International Journal of Multidisciplinary Research and Growth Evaluation.

Fishermen's perception and participation towards management and utilization of sea cucumber in Kepulauan Seribu National Park, Indonesia

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Article Info

ISSN (online): 2582-7138
Impact Factor: 5.307 (SJIF)
Volume: 04
Issue: 06
November-December 2023
Received: 24-09-2023;
Accepted: 26-10-2023
Page No: 661-665

Abstract
Kepulauan Seribu National Park has sea cucumber resources that have high economic value, many people utilize sea cucumbers as a source of livelihood. This study aims to determine how fishermen view the management of sea cucumbers and as actors of their utilization in the Kepulauan Seribu National Park. The management of sea cucumbers in the Kepulauan Seribu National Park, this research analyzes the data that is carried out is the processing of sea cucumber resource data. This research was conducted in May-June 2023 in Kelapa Island Village, North Kepulauan Seribu National Park. The methods used in this research are observation and interview methods, then distributing questionnaires, with the determination of respondents using the snowball sampling method. The analysis used is using the Likert method then used to conduct a qualitative analysis of community aspirations and participation in determining commercial sea cucumber management strategies based on the results of interviews. The results show that the community still does not know and has not participated much regarding Management, Determination of fishing regulations.

DOI: https://doi.org/10.54660/.IJMRGE.2023.4.6.661-665

Keywords: Participation, Perception, Management, Commercial Sea Cucumber

Introduction

The Kepulauan Seribu region has a fact that sea cucumber fishing activities have been carried out by local fishermen since 1973. The prospect of demand for sea cucumbers is quite high and with the passive nature of sea cucumbers (moving slowly and very easy to catch), will tend to support more intensive fishing efforts, especially in some areas of the Kepulauan Seribu waters which are thought to be the habitat of commercial sea cucumbers (Hasanah *et al*. 2012) [3]. Sea cucumbers are one of the echinodermata groups that have high economic value and are commercial in nature, related to this, the Kepulauan Seribu National Park has several types of commercial sea cucumbers including those from the genus Holothuria, Stichopus, and Actynopyga. Sea cucumbers are an important component of the food chain on coral reefs, and are associated with seagrass ecosystems, which have a role for the so-called trophic levels of the food structure (Taurusman *et al*. 2018) [10]. Sea cucumbers are much sought after by fishermen, even mothers of groups looking for sea cucumbers, to be sold to collectors, located in Kelapa Island Village, in the Kepulauan Seribu National Park, sea cucumbers are generally associated with coral reefs, which live at the bottom of sandy submarine waters and even sea cucumbers there are also not a few who are caught in nature and used as deposit feeders for cultivation of other biota. An important aspect of social studies in the scope of fisheries resource management according to (Satria 2002) is the actors involved in the management process carried out. The actors are government (government based management), community (community based management) or cooperation between the two (comanagement).

Research Location

This research was conducted in the Kepulauan Seribu National Park, Kelapa Island Village, in May-June 2023.

Methodology

This research was conducted in Kepulauan Seribu National Park, Kelapa Island Village, in May-June 2023. The method used in analyzing data is a discrptive method through field interview surveys, and distributing questionnaires to respondents with community-based methods. The measurement scale uses a Likert Scale which is used for weighting and scoring community perceptions. Likert scale used with 4 (Four) categories, namely 1 = Bad, 2 = Less, 3 = Enough, 4 = Good. According to (Likert 1932)

This study uses the snowball sampling method, because the population is not yet known at the time of research implementation. The snowball sampling method procedure is a sampling method obtained by rolling from one respondent to another, generally this method is used to nest social or communication patterns (sociometrics) of a particular community. (Salganik, M.J., Douglas D.H, 2007) [7]. In making a Likert scale is as follows:

Collection of items relevant to the problem under study

1. These items are described in the form of a questionnaire addressed to the specified respondents.
2. Responses from respondents were then given a score, for answers that gave a good indication were given the highest score.
3. The total score of each individual is the sum of the scores of each item of that individual.
4. Responses were analyzed to determine which items had a very real boundary between high scores and low scores on the total scale.

