

Objective Analysis of Resource Management for Skipjack (*Katsuwonus pelamis*) and Flying Fish (*Decapterus macrosoma*) in Waters of Pohuwato Regency, Gorontalo Province

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Abstract:- Skipjack and flying fish are the two main target fish species that are targeted by fishermen in Pohuwato Regency, this is because the prices of the two fish are quite stable and the stock is abundant. The purpose of this study is to identify fisheries goals based on the perceptions of stakeholders. This research was conducted in the waters of Pohuwato Regency. The Data analysis method is an analysis of stakeholders' perceptions of fisheries management objectives using conjoint analysis. The results of the analysis of fisheries management with the conjoint method by looking at the attributes that have the highest importance score are environmental quality of 14.69%, then showing that the management objectives should pay attention to the quality of the aquatic environment so that the highest score is inshore/offshore with a score interest of 11.52%.

Keywords:- Fisheries Management Objectives; Sustainability; Choice-Experiments; Conjoint Analysis; Stated Preference; Stakeholders.

I. INTRODUCTION

The potential of Indonesia's marine fish resources is estimated at 6.4 million tons per year consisting of large pelagic around 1.165 million tons per year, small pelagic around 3.605 million tons per year, demersal around 0.145 million tons per year, and shrimp, including squid around 0.128 million tons per year (Mulyono, et.al.2011). Pohuwato Regency is one of several new districts in Gorontalo Province. The Regency has marine fisheries resources which are used as the main capital for its development, especially in the Tomini Bay area. Fishing activities in Tomini Bay are relatively close to the coastline and are carried out in one-day fishing, using simple technology, so that the potential for large fish resources is not yet managed optimally. Most of the people of Pohuwato who live in coastal areas rely on fisheries and other coastal/marine resources as the main support for their livelihoods. The existing trends indicate that the potential of marine resources for the population of Pohuwato can still be developed far greater. Large potential of resources shows that many things must be done to realize this potential to become a reliable economic power. Low people's welfare, inefficient use of resources, and the existence of new trends that lead to damage to the

resources themselves are things that must be a serious concern of all stakeholders of these resources. In addition, fisheries sustainability policies made by the Regional Government have not been implemented by stakeholders and the community. Based on this, it is suspected that there is no shared vision between the Regional Government, stakeholders, and the community. Therefore, there is a need for fisheries management efforts that have the same objectives. To ensure the availability of fish resource stocks in water management is needed so that it does not only accommodate from an economic and technological perspective but also considers the ecological and biological aspects. According to Adrianto et.al. (2004), evaluation of the sustainability of a fish resource management policy should be carried out on ecological, social, economic, ethical, and institutional aspects in order to formulate objective management. The aim is to maintain food balance both for now and in the future. Fisheries resource management patterns are generally different for each country. Although these countries are likely to use the same approach.

This is very possible because the biological conditions of fisheries resources and their environment can vary in each country. (Boer and Azis, 2007).

Cochrane (2002) states that the general goal of developing fisheries economics through the development of fishing business includes 4 (four) aspects, namely resources (biology), technical, economic, and social. The objectives are:

1. To keep fish resources in conditions above the level needed for the sustainability of productivity.
2. To minimize the technical impact of fishing activities on the physical environment and non-target (by-catch) resources, as well as other related resources.
3. To maximize income AND to maximize employment opportunities for fishermen and the community at the site. According to Mulyono et.al.2011 that the principles of management and development of fisheries resources are as follows; first resource sustainability. Management and utilization of fisheries resources basically have a purpose to improve the welfare of the community. Therefore, the preservation of resources must be maintained as the main foundation for achieving that goal. Management and utilization Fisheries resources are expected not to cause damage to the fishing ground, spawning ground and,

nursery groundfish. In addition, it also does not damage mangrove forests, coral reefs and seagrass beds which have ecological links with fish. To implement the principle of sustainable resources, aspects of the use of fishing and cultivation technology need attention. The technology used should be environmentally friendly technology so that it does not cause a decrease in the carrying capacity of the environment and the emergence of social conflict in the community. Regarding the principle of sustainability, monitoring, control, and evaluation of the availability of fish resources must be carried out, including the conditions of the marine environment and pollution. Second, cultural preservation. Management and utilization of fisheries resources should pay attention to local wisdom/knowledge, customary law and other institutional aspects related to resource management. Third, economic principles. Management and utilization of fisheries resources should be able to contribute to improving community welfare and local revenue so as to be able to realize economic independence and justice. In order to achieve this, efforts are needed to evenly distribute and distribute fisheries resources efficiently and sustainably to the community without prioritizing a community group and marginalizing other community groups. Fourth, the principle of

