ANALYSIS TECHNO-SOCIO-ECONOMIC RESULTS OF CAPTURE FISHERIES FISH SHRINKAGE MACKAREL TUNA (Euthynnus affinis) IN WATER DISTRICT PAMENGPEUK GARUT

Abdullah Naufal Luthfi[1], Atikah Nurhayati[2], Subiyanto[2], Asep Agus Handaka[2]

[1]) Faculty of Fisheries and Marine Sciences, University of Padjadjaran
[2]) Staff Faculty of Fisheries and Marine Sciences, University of Padjadjaran
Fisheries Studies Program, Faculty of Fisheries and Marine Sciences, University of Padjadjaran
Jl. Raya Bandung - Sumedang Km 21, Jatinangor 40600
E-mail: Abdulahnaufal995@gmail.com

ABSTRACT

This study aims to analyze Techno-Socio-Economic Losses of Fisheries Catch Mackarel Tuna (Euthynnus affinis) in the waters of Pameungpeuk Garut, This research was conducted in January until the month of July 2019 in Garut. The method used is a case study (case study) and surveys. Respondents retrieval techniques used in this research is a snowball sampling technique. Snowball sampling is a method for identifying, selecting and taking respondents on a network or chain of ongoing relationships, the selection of key informants who were randomly assigned to provide information in accordance with the purpose of research. Analysis of the data used in this research using Likert Scale and Multiple Linear Regression in data processing techniques, the authors use a scale of measurement obtained from the respondents. The results showed thatThe most significant factor affecting the amount of shrinkage of the Mackarel Tuna catchesin waters Pameungpeuk Garut which is sorting fish in fish sorting is done in terms of the quality grading, shelf life and size of fish,

Keywords: *Mackarel Tuna Fish, Fishing, Fish Lost*

INTRODUCTION

Garut Regency is located at position 6o57'34 "LS - 7o44'57" LS and 107o24'3 "BT - 108o24'34" BT. Garut has the administrative area of 306,519 hectares (3065.19 km²) with the ocean and the beach. Garut has a long coastline that stretches approximately 80 km in the southern region includes the District Caringin, Mekarmukti, Bungbulang, Pakenjeng, Cikelet, Pameungpeuk and Cibalong. South beach Garut is one area that is included in the Regional Fisheries Management Zone or WPP-RI 573, covering the Indian Ocean. Bodies Pameungpeuk is one area that is included in the Regional Fisheries Management Zone (WPP) 573 (Regulation of the Minister of Marine and Fisheries No.01 / MEN / 2009).

Fish resources in coastal Garut Exclusive Economic Zone (EEZ) with an area of 28 560 km2 ± arrest. Commonly caught fish include Mackarel Tuna, mackerels, Mackarel Tuna, squid, layur, snapper, black pomfret, grouper, baronang, shark bottle and lobster. Besides fish, there is also a considerable potential seaweed (Department of Livestock Fisheries and Marine Garut 2013). Pameungpeuk district has an area of approximately 4176.1 Ha2. The population of District Pameungpeuk in 2017 as many as 41 878 people, consisting of 21 126 men and 20 752 women, with the number of households by 12 513 households, with the number of inhabitants or household members per household between 3 to 4 people. This obviously greatly affect the burden of every household, dependents of the household,

Fish resources is a resource that can be recovered (renewable resources) and based on marine habitats can be broadly divided into two groups, namely the type of pelagic and demersal fish. Pelagic fish are a group of fish that are on the surface layer to the water column and has a main characteristic, namely in the move always form schools (schooling) and migrate to various necessities of life. Pelagic fish by size can be divided into two parts, namely the large pelagic fish, such as the type of Mackarel Tuna, skipjack, Mackarel Tuna, and others, as well as small pelagic fish, such as flying fish, anchovies, mackerel, and others. This classification is intended to facilitate the use and management, due to the different character of the activity of both groups of these fishes (Nelwan 2004).

Mackarel Tuna (Auxis thazard) is a large migratory pelagic through the waters of the Indian Ocean in search of food and warmer temperatures. The population of swordfish in the waters of the southern Garut always there throughout the year due to the availability of sufficient food

resources. In the food chain, food swordfish are anchovies and squid (Widajanti et al., 2004). Fisheries included in economic activity is unusual, no one can predict the production of fishery products because it is a very complex, so that the system of fisheries under uncertainty. According to Charles (2001), there are two sources of uncertainty in the fishery system that is the source of a natural and derived from human sources and management.

