped boost the 2021 export target for marine and fishery products of USD 6.05 billion (KKP, 2021).

Current fisheries management has not considered the balance between (1) fisheries resources and their ecosystems (2) the utilization of fisheries resources for the socio-economic interests of the community and (3) the fisheries policy itself. The importance of utilization for the socio-economic welfare of the community is felt to be greater than the health of the ecosystem. Therefore, an integrated approach through an ecosystem approach to fisheries management (EAFM) is needed (Budhiman et al., 2012; Charles, 2001). FAO (2003) defines EAFM (ecosystem approach to fisheries management) as a concept of how to balance socio-economic objectives in fisheries management (fishermen's welfare, fairness in fish resource utilization, etc.) while considering knowledge, information and uncertainties about biotic, abiotic components and human interactions in aquatic ecosystems through an integrated, comprehensive and sustainable fisheries management (Baihaqi & Hufiadi, 2016; Fauzia, 2005).

In this research, the domain that will be investigated is the fishing techniques domain, because in some areas there is uncontrolled exploitation of fish resources. Even in areas with depleted stocks, the fishing rate continues to increase, so that limited access to resources often leads to conflicts over fish resources. Technical control of capture fisheries should be carried out by controlling fishing effort (input control), catch management (output control)

and ecosystem control so as to prevent overfishing which has the potential to reduce fisheries production

2. RESEARCH METHODS

Time and Place of Research

This research will be conducted in February 2022. The research location is at Bungus Ocean Fishing Harbor, West Sumatra.

Methods

The method used in this research is the survey method. The survey method is research whose main source of data and information is obtained from respondents as a research sample using a questionnaire as a data collection instrument. Data collection was carried out using purposive sampling method. Purposive sampling is a technique for determining research samples with certain considerations that aim to be more representatives (Sugiyono, 2010).

Data Analysis

Based on the EAFM indicator module of NWG DIT SDI KKP, EAFM consists of 6 domains. Of the six domains, this study focused on the domain of fishing techniques. The data analysis used in this study uses a simple scoring system using an ordinal-based likert score system of 1,2,3.

3. RESULT AND DISCUSSION

Bagan Boat Fishing Gear

Bagan boat is a fishing gear widely used by fishermen in PPS Bungus for catching tuna *(Euthynnus affinis)*, layur (*Trichiurus lepturus)* and flyfish (*Decapterus* spp*)*. Bagan boat fishing gear is a rectangular fishing gear that has the same length and width. The construction of boat bagan fishing gear usually consists of a bag-shaped net made of nets, bamboo, ropes, and lights. Implementation of EAFM at PPS Bungus, discusses the assessment of boat bagan fishing gear in relation to the implementation of the fishing technique domain in EAFM which is described into 6 indicators.

Indicators of Destructive or Illegal Fishing Methods

Based on the NWG on EAFM 2014 module, for the assessment of this indicator, the data collected is in the form of data on violations committed by PPS Bungus' operating bagan boats. Data on violations of the Bungus PPS Fisheries and Marine Resources Monitoring (PSDKP) shows that in the past year there were 4 violations that occurred on bagan boat vessels. Based on the criteria and weight of the fishing technique domain in the NWG on EAFM 2014 module, this indicator scores 3 with a frequency of < 5 cases occurring in a year, as can be seen in the Table1.

Table 1. Violation cases on bagan boat vessels

No.	Date	Location	Offence
1	18 September 2020	Bungus oceanic fishing harbour	Without SIPI Centre
2	15 October 2020	Bungus bay kabung waters	Without SLO/SKAT
3	15 October 2020	Bungus bay kabung waters	Without SLO/SKAT
4	22 March 2021	Conservation area of the pieh island TWP and the surrounding sea	Fishing without SLO, SPI and fishing in Conservation Areas

Source: PSDKP violation data

Indicators of Fishing Gear and Fishing Aids Modification

It is not possible to score this indicator because data on the length of gonadal mature fish, Lc and Lm, are not yet available. This data is needed in determining modifications to fishing gear and fishing aids, so the score for this indicator is 0.