participation. The management and utilization of fisheries resources will run well if it involves the participation of all relevant parties (stakeholders), namely the Regional Government, business world, NGOs, Universities, and the community. The participation of all parties will create a sense of ownership and responsibility to jointly preserve fisheries resources. Fifth, accountability and transparency. Management and utilization of fisheries resources must pay attention to aspects of accountability and transparency in their implementation. Accountability means that all policies and regulations issued by local governments in the management and utilization of fisheries resources must be accountable to the public. While transparency means that all political, public and regional regulations can be known by all levels of society, especially those related to the distribution and allocation of fisheries resources. This is important to realize a clean government and free from Community Service Program practices

II. METHODS

The research was carried out in the waters of Pohuwato Regency, Gorontalo Province. The research location is presented in Figure 1.

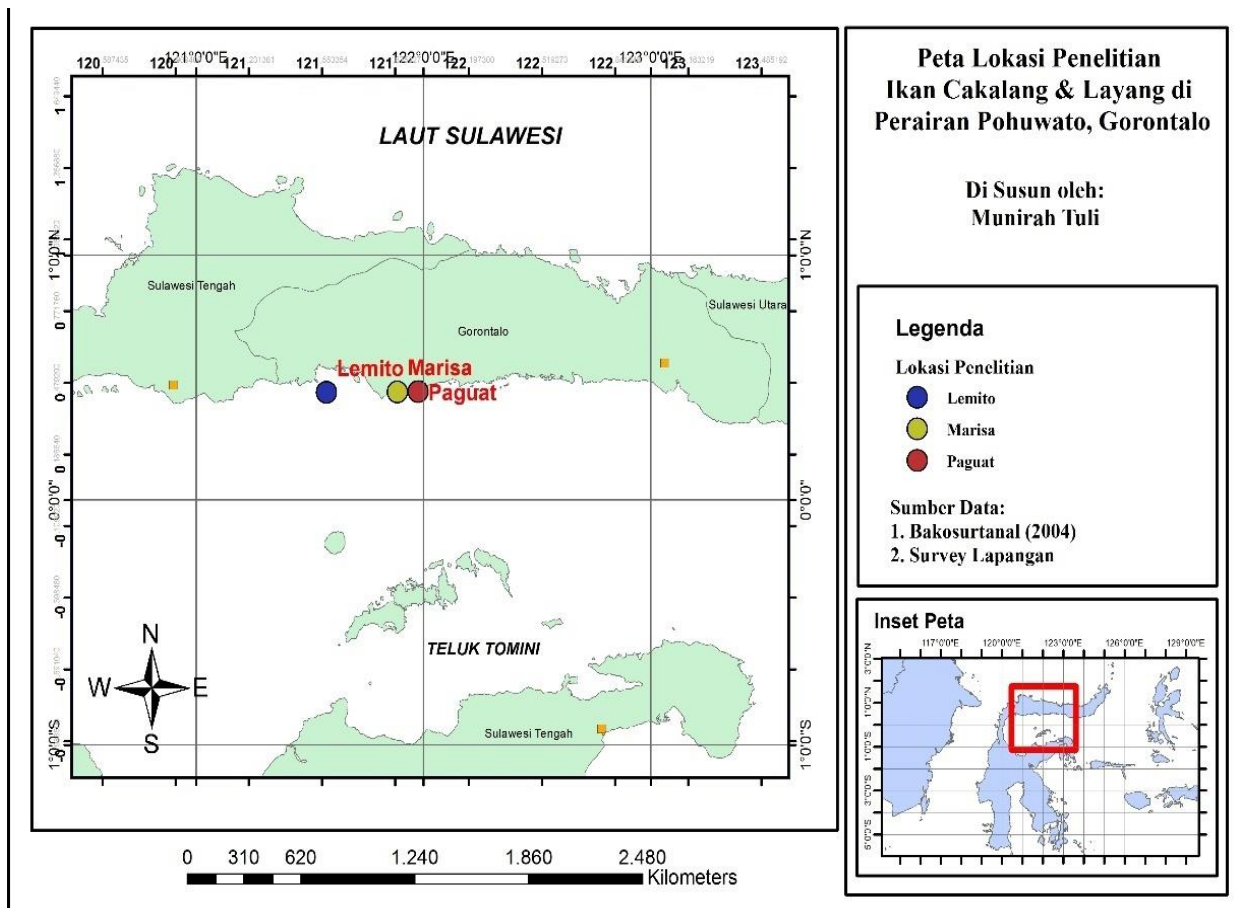


Fig:- 1 Map of the waters of Pohuwato Regency

The research method used is the field study method. Primary data regarding socio-economic aspects, obtained through interviews by filling out questionnaires by

respondents. Respondents consist of fisheries actors (fishermen/crew members, ship owners, collectors, TPI officers, and other stakeholders) and policymakers.