Mackarel Tuna has an important economic value and dominant in the waters of the southern Garut and can be a source of income for local communities to improve their quality of life. However, fishery resources and marine very complex, where the nature of the resources is very fugitive resource (resource moved on), the complexity of the biological and physical water, as well as the right of ownership (common property resource), so that the interaction of these factors result in possibility of overfishing, the decline in the stock of resources, ecological damage, which in turn greatly affect the lives of fishermen (Sinulingga 2009).

The number of fishermen in the District Pameungpeuk in 2016 amounted to 970 people (Garut District Agriculture Office 2016). Fishing activities take place throughout the year with the harvest during the months of June to September (east monsoon). The fishing communities in Pameungpeuk generally catch Mackarel Tuna which is the dominant species of fish caught in waters Binuangeun (TPI Cilautereun 2012). However, efforts are still not optimal utilization. In determining the fishing (fishing ground), fishermen generally still use natural instinct to hunt manner (hunting) schools of fish, so that the fishing effort is less effective and efficient. The level of uncertainty of the catch is quite high, because the fishermen do not know the potential sites for fishing.

The majority of fisheries activities in the area of PPP Cilauteureun Pameungpeuk district including small-scale fisheries. One characteristic of fishing activities carried out small-scale fishing is the use of technology and equipment in fishing still modest and limited to the fishing area (fishing ground) is limited in the area around the beach. In contrast to the pattern of other businesses, revenue from the work done by fishermen tend to be irregular. Fishermen in the operations has never had an idea of the amount of revenue to be earned. Fishing effort for fishermen is the art of hunting that is difficult to predict the outcome. One day, fishermen have big revenue at the time of the season when the west but east monsoon (famine) fishermen have no income at all (Najib 2000). In terms of human resources, the majority of small-scale fishery business has not been supported by a skilled workforce

and educated, generally only graduated from elementary school (SD) armed with the skills acquired from generation to generation. In terms of any capital, faced with the difficulty of fishing effort to access capital from the banking sector due to the low confidence of this sector of the fishing effort. The condition becomes one barrier socio-economic aspects of fishermen to increase the scale of business, as a source of capital comes mostly from its own capital, family or relatives (Koeshendrajana 2015). the majority of small-scale fishery business has not been supported by a skilled workforce and educated, generally only graduated from elementary school (SD) armed with the skills acquired from generation to generation. In terms of any capital, faced with the difficulty of fishing effort to access capital from the banking sector due to the low confidence of this sector of the fishing effort. The condition becomes one barrier socio-economic aspects of fishermen to increase the scale of business, as a source of capital comes mostly from its own capital, family or relatives (Koeshendrajana 2015). the majority of small-scale fishery business has not been supported by a skilled workforce and educated, generally only graduated from elementary school (SD) armed with the skills acquired from generation to generation. In terms of any capital, faced with the difficulty of fishing effort to access capital from the banking sector due to the low confidence of

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Some of the risks inherent in the fishery business can be classified into natural risk, price risk and technology risk. Natural risk, namely the risk due to natural conditions, is usually the factor that causes production risks such as the occurrence of a storm or cyclone; price risk, namely the price of the catch is not as expected, it can also occur because there is a game middlemen or abundance of the catch; technology risk, namely the changes that occur by the rapid advances in technology, it can also encourage the emergence of

uncertainty both on the production and the price (Ritonga 2004). One of the risks in losses to fishing is fishing or post-harvest loss of fish (PHF) is a decrease in the number of fishery resources that can be consumed, occurs within the distribution chain marketing, associated with the input capture fisheries production, post-harvest handling, processing and marketing (collecting traders, wholesale and retail). Depreciation result in post-harvest fisheries are common and cause losses for fishermen, depreciation results in a loss of post-harvest fisheries are the result of including the physical state of fish stocks, the financial losses and the quality of the catch.

In a supply chain at every stage can occur a loss, of post-harvest to the consumer. From preproduction, production, management to marketing structured in a series of fishing activities carried out within a system of fishery business. In the early stages of pre-production, the characteristics of seasonal fishery products cause post-harvest losses during the arrest. Due to the production level of fishing is generally fluctuates and depends on weather patterns arrest the imbalance between demand and supply was also an increase in stock supply of fishery products during the peak season, so the absorption of the crops in the market decreased by penururan accompanied by consumer prices. This is a frequent case in the pre-production stage. At the production stage to marketing, product characteristics perishable fishery

increase the risk of loss if the appropriate treatment is not carried out until the stage of product distribution to the end consumer.