Data Analysis

Based on the final score obtained, it can then be categorized according to the level of achievement of the score of the respondent:

According to (Riduwan, 2010) [6]:

$$NA = \frac{SP}{SM} x100\%$$

Description:
NA = Final Grade
SP = Earned Score
SM = Maximum Score

Results

Fisherman Profile

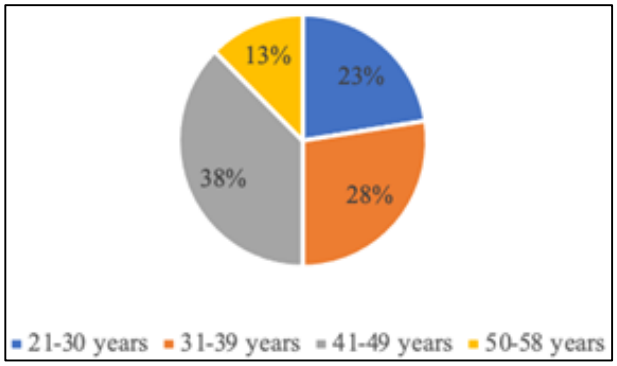

Fig 1: Average Age of Sea Cucumber Fishermen

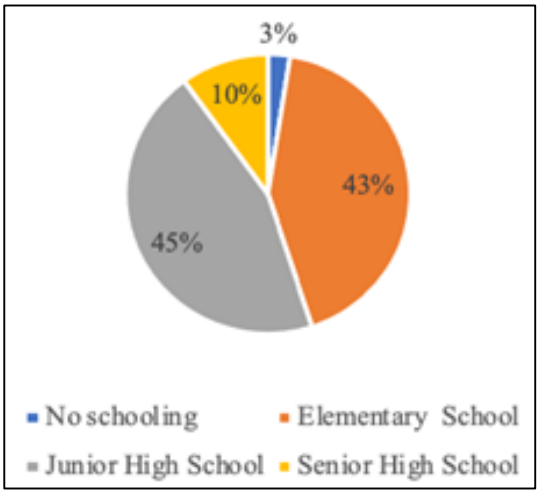

Fig 2: Average Education Level of Sea Cucumber Fishermen

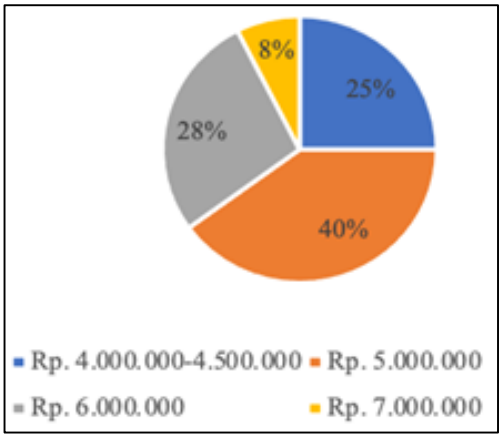

Fig 3: Average Income of Sea Cucumber Fishermen

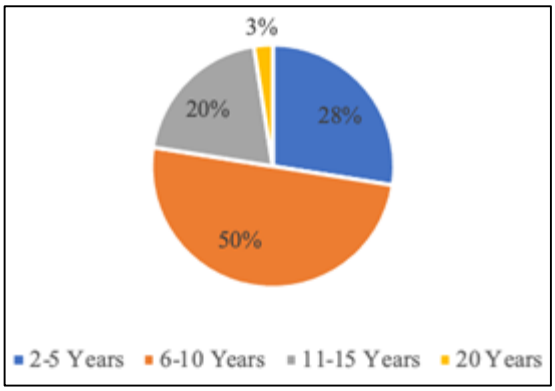

Fig 4: Length of time working as a sea cucumber fisherman

The profile of fishermen in the Kepulauan Seribu National Park as respondents of this study shows that the level of education of the community in the Kepulauan Seribu National Park is still low, causing human resources to be affected by it, this results in low human resources and community knowledge about sustainable fisheries management. Quoted from (Simangunsong, 2014) [8] that the Kepulauan Seribu National Park where the resources in the Kepulauan Seribu National Park are quite abundant, but the distribution of the population is uneven. It can be seen that in terms of economic aspects, people in the Kepulauan Seribu