Questions/questionnaires in interviewing fisheries actors include respondents' identities, socio-economic conditions, business dynamics, respondents' perceptions of business sustainability, respondents' perceptions of management models. Data from policy-making respondents included: the identity of the respondent, the presence or absence of the Pohuwato District Government program that was directly related to the management of skipjack fisheries resources and perceptions of business sustainability indicators, and perceptions of fisheries resource management models (Table 1). Research techniques include personal interviews, observation, archiving data

and surveys through questionnaires. The use of questionnaires is useful for reducing deviations and extending the scope of respondents involved (Ivancevich et al. 2005 in Ross. 2011).

Respondents who were taken as the object of the study to assess the objectives of fisheries management, namely traders and policymakers were determined census. As many as 14 people from government service is related to fisheries management, 17 traders, 3 people, academics, and 3 people from Non-Governmental Organizations.

Respondents	Data type	Data source	Tools used
Fishermen catches, collectors, Fish Auction Places, and fish traders.	The Identity of respondents, length of business, number of family dependents, business dynamics, perceptions of business sustainability indicators, perceptions of fisheries resource management models	Interview / Insitu	questionnaire
Policy makers, in this case, are Pohuwato District Government, Marine and Fisheries Service, Regional People's Representative Council, Regional Planning Board of. Pohuwato Regency, Extension and Academics, and Non-Governmental Organizations.	Identity of respondents, Pohuwato District Government Program, perceptions of business sustainability indicators, perceptions of fisheries resource management models	Interview / Insitu	questionnaire

Table 1:- Types and socio-economic data sources

➤ *Fisheries Management Objective Analysis, with Conjoint*

- a. Designing stimuli by using the concept of orthogonality in reducing the combination of attributes with each level, using the ortho plan command aid in Statistical Product and Service Solution (SPSS). In this study, 16 attributes (m = 16) were used, and each attribute consisted of 3 to 4 attribute levels (k = 3 or 4).
- b. Data collection is done by distributing questionnaires to respondents.
- c. respondents were asked to choose the 4 most preferred choices from 16 presented. The design strategy presents all (16), acceptable without excessive information. Therefore, instead of displaying 2 or 3 alternatives on the card, several times, all alternatives are displayed together. Therefore, respondents have all alternatives obtained from one card to make their choice. Data for a set of choices consists of four observed options and the next twelve choices are not observed (Table 2).
- d. Assessing the reliability and validity of the model obtained by Pearson's R2 (multiple determination coefficient) values.
- e. Estimating the basic model of conjoined equations
- f. Determine the importance of an attribute and its relative importance with other attributes.

Information:

- U (X) = total utility or total
- aij = value of the use of the j-level attribute to i
- ki = number of levels from attribute to i
- m = number of attributes
- xij = doll variable attribute to i level j

- g. Determines the level of usability level

The level of utility level (HCV) is the importance of a level relative to other levels on an attribute. HCV can be predicted in several ways, including the regression of puppet variables with independent variables is the variable of the stimulated puppets that exist. Value one if the level of the attribute appears and is zero if the attribute level does not appear.

h. Determining Relative Important Values

Relative important values (NPR) are used to indicate the relative importance of an attribute to another attribute. Defined as the difference from the largest HCV value with the smallest value. According to Malhotra (2004). Information :

- Wi = Important relative value of the attribute to i
- Li = [max (aij) - min (aij)], for the attribute i
- M = Number of attributes

i. Interpreting the results of conjoint analysis of the preference data, so that we can know the management aspects of what is most important / very important to note. Where the interpretation is seen from the HCV and NPR values contained in the model. The higher the HCV value of an attribute level the more attribute level is preferred. Conversely, the higher the NPR value of an attribute, the more important the attribute is.