From the above events can be underlined the need for precise handling to reduce losses, it aims to increase the supply of fish to meet the needs of fish stocks at the same time consumption implement a better management system, not only to increase the value of the catch alone. The most obvious way to increase the supply of fish, even without an increase in landings, is to reduce the loss of what is currently captured, further attention should be given to reducing losses (Nurhayati et al. 2018)

Therefore, the effort to reduce or prevent the loss can not be separated from the condition of a number of factors, which can be categorized as a factor of socio-techno-economic. With this in mind, the purpose of this study is to analyze the factors that affect the shrinkage of fisheries, focusing on three aspects, namely social and economic engineering.

RESEARCH METHODS
Place and Time Research

Research has been conducted in Garut, in the institution - the following agencies; Department of Fisheries Garut Regency, Fish Market, and PPP Cilautereun. This research process will be conducted from January to July 2019

Data Collection Methods

The method used in this research is a case study (case study) and surveys with unit case at the fish auction (TPI) in the area of Water Pameungpeuk, Garut.

Respondents retrieval method

Respondents retrieval techniques used in this research is a snowball sampling technique. Respondents consisted of a group of fishermen, traders and consumers. Exploratory Pendeketan Fish Loss Assessment Method (EFLAM) adapted as the questions in the survey.

Data analysis method

Analysis of the data used in this research using Likert Scale in a data-processing technique, the author uses a scale of measurements obtained from the respondents in this research is the Likert scale with the formula index% and using the interpretation of a score based on the interval according to table 2, and is researching non-experimental wherein the analysis used a descriptive quantitative. Analysis of the data consists of data editing, tabulation and percentages set forth in the form of tables and graphs. Operational variables studied are based on the analysis of the factors that affect the loss of fish based on aspects of the Techno-Socio-Economics.

RESULTS AND DISCUSSION

Condition Aspects of Capture Fisheries Technology

Conditions technological aspects of fisheries in District Pameungpeuk conducted to determine how the condition of the various aspects that influence each fishing activity takes place, to be seen circumstances, function and sustainability in fisheries. Analysis of fisheries technology is seen from three factors conditions include: Condition of fisheries vessels, fishing gear and handling conditions fish catching results calculated using a Likert scale withinterpretation of the score is based on the interval number 0% - 19.99% is not good, the figure of 20% - 39.99% less, the rate of 40% - 59.99% is good enough, the figure of 60% - 79.99% better, and figure 80 % - 100% excellent,

Fishing Vessel Condition

Results of capture fisheries production in Sub Pameungpeuk certainly influenced by the performance of ships, machinery and other necessary requirements in fisheries activities, therefore the analysis of the condition of these things need to be known condition. Based on the results of field observations in District Pameungpeuk overall fishing boat outboard engine with engine sizes 15-40 PK, with the ship vessel sizewhich has a length of 9 meters, width of 1.2 meters and a height of 80 centimeter (P = 9m; L = 1,20m; T = 80cm). Umumya outboard engine is a type of

2-stroke motot, whose characteristics are easy to install and easy release of the ship and also in operation (Soenarta 1995).

Table 1. Conditions Fishing Boat

No.	Variable Conditions Ships	Index
1	Condition of the ship in arrests	69.5
2	Conditions catching vessels run time engine	65
3	The size of the ship and boat engines in the catch	53
4	Availability of supporting tools arrest	52.5
5	Port state fishing vessels	35
Average - Average Index		**55**

In Table 1 above shows that the condition of the ship's fisheries District Pameungpeuk analyzed according to the condition of the vessel in the arrest, arrest the ship's engine condition while running, and engine size of the ship in the results, the availability of supporting tools arrest and port state fishing vessel having the mean average index of 55, which means in fairly good condition. But at the state port fishing vessel has an index value 35.00, which means less good and it is the lowest index value compared with other indices. This is because the state of the fishing vessel port deteriorating situation is with

the groove along the harbor silting, caused by sediment supply from the shore. Silting process often caused by changes in the balance of coastal areas diakibatkkan by human activities such as the development of land areas along the coast and construction of coastal structures to be one factor contributing to the silting (L. Arifin 2003).