National Park have a fairly good economy, it can be seen in (Fig. 3) that the average income of fishermen is in the range of Rp. 4,000,000.00; -Rp. 7,000,000.00;. 50% of fishermen have been working since 6-10 years. While 20% 11-15 years, 28% are still just pioneering the profession as sea cucumber seekers for 2-5 years. Many fishermen make sea cucumbers as a side catch, but many also catch sea cucumbers as the main catch with the frequency of searching every day from 17.00- 03.00 WIB. The selling price given by collectors is according to the type and size of sea cucumbers obtained.

Community Aspiration and Participation
Condition of Sea Cucumber Resources in the Kepulauan Seribu National Park

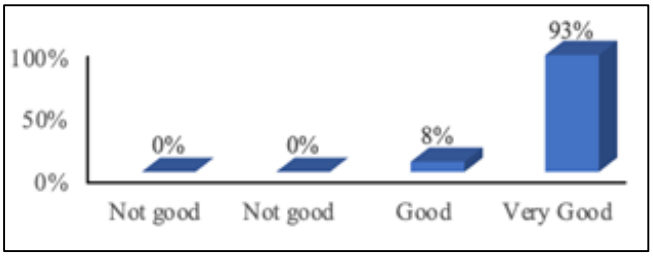

Fig 5: Condition of sea cucumber resources in the Kepulauan Seribu National Park

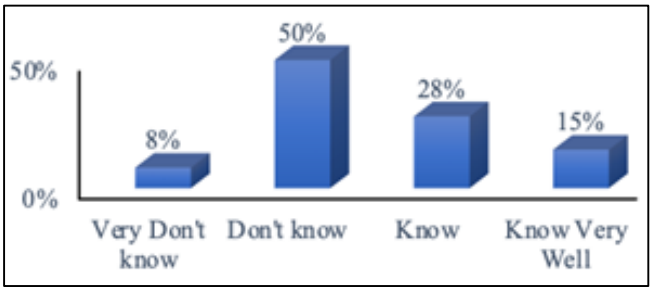

Fig 6: Level of Community Knowledge on the Benefits of Sea Cucumbers as Biopharmaceuticals and Foods

Sea cucumber resources in the Kepulauan Seribu National Park are said to be still quite good, the community's perception of the results contained in (Fig. 1) is reinforced based on the results of previous research (Sosiawan and Mustalafin, 2022) [9], where the condition of sea cucumbers in the Kepulauan Seribu National Park is still quite good, but from year to year it has decreased because there is a lot of exploitation carried out by fishermen, both from local fishermen and migrants. Related to this, sea cucumbers are biota that have high economic value which is widely utilized by researchers and scientists to be used as medicinal materials and food ingredients. The rich benefits of sea cucumbers for health and beauty make sea cucumbers have a fairly high economic value. Research suggests that sea cucumbers have *antibacterial* effects *against Streptococcus faecalis, Streptococcus viridans, Streptococcus pneumonia and Staphylococcus aureus*, from the results of experiments conducted it was seen that the inhibition of bacterial growth after being given sea cucumber extracts of Holothuria atra, Holothuria scabra and Bohadshi argus species (Fad'ha *et al.* 2017). This phenomenon is related to public knowledge about the benefits of sea cucumbers which affect the number of catches that are increasing, the question arises that whether fishermen know the benefits of sea cucumbers that have high commercial value. The results in (Fig. 2) explain that only 15% of fishermen are very aware of the benefits of sea cucumber resources as biopharmaceutical ingredients, 50% of them do not even know the benefits of sea cucumbers as medicines and others.