Conservation	Social economic	Allocation	Cards
<i>Sustainability</i>	<i>Profit</i>	<i>Fixed Gear</i>	<i>A</i>
<i>Sustainability</i>	<i>Fisher Employment</i>	<i>Geography</i>	<i>B</i>
<i>By Catch</i>	<i>Regional Employment</i>	<i>Inshore/Offshore</i>	<i>C</i>
<i>Sustainability</i>	<i>Regional Employment</i>	<i>Fixed Gear</i>	<i>D</i>
<i>Environment Quality</i>	<i>Regional Employment</i>	<i>Geography</i>	<i>E</i>
<i>Sustainability</i>	<i>Regional Employment</i>	<i>Inshore/Offshore</i>	<i>F</i>
<i>Sustainability</i>	<i>Safety</i>	<i>Geography</i>	<i>G</i>
<i>Environment Quality</i>	<i>Fisher Employment</i>	<i>Fixed Gear</i>	<i>H</i>
<i>Sustainability</i>	<i>Safety</i>	<i>Inshore/Offshore</i>	<i>I</i>
<i>Environment Quality</i>	<i>Safety</i>	<i>Inshore/Offshore</i>	<i>J</i>
<i>Environment Quality</i>	<i>Profit</i>	<i>Inshore/Offshore</i>	<i>K</i>
<i>By Catch</i>	<i>Fisher Employment</i>	<i>Inshore/Offshore</i>	<i>L</i>
<i>Sustainability</i>	<i>Profit</i>	<i>Inshore/Offshore</i>	<i>M</i>
<i>By Catch</i>	<i>Safety</i>	<i>Fixed Gear</i>	<i>N</i>
<i>By Catch</i>	<i>Profit</i>	<i>Geography</i>	<i>O</i>
<i>Sustainability</i>	<i>Fisher Employment</i>	<i>Inshore/Offshore</i>	<i>P</i>

Table 2:- Fisheries Management Objective Attributes

(Please select 4 cards that best represent the preferred combination of goals

Option 1 =

Option 2 =

3rd choice =

Option 4 = ...

Figure 2. Questions in Experiment Options with the Conjoint Method

III. RESULTS AND DISCUSSION

➤ Stakeholders' perception of fisheries objectives

The main factors that influence the development of pelagic fisheries in the waters of Pohuwato Regency are the potential of pelagic fish resources, market potential, human resources, facilities and infrastructure, the technology of arrest, season and supervision. The objectives to be achieved include sustainable fishing efforts, improved fishermen welfare, adequate facilities and infrastructure, sustainable small pelagic fish resources, marketing carried out in the waters of Pohuwato Regency, improved performance of Regional Government Apparatus, regional income increases. Options to be taken in the development of pelagic fisheries in the waters of Pohuwato Regency include the development of sustainable fishing technologies, increased fishing business productivity, development of Coastal Fisheries Ports and their accessibility, and human resource development.

Fisheries management at an early stage when the stock is still abundant aims at developing resource exploitation activities to maximize production and productivity. In the next stage when the utilization of fish resources begins to threaten the sustainability of these fish stocks because the more parties involved, fisheries management usually begins to pay attention to social (justice) and environmental elements so that the utilization of these resources can be sustainable, the strategies applied

at this stage are generally aimed at for conservation. Given that many aquatic resources are more captured and that existing fishing capacities endanger conservation and rational use of resources, then technological change aimed solely at further enhancing fishing capacity is generally seen as undesirable. Instead a precautionary approach to technological change aims to: (1) enhance the conservation and long-term sustainability of biological aquatic resources; (2) prevent damage that is not reversed or that is not acceptable to the environment; (3) increasing the social and economic benefits obtained from fishing and (4) improving the safety and working conditions of fisheries employees (FAO, 1995).

a. Design attributes for analysis of fisheries management objectives

By using a conjoint procedure, 16 cards were obtained which were a combination of various kinds of attributes regarding the objectives of fisheries management. The 16 cards can be seen in Figure 2.

b. Card probability

The combination of policies that are considered appropriate in the framework of fisheries management both for administration/ government, academics, non-governmental organizations and for fishermen and fish traders are as follows:

- Administration

The total respondents from the administrative/governmental circles surveyed were as many as 14 people from government Pohuwato Regency related to fisheries management. The results of the analysis of the importance of alternative policies regarding fisheries management objectives that were considered most important by the government were found in Table 3.