Figure 1. Graph Catching Vessel Condition
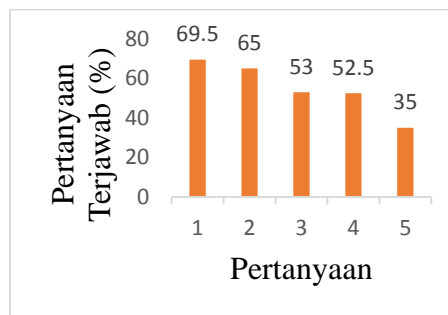
In Figure 9 graph above shows that the state of the fishing vessel port at the lower end when compared with the availability of supporting tools arrest, the size of the ship and boat engines in catches, catching boat engine condition when it is run and the condition of the vessel in making arrests. Condition of catching vessels have the highest index value with a value of 69.5, which means in good condition.

Catching Vessel Condition

Fishing gear is also a primary requirement required by fishermen in the arrest, therefore it is necessary also the review of the use of fishing gear used by fishermen of both aspects of eligibility, conditions and

sustainability. Based on observations in the field of fishing gear used by fishermen in Pameungpeuk ranging from fishing gear, sirang nets, gill nets and nets indecent. Pameungpeuk fishing gear used by fishermen in the fishing season is in the summer, such as Mackarel Tuna which are caught by gill net fishing gear or obscene

Table 2. Condition Capture Device

No.	Variable Conditions Capture Device	Index
1	Conditions fishing gear	77.5
2	The effectiveness of the fishing gear	68
3	Determination of rules of use of fishing gear	56.5
4	Prices of fishing gear are in accordance with the needs	66
5	Maintenance of fishing gear	72.5
Average - Average Index		**68.1**

According to the table 9 above conditions Pameungpeuk District fishing gear to the determination of regulations fishing gears have unfavorable index value with a value of 56.5. This is because according to the fishermen Pameungpeuk themselves are still many fishermen are using prohibited fishing gear and arresting protected species, therefore its index value can be said to be less well

Conditions fishing gear in District Pameungpeuk has custody has an index value of 72.5 which is said to be good, it is because most fishermen in Pameungpeuk pertiap replace his fishing gear or a fishing season can be said to make the turn gear annually. Prices gear in fishing trip needs also has a good index value of 66 due in accordance with the needs of fishermen who only buy the fishing gear to his needs pertiap fishing season only. Prices gear also supported along with the effectiveness of the fishing gear used to catch swordfish based index value of 68. The effectiveness of fishing gear seen from the value of production of Mackarel Tuna fishing with fishermen production results in the fishing season can produce a minimum of 50kg-100kg Mackarel Tuna once to trip. The average yield indices obtained on the condition of fishing gear with a value of 68.1 means fishing gear used in the District Pameungpeuk in good condition.

Figure 2. Graph Capture Tool Condition
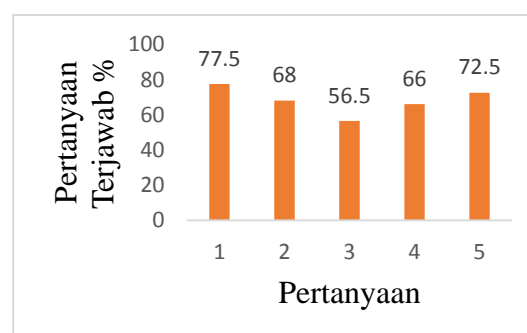
In Figure 2 above shows that the adoption of legislation is lowest in fishing gears have a value of 56.5 and has the highest

index value is in the condition of fishing gear 77.5. Among the lowest and highest value of the index is no value next to each other is not much different from an index value of the effectiveness of gear with the price of fishing gear that has an index value of 68 and 66.
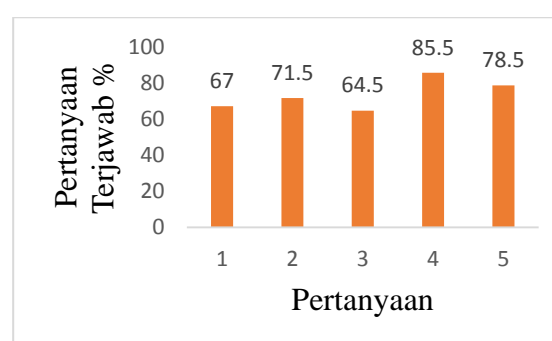
Fish Handling Conditions