Sea Cucumber Management in the Kepulauan Seribu National Park

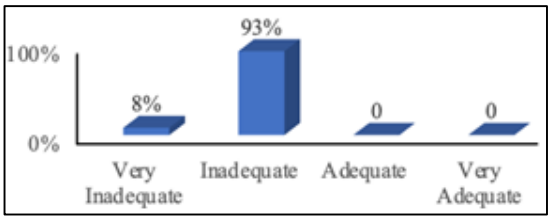

Fig 7: Sea cucumber management in the Kepulauan Seribu National Park

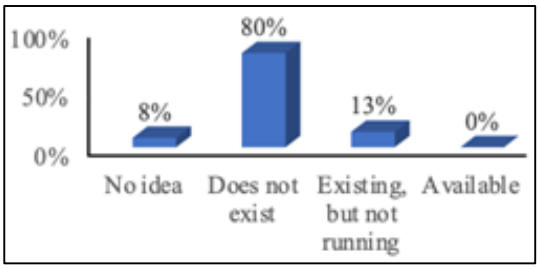

Fig 8: Sea cucumber fishermen group in the Kepulauan Seribu National Park

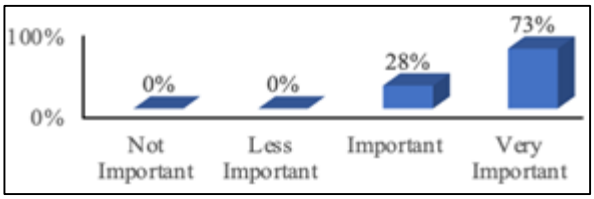

Fig 9: Importance of specialized sea cucumber management institutions and groups for the community

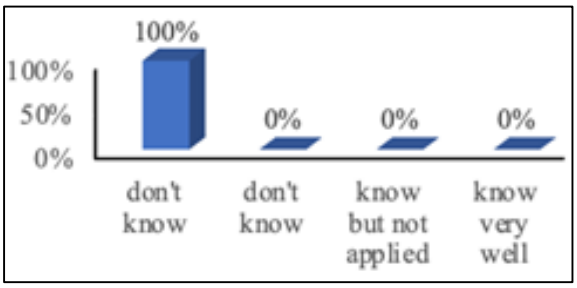

Fig 10: Community knowledge on sea cucumber fishing regulations in the Kepulauan Seribu National Park

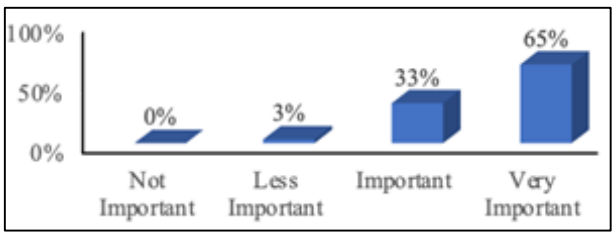

Fig 11: Importance of Counseling and Management of Sea Cucumbers in the Kepulauan Seribu National Park for Fishermen

The Kepulauan Seribu National Park does not yet have

support for commercial sea cucumber management. Inadequate facilities and infrastructure. The absence of trepang fishing regulations in the Kepulauan Seribu National Park and the absence of restrictions on the size of fishing makes sea cucumbers in the Kepulauan Seribu National Park increasingly exploited because they are still in the free category. The community certainly hopes that a special group of sea cucumber management will be formed in the Kepulauan Seribu National Park. The community thinks that it is very important to conduct counseling and training activities for sustainable sea cucumber management in the Kepulauan Seribu National Park, considering that sea cucumbers are one of the potential export commodities of the fisheries sub-sector (Karnila *et al*. 2011) [4]. Some fishermen in the Kepulauan Seribu National Park know that counseling and socialization are a means to support the increasing insight of fishermen for the economic sustainability of sea cucumbers in the Kepulauan Seribu National Park, but in reality, it is still fairly rare and rare in the Kepulauan Seribu National Park. Attention needs to be given by the community and competent parties, especially by the government through relevant agencies. Attention in the form of resource management and increasing added value. Management is related to the sustainability of resources so that exploitation activities (fisheries) will take place sustainably. Increased added value through counseling on processing techniques. Sea cucumbers are a food source (animal protein) that has an international market (BTNKpS, 2019) [1].