No	Card	Conservation	Social Economic	Allocation	Probability
1	K	<i>Environment Quality</i>	<i>Profit</i>	<i>Inshore/Offshore</i>	0.107
2	H	<i>Environment Quality</i>	<i>Fisher Employment</i>	<i>Fixed Gear</i>	0.090
3	P	<i>Sustainability</i>	<i>Fisher Employment</i>	<i>Inshore/Offshore</i>	0.082
4	E	<i>Environment Quality</i>	<i>Regional Employment</i>	<i>Geography</i>	0.078
5	B	<i>Sustainability</i>	<i>Fisher Employment</i>	<i>Geography</i>	0.077
6	J	<i>Environment Quality</i>	<i>Safety</i>	<i>Inshore/Offshore</i>	0.076
7	M	<i>Sustainability</i>	<i>Profit</i>	<i>Inshore/Offshore</i>	0.070
8	L	<i>By Catch</i>	<i>Fisher Employment</i>	<i>Inshore/Offshore</i>	0.062
9	F	<i>Sustainability</i>	<i>Regional Employment</i>	<i>Inshore/Offshore</i>	0.054
10	A	<i>Sustainability</i>	<i>Profit</i>	<i>Fixed Gear</i>	0.050
11	I	<i>Sustainability</i>	<i>Safety</i>	<i>Inshore/Offshore</i>	0.050
12	O	<i>By Catch</i>	<i>Profit</i>	<i>Geography</i>	0.049
13	G	<i>Sustainability</i>	<i>Safety</i>	<i>Geography</i>	0.047
14	C	<i>By Catch</i>	<i>Regional Employment</i>	<i>Inshore/Offshore</i>	0.041
15	D	<i>Sustainability</i>	<i>Regional Employment</i>	<i>Fixed Gear</i>	0.039
16	N	<i>By Catch</i>	<i>Safety</i>	<i>Fixed Gear</i>	0.027

Table 3:- Alternative Policies for Management Objectives by Local Governments

Source: Primary data (2013)

The results of the analysis above show that the most important policy alternative is fisheries management policies that pay attention to the quality of the aquatic environment. This is because it is able to generate profits for all parties involved and able to reduce conflicts that occur in coastal/offshore areas. This alternative policy is an alternative that has the highest probability value of 0.107.

- *Academics*

The number of respondents from the academics surveyed was 3 people. The results of the analysis of the importance of alternative policies regarding the objectives of fisheries management which are considered the most important by academics are in Table 4.

Number	Card	Conservation	Social Economic	Allocation	Probability
1	E	<i>Environment Quality</i>	<i>Regional Employment</i>	<i>Geography</i>	0.098
2	K	<i>Environment Quality</i>	<i>Profit</i>	<i>Inshore/Offshore</i>	0.088
3	J	<i>Environment Quality</i>	<i>Safety</i>	<i>Inshore/Offshore</i>	0.085
4	B	<i>Sustainability</i>	<i>Fisher Employment</i>	<i>Geography</i>	0.080
5	H	<i>Environment Quality</i>	<i>Fisher Employment</i>	<i>Fixed Gear</i>	0.076
6	P	<i>Sustainability</i>	<i>Fisher Employment</i>	<i>Inshore/Offshore</i>	0.072
7	G	<i>Sustainability</i>	<i>Safety</i>	<i>Geography</i>	0.066
8	F	<i>Sustainability</i>	<i>Regional Employment</i>	<i>Inshore/Offshore</i>	0.061
9	M	<i>Sustainability</i>	<i>Profit</i>	<i>Inshore/Offshore</i>	0.061
10	I	<i>Sustainability</i>	<i>Safety</i>	<i>Inshore/Offshore</i>	0.059
11	L	<i>By Catch</i>	<i>Fisher Employment</i>	<i>Inshore/Offshore</i>	0.047
12	A	<i>Sustainability</i>	<i>Profit</i>	<i>Fixed Gear</i>	0.046
13	D	<i>Sustainability</i>	<i>Regional Employment</i>	<i>Fixed Gear</i>	0.046
14	O	<i>By Catch</i>	<i>Profit</i>	<i>Geography</i>	0.045
15	C	<i>By Catch</i>	<i>Regional Employment</i>	<i>Inshore/Offshore</i>	0.040
16	N	<i>By Catch</i>	<i>Safety</i>	<i>Fixed Gear</i>	0.029

Table 4:- Alternative policies regarding objectives

Source: Primary Data (2013)

An important policy alternative by academics in fisheries management is a policy that pays attention to the quality of the aquatic environment, is able to maintain and even increase employment for the community and is able to reduce conflicts between ports or different geographical groups. This alternative policy is an alternative that has the highest probability value of 0.098

➤ *Non-Governmental Organization*

The number of respondents from representatives of non-governmental organizations surveyed was 3 people. The results of the analysis of the importance of alternative policies regarding fisheries management objectives that are considered most important by representatives of non-governmental organizations are listed in Table 5.