Handling fresh fish is one important part of the chain of fisheries indrustri. Handling of sea fish basically consists of two phases, namely the handling on ships carried out by fishermen and ground handling is done by collectors. Fish is a commodity which is susceptible to damage and deterioration. The importance of quality of fishery products listed in 52A / KEPMEN-KP 2013 is the implementation of cold chain system (cold Shain system) since the fish were on board. In addition to fishing vessels and gear handling of fish are also important factors in minimizing terjadina shrinkage or loss results in Mackarel Tuna fisheries. Under conditions of fish handling consists of a range of variables including: Handling of fish by fishermen sesuaai with the SOP, the fulfillment dakam tools and materials handling,

Table 3. Fish Handling Conditions

No.	Variable Handling Fish	Index
1	Handling of fish by fishermen in accordance with SOP	67
2	Fulfillment of tools and materials in the handling of fish	71.5
3	The quality of the fish when landed in ports	64.5
4	Fishing knowledge about the handling is good and right	85.5
5	Handling the fish continues to run well in the absence of Fish Auction Sites	78.5
Average - Average Index		73.4

Based on the above table 3 fish handling condition variable has an average index value of 73.4 means by fishermen in fish handling Pameungpeuk treatment is good and effective. Can be considered effective and have good views of data from field observations showed shrinkage value low yields of about 5% -30% of the total catch.

Figure 3. Fish Handling Conditions

In Figure 3 above the highest index at 85.5

with a variable value of the knowledge of fishermen on fish handling is good and right, it is supported for collectors only receive the catch in fresh condition it and cause fishermen should be able to know how to keep their catch swordfish hasi fresh on the Saar landed. This is consistent with the calculation results of interviews to fishermen in Pameungpeuk District.

Social Aspects condition Fishing
Social conditions

Sociodemographic derived from the social and demographic, social where nondemografi having components such as education, employment, and others. Demography is the study of residents in an area, especially regarding the amount, structure (age, religion, gender, etc.) as well as the process of change (births, deaths, marriages, etc.). Fishermen in Pameungpeuk District has a diverse age, education level and work experience is different. Pameungpeuk fishing conditions in the district are as follows: the highest age group of fishermen in Pameungpeuk is 51-65 years with a percentage of 33% and the lowest percentage is in the age of 30-35 years with a percentage of 10%. Age of fishermen can affect the level of fishing experience in carrying out fishing activities, Pameungpeuk fishermen dominated education graduates at primary school level by 68% and amounted to 18%

for junior high and high school / vocational 15%. Based on the questionnaire found that most fishermen are not too serious in school because they prefer to work and there is a cost issue for fear of a troublesome burden on families if the children in school, fishing in Pameungpeuk has diverse work experience, where work experience is lowest on work experience during the 1-10 years with a percentage of 25% and there the longest experience in> 41 years with a percentage of only 2%. Work experience with the highest percentage is in 11-20 years of work experience. Based on the questionnaire found that most fishermen are not too serious in school because they prefer to work and there is a cost issue for fear of a troublesome burden on families if the children in school, fishing in Pameungpeuk has diverse work experience, where work experience is lowest on work experience during the 1-10 years with a percentage of 25% and there the longest experience in> 41 years with a percentage of only 2%. Work experience with the highest percentage is in 11-20 years of work experience. Based on the questionnaire found that most fishermen are not too serious in school because they prefer to work and there is a cost issue for fear of a troublesome burden on families if the children in school, fishing in Pameungpeuk has diverse work

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Institutional Social Conditions of Fishermen

Of all fishermen who were respondents in Pameungpeuk entirely become active members of the group Rukun Fisherman. Awareness of the importance of the information is in the group of fishermen that the reference they are to take part in the group, one of the functions of the group Pillars of Fishermen It is to become a bridge or mediator between the voices and aspirations of the fishermen on world fisheries with

government agencies such as the Department or Ministry , It was the other way around where if the government provides assistance intansi the Rukun group fisherman who became a bridge between fishermen and governments.

Social Conflict Conditions Fishermen

The results of the questionnaires is known that the conflict was found on the implementation of the fishing effort gill net fishing gear and nets indecent. Conflicts caused by the operation of gill net fishing adverse indecent. Technical operation of the gill net is to spread it out and let it float on the water surface with the aid of a float, while net sirang operated bottom of the ballast underneath and rope ris as buoys and markers so that when the gill net operated following the ocean currents can be caught in the rope ris buoys nets sirang and resulting in severance bookmark at the same rope rope nets pelampug sirang so there was ghost fishing, in the absence of accountability of gill net fishing net loss sirang,

Fishermen and middlemen are interconnected in fishing activities, the middlemen as financiers would be the main subject of fishermen to make the trip. Capital provided middleman in the form of ships, fishing equipment or logistics such as gasoline, food or ice cubes. It is arguably beneficial for fishermen because

of the lack of investors or cooperatives that can be lent by fishermen. But it is also impacted by the sale price of fish is sometimes up and down, sometimes middlemen buy fish caught by fishermen with low prices and are not in accordance with the issued capital of fishermen.