Indicators of fisheries capacity and fishing effort

Based on the NWG on EAFM 2014 module, the data collected in determining the indicator of fisheries capacity and fishing effort is in the form of the number of vessels, the amount of catch, and the total fishing trips of boat trawlers. Data can be obtained through logbooks at PPS Bungus, based on the criteria and weighting of this indicator, it scores 3 with

a fishing capacity ratio value of 2.93 (Table 2).

Table 2. Fishing capacity ratio

Year	Number of vessels (unit)	Total catch (tons)	Effort (trip)	Results of fishing capacity ratio
2017	103	103,022	158	$R = \frac{FC_m}{FC_n}$
2018	802	1831,917	1523	0,00074
2019	811	1505,581	802	0,22
2020	886	1504,266	811	0,90
2021	716	947,573	886	1,79
Average				2,93

Source: Laporan Tahunan PPS Bungus

Capture Selectivity Indicator

Based on the 2014 NWG on EAFM module, the assessment of this indicator is in the form of data on the total number of bagan boat fishing gear at PPS Bungus and the number of bagan boat fishing gear classified as non-selective. There are 102 fishing fleets in PPS Bungus that use bagan boat fishing gear. The classification of fishing gear types based on their selectivity according to the Semarang Fishing Development Centre (BBPI), boat bagan fishing gear is included in fishing gear with high selectivity. Bagan boat fishing gear at PPS Bungus is an environmentally friendly fishing gear and there are no modifications that cause damage to marine ecosystems. Based on the criteria and weight of the fishing technique domain in the NWG on EAFM 2014 module outlined in Table 3, this indicator scores 3 with the criteria of using non-selective fishing gear <50%.

Conformity of Function and Size of Fishing Vessels with Legal Documents

Based on the 2014 NWG on EAFM module, the assessment of the indicator of the suitability of the function and size of fishing vessels with legal documents, the data collected is in the form of the number of bagan boat documents and checking the number of bagan boat documents that do not match the facts of the function and size of the vessel. The results of checking all bagan boat vessels there are several vessels whose documents are incomplete. Based on the criteria and weight of the fishing technique domain contained in the NWG on EAFM 2014 module, this indicator received a score of 3 because less than 30% of the vessel samples did not match the vessel documents.

Indicator of Fishery Boat Crew Certification in Accordance with Regulations

The NWG Module on EAFM 2014 assessment of this indicator collected data in the form of data on the number of bagan boat vessels operated by certified crew at PPS Bungus (Anugerah et al. 2016). Data observed in the field shows that bagan boats do not yet have fishing crew certification in accordance with regulations. Based on the criteria and weight of the fishing techniques domain contained in the NWG on EAFM 2014 module, this indicator received a score of 0.

EAFM (Ecosystem Approach Fisheries Management) Assessment

After the calculation of the score, weight and density value is obtained, the value of the calculation is totaled to find the composite value of the total fishing technique from the calculation of the score, weight and density value can be seen in appendix 3 section D. After obtaining the results of the score, weight value, density value and index value, the composite value, flag color and description will be obtained according to the results of the value range.

The bagan boat fishing technique domain shows poor results, this is indicated by the composite value of 18.8. EAFM indicator assessment is a system that leads to a composite index related to the level of achievement of fisheries management in accordance with EAFM principles. From the total indicators assessed and analyzed using a simple composite analysis based on arithmetic averages displayed in the form of a flag model. The composite value obtained totaled 18.8 with a description of "poor" based on the score limit

of EAFM indicators in Table 4. This means that fisheries management in the bagan boat gear fleet at PPS Bungus still needs to be improved.

4. CONCLUSIONS

The fishing technique domain consists of 6 criteria, namely destructive or illegal fishing methods, modification of fishing gear and fishing aids, fishery capacity and fishing effort, selectivity of fishing, conformity of the function and size of fishing vessels with legal documents, and certification of fishing vessel crew. The assessment of each indicator gets different scores, the indicator of destructive or illegal fishing methods, fisheries capacity and fishing effort, suitability of function and size of the vessel and selectivity of fishing gets a score of 3 with a good description and the indicator of fishing gear modification and fishing aids gets a score of 0 because the data for the assessment of this indicator is not available and the crew certification data is still in process at PPS Bungus. So based on the EAFM assessment on the status of fish management based on the domain of boat mast fishing techniques at Bungus Ocean Fishing Port, it is categorised as not implementing EAFM with a composite score of 18.8.

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