No	Cards	Conservation	Social Economic	Allocation	Probabilitas
1	E	<i>Environment Quality</i>	<i>Regional Employment</i>	<i>Geography</i>	0.195
2	K	<i>Environment Quality</i>	<i>Profit</i>	<i>Inshore/Offshore</i>	0.118
3	J	<i>Environment Quality</i>	<i>Safety</i>	<i>Inshore/Offshore</i>	0.092
4	F	<i>Sustainability</i>	<i>Regional Employment</i>	<i>Inshore/Offshore</i>	0.072
5	C	<i>By Catch</i>	<i>Regional Employment</i>	<i>Inshore/Offshore</i>	0.066
6	H	<i>Environment Quality</i>	<i>Fisher Employment</i>	<i>Fixed Gear</i>	0.066
7	D	<i>Sustainability</i>	<i>Regional Employment</i>	<i>Fixed Gear</i>	0.056
8	M	<i>Sustainability</i>	<i>Profit</i>	<i>Inshore/Offshore</i>	0.047
9	O	<i>By Catch</i>	<i>Profit</i>	<i>Geography</i>	0.047
10	G	<i>Sustainability</i>	<i>Safety</i>	<i>Geography</i>	0.040
11	A	<i>Sustainability</i>	<i>Profit</i>	<i>Fixed Gear</i>	0.037
12	B	<i>Sustainability</i>	<i>Fisher Employment</i>	<i>Geography</i>	0.037
13	I	<i>Sustainability</i>	<i>Safety</i>	<i>Inshore/Offshore</i>	0.037
14	P	<i>Sustainability</i>	<i>Fisher Employment</i>	<i>Inshore/Offshore</i>	0.034
15	L	<i>By Catch</i>	<i>Fisher Employment</i>	<i>Inshore/Offshore</i>	0.031
16	N	<i>By Catch</i>	<i>Safety</i>	<i>Fixed Gear</i>	0.026

Table 5:- Analysis of the importance of alternative policies regarding fisheries management objectives that are considered most important by representatives of non-governmental organizations.

Source: Primary Data (2013)

An important policy alternative by academics in fisheries management is a policy that pays attention to the quality of the aquatic environment, is able to maintain and even increase employment for the community and is able to reduce conflicts between ports or different geographical groups. This alternative policy is an alternative that has the highest probability value of 0.098.

• *Fishermen and Fish Traders*

The number of respondents from the fishing community and fish traders surveyed was 17 people. The results of the analysis of the importance of alternative policies regarding the objectives of fisheries management which are considered most important by fishing communities and fish traders are as follows:

No	Cards	Conservation	Social Economic	Allocation	Probability
1	K	<i>Environment Quality</i>	<i>Profit</i>	<i>Inshore/Offshore</i>	0.125
2	J	<i>Environment Quality</i>	<i>Safety</i>	<i>Inshore/Offshore</i>	0.098
3	E	<i>Environment Quality</i>	<i>Regional Employment</i>	<i>Geography</i>	0.091
4	M	<i>Sustainability</i>	<i>Profit</i>	<i>Inshore/Offshore</i>	0.077
5	F	<i>Sustainability</i>	<i>Regional Employment</i>	<i>Inshore/Offshore</i>	0.068
6	P	<i>Sustainability</i>	<i>Fisher Employment</i>	<i>Inshore/Offshore</i>	0.061
7	I	<i>Sustainability</i>	<i>Safety</i>	<i>Inshore/Offshore</i>	0.060
8	H	<i>Environment Quality</i>	<i>Fisher Employment</i>	<i>Fixed Gear</i>	0.055
9	C	<i>By Catch</i>	<i>Regional Employment</i>	<i>Inshore/Offshore</i>	0.054
10	O	<i>By Catch</i>	<i>Profit</i>	<i>Geography</i>	0.052
11	B	<i>Sustainability</i>	<i>Fisher Employment</i>	<i>Geography</i>	0.051
12	G	<i>Sustainability</i>	<i>Safety</i>	<i>Geography</i>	0.050
13	L	<i>By Catch</i>	<i>Fisher Employment</i>	<i>Inshore/Offshore</i>	0.049
14	A	<i>Sustainability</i>	<i>Profit</i>	<i>Fixed Gear</i>	0.043
15	D	<i>Sustainability</i>	<i>Regional Employment</i>	<i>Fixed Gear</i>	0.038
16	N	<i>By Catch</i>	<i>Safety</i>	<i>Fixed Gear</i>	0.027

Table 6:- Analysis of the importance of alternative policies regarding fisheries management objectives that are considered most important by fishing communities and fish traders

Source: Primary Data (2013)

From the results of the analysis above, it can be seen that the policy alternatives that are considered most important by the fishermen and fish traders are fisheries management policies that pay attention to the quality of the aquatic environment, are able to generate benefits for all parties involved and are able to reduce the coastal / offshore conflict. This alternative policy is an alternative that has the highest probability value of 0.125.