Participation of Fishing Communities in the Kepulauan Seribu National Park

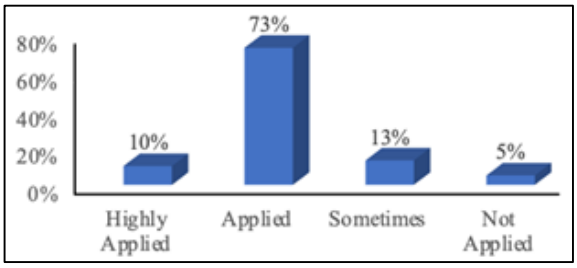

Fig 12: Community Participation in Complying with the Sea Cucumber Catching Restriction Regulation

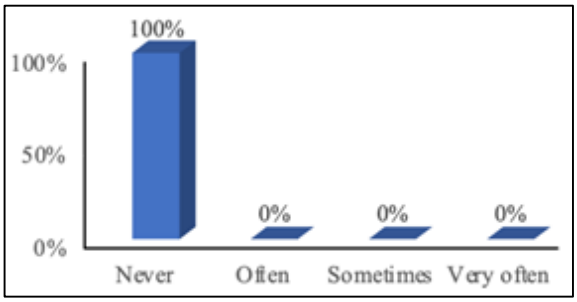

Fig 13: Community Participation in Complying with the Sea Cucumber Catching Restriction Regulation

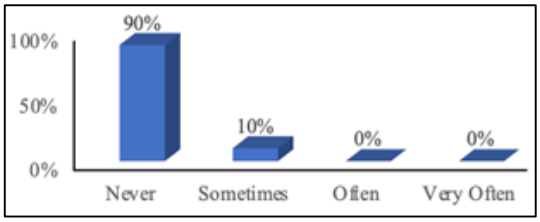

Fig 14: Involvement of sea cucumber fishing communities in sea cucumber management planning in the Kepulauan Seribu National Park

Community participation in the sustainability and management of commercially valuable sea cucumbers in the Kepulauan Seribu National Park is needed, as a measure of the success of the implementation of government regulations for the sustainability of protected resources. The community aspect is very important in this case. Most of the people think that if a fishing restriction regulation is imposed, the community will follow the regulation in an orderly manner, but there are also fishermen who still think that sea cucumbers are natural resources created by God that will never run out, this statement shows that low human resources also affect the understanding and.

Conclusion

Sea cucumber resources in the Kepulauan Seribu National Park still have good potential, but low human resources and lack of government intervention in providing policies and counseling on sea cucumber management, causing sea cucumber fishing can still be done freely, even from fishermen outside the Kepulauan Seribu National Park area. The lack of control of capture and utilization has caused the availability of sea cucumbers in nature to decline. It can be concluded that there is a need for government intervention that is more consistent in conducting counseling and assumptions of the community regarding commercial sea cucumber management in the Kepulauan Seribu National Park. Community involvement is still very lacking and many even show that the community is not included in the management plan of economically valuable resources such as sea cucumbers in the Kepulauan Seribu National Park. This is very unfortunate, even though the community expects counseling and guidance as well as financial assistance from the government to support sustainable ecosystems and sea cucumber resources in the Kepulauan Seribu National Park. Training to fishermen and communities in the Kepulauan Seribu National Park to support the successful management of sea cucumbers that have high economic value in the Kepulauan Seribu National Park, this can certainly benefit local fishermen and can be an appeal to migrant fishermen to pay more attention to the frequency of sea cucumber fishing by limiting the size of fishing to improve the sea cucumber utilization system that has fallen into the exploited category.

Acknowledgement

The author would like to thank the Seribu Islands National Park Office for giving permission to the author to carry out research in the National Park Management Section (SPTN 1) of Kelapa Island Village, Seribu National Park. Thanks are also expressed to all employees and the community as well as interns who have helped collect data in this research. The author also would like to thank the great name of Diponegoro University Alma Mater where the author continued his education. The author also thanks the late Dr. Bambang Sulardiono, M.Si, Dr. Ir. Suryanti, M.Pi M.Pi, and Dr. Ir. Frida Purwanti, M.Sc who has guided the author to complete the writing stage of this article.

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