• *Whole*

As a whole, the alternative fisheries management policy that is considered most important by respondents is fisheries management policies that can provide benefits for all parties involved but still pay attention to the quality of the aquatic environment and are able to reduce conflicts among fishermen, especially conflicts that occur between fishermen in the waters of Pohuwato Regency (Table7)

No	Cards	Conservation	Social Economic	Allocation	Probability
1	K	<i>Environment Quality</i>	<i>Profit</i>	<i>Inshore/Offshore</i>	0.112
2	E	<i>Environment Quality</i>	<i>Regional Employment</i>	<i>Geography</i>	0.094
3	J	<i>Environment Quality</i>	<i>Safety</i>	<i>Inshore/Offshore</i>	0.088
4	H	<i>Environment Quality</i>	<i>Fisher Employment</i>	<i>Fixed Gear</i>	0.071
5	M	<i>Sustainability</i>	<i>Profit</i>	<i>Inshore/Offshore</i>	0.070
6	P	<i>Sustainability</i>	<i>Fisher Employment</i>	<i>Inshore/Offshore</i>	0.067
7	B	<i>Sustainability</i>	<i>Fisher Employment</i>	<i>Geography</i>	0.063
8	F	<i>Sustainability</i>	<i>Regional Employment</i>	<i>Inshore/Offshore</i>	0.063
9	I	<i>Sustainability</i>	<i>Safety</i>	<i>Inshore/Offshore</i>	0.055
10	G	<i>Sustainability</i>	<i>Safety</i>	<i>Geography</i>	0.051
11	L	<i>By Catch</i>	<i>Fisher Employment</i>	<i>Inshore/Offshore</i>	0.051
12	O	<i>By Catch</i>	<i>Profit</i>	<i>Geography</i>	0.050
13	C	<i>By Catch</i>	<i>Regional Employment</i>	<i>Inshore/Offshore</i>	0.048
14	A	<i>Sustainability</i>	<i>Profit</i>	<i>Fixed Gear</i>	0.046
15	D	<i>Sustainability</i>	<i>Regional Employment</i>	<i>Fixed Gear</i>	0.041
16	N	<i>By Catch</i>	<i>Safety</i>	<i>Fixed Gear</i>	0.028

Table 7:- Overall alternative fisheries management policies that were felt most important by respondents
Source: Primary Data (2013)

➤ *The level of importance of attributes in terms of fisheries management objectives*

The factor that has the highest importance in fisheries management is socioeconomic factors with an interest score of 0.393 or 39.3%. Factors that have the highest importance score are conservation factors with an interest

score of 30.8%. As for the allocation, the factor is a factor that has the lowest importance, which is only 29.9%.

The level of importance of each of the factors observed in fisheries management can be seen in Table 8.

Factor	Utility	Exp(Utility)	Part-Worth	Total
Konservasi				
<i>Sustainability</i>	-0.0675	0.935	0.092	0.308
<i>By Catch</i>	-0.3383	0.713	0.07	
Social Economic				
<i>Fisher Employment</i>	0.0595	1.061	0.104	0.393
<i>Regional Employment</i>	-0.0119	0.988	0.097	
<i>Profit</i>	0.0952	1.1	0.108	
<i>Safety</i>	-0.1429	0.867	0.085	
Alokasi				
<i>Offshore</i>	0.1627	1.177	0.115	0.299
<i>Fixed Gear</i>	-0.2569	0.773	0.076	
<i>Geography</i>	0.0942	1.099	0.108	
Total	10.213		1	

Table 8:- Interests in Fisheries Management

Pearson and Kendall's output correlation is to find out how high predictive accuracy is.

Pearson's R = .672	Significance = .0022
Kendall's tau = .487	Significance = .0049

Table 9:- The Output of Pearson and Kendall Correlations

In this measurement, the output of Pearson and Kendall correlations produces relatively strong numbers of 0.672 and 0.487 (above 0.5). This shows a strong relationship between estimates and actual, or there is high predictive accuracy in the conjoining process. Whereas the significance test of 16 correlations produces a significance of 0.022 (below 0.05)

The potential of fish resources in the waters of Pohuwato Regency is quite high, but has not been used optimally, both because the fishing gear factors used are still traditional, with the dominant fishing tools namely stretch fishing, lack of fishing ground information. So the catchment area is not far from the coastal area, which is only in the area around the Neritic zone, which has a water depth of above 100 meters. Depending on the fishing

season. So that it can be seen from the monthly seasonal index that fishermen have for skipjack and flying fish, the highest catch season index in June, August, and September. It is seen that RPUE of skipjack fish is much bigger than flying fish. One of the factors that cause this to happen is the price of fish. Skipjack which tends to be higher and more stable when compared to flying fish. So that the objectives of fisheries management are considered important for the waters of Pohuwato Regency, namely by observing the condition of the aquatic environment. Viewed from the score of importance, the attribute that attributes that have the highest importance score is energy quality with a score of 14.69%. This shows that respondents considered that fisheries management policies carried out should pay attention to the quality of the aquatic environment to be maintained. Considering that the waters in Pohuwato Regency are affected by waste from fishermen's milkfish ponds and the condition of mangroves that are already quite damaged. The next attribute that has the highest score is inshore/offshore with an interest score of 11.52%. The results of the score of interest for each attribute in fisheries management can be seen in Figure 3.

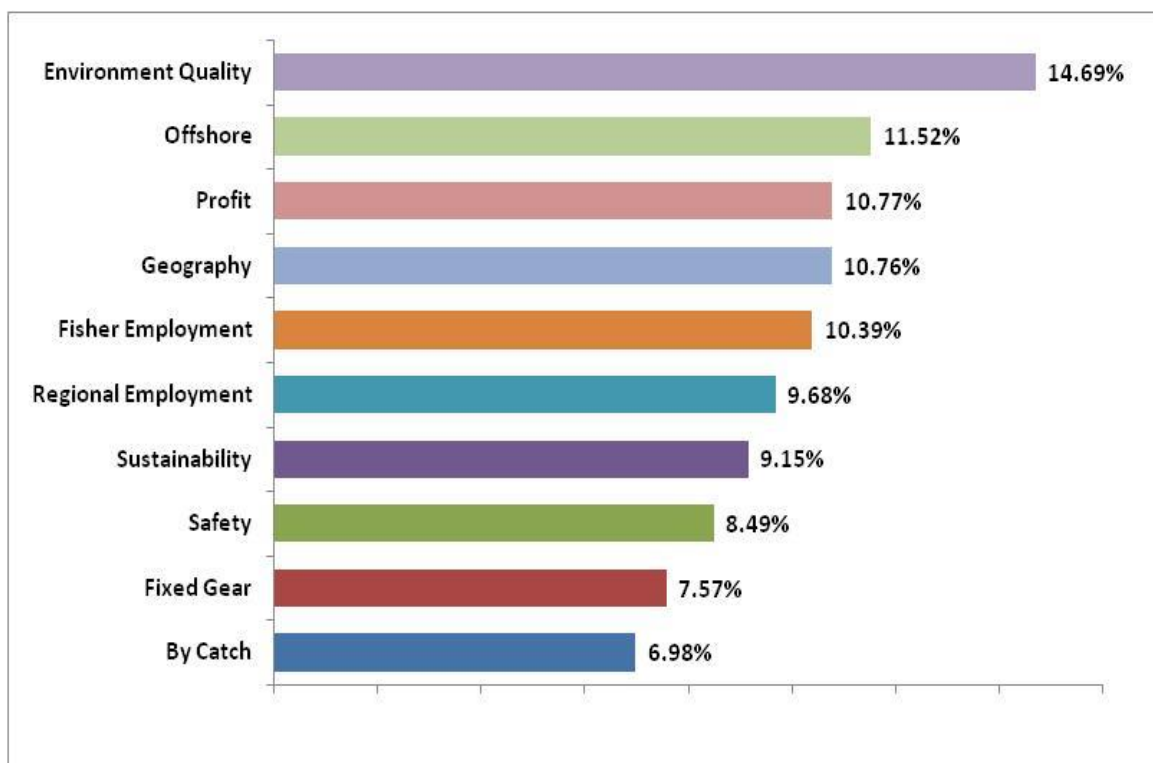


Fig 3:- A Score of the importance of each attribute in fisheries management in Pohuwato District

Apart from this great potential, the current conditions show that there are many things that must be done to realize this potential into an actual reliable economic power. Low community welfare, resource utilization that is not yet effective and even new trends that lead to damage to resources itself are things that must be a serious concern from all stakeholders of these resources. Coastal and marine management including fisheries resources in order to be sustainable according to (2000), must be carried out in an integrated manner both ecosystems and resources and

must also be integrated between institutions within the government. This integration model is a strong basis for supporting sustainable use of fisheries and marine resources. Adrianto said.et.al (2004), good management of financial and administrative aspects and organizing capabilities for the long term is a condition of sustainable fisheries development that can only be achieved in a management model that is strengthened by regulations.

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