Economic Conditions Fishing

Average catches of swordfish in the District Pameungpeuk current fishing season in one trip can menghasilakn 100 kg of Mackarel Tuna. Catches of swordfish are influenced by the seasons, fishing areas, the number of fishing gear and the large capacity of the ship. Total catch average-sized vessels 15 HP outboard engine is ± 100 Kg. Fishermen catch landed is immediately taken to a middleman for sale.

Revenue per vessel is influenced by the amount of catches of Mackarel Tuna and Mackarel Tuna selling price per kilogram (kg). Tongol commodity prices fluctuate depending on the season and the amount of production in kilograms cob. The greater the production / stock swordfish then the selling price will be cheaper as well as vice versa.

The results of the questionnaire showed differences in income among fishermen value is also influenced by whom the Mackarel Tuna was sold for

each collectors have different prices with a price range of Rp 7,500 to Rp 15,000 / kg.

Revenue per each fisherman is obtained by calculations based on the sharing system that is applied between the owner of the ship with the crew. Profit-sharing system applied is the ratio between the ship owner and crew to value ratio of 40:60. The division obtained by dividing the net profit of the ship that is raman / production value less costs in one trip. Income of fishermen classified into two groups: group revenues of more than 2 million / month and less than 2,000,000 / month. The difference is due to the diversity of the work of fishermen in Pameungpeuk. Income for fishermen is in group> 2,000,000 / month is a fisherman who has dual professions such as entrepreneurship, farming, farming or tourism workers.

Analysis Marketing Channels

Swordfish in the marketing channel is the channel most Pameungeuk short because it is not through a group or retailers. This channel is only involve fishermen were a bit much given capital by collectors, so that the catch directly given to the mediator, while the mediator is very thorough in terms of treatment, sorting and grading of fish, so the fish are sold to large traders say the quality is good, wholesalers

do not sell fish to retailers but directly to the final consumer or market.

Analysis of Factors Affecting Results Losses

Table 4. Factors Affecting Result Losses

Model	Coefficients unstandardized		standardized Coefficients	T	Sig.
	B	Std. Error	beta		
Constant	57.258	3,838		14.920	,000
Quality fish	-,039	2,478	-,004	-,016	,987
The price of fish	-,134	1,934	-,012	-,069	,945
size of fish	-1.018	2,021	-,088	-,504	,618
Shelf Life	-1.428	2,310	-,136	-,618	,541
fishing season	-1.648	2.645	-,162	-,623	,538
sorting fish	-5.646	2,239	-,551	-2.521	,017

1

No.	variables	t Count
1.	Quality Fish	-, 016
2.	Fish prices	-, 069
3.	Fish size	-, 504
4.	Age Save the Fish	-, 618
5.	Fishing season	-, 623
6.	sorting Fish	-2.521

Coefficient of the amount of shrinkage results Mackarel Tuna obtained generate value 57.258 this means that

alleged that the amount of shrinkage of fish catches in District Pameungpeuk tends to increase, which is influenced by the decrease in fish handling such as poor quality of fish, lack of sorting the fish during the fishing season that also affect Mackarel Tuna prices in the market. Broadly speaking, the amount of shrinkage of the result of this increase will be influenced - penduganya factors or independent variables.

To value the significance of the results, will be based on the extent used, in this study the level of significance or value of α used was 0.05 or 5%. From the results of the smaller significance of α is sorting the fish for, it means sorting fish 017 is the independent variable that significantly affect the amount of shrinkage results in Pameungpeuk District. Unlike the other independent variables that have a value greater significance dibadingkan α which means not having a significant effect on shrinkage results in Pameungpeuk swordfish.

R Square

Table 5. R Square

R square obtained from this model is equal to 0.84, meaning that 84% of variables - variables can affect the amount of shrinkage estimators and the results of the remaining 16% is the influence of other variables that are not incorporated into the model or can be explained in error.

This result is close to one and it can be said that the models are formulated to explain the influence of independent variables with the dependent variable.

Test F

Test F yield calculated F value of 30.84 with F table 2,49 answer the hypothesis that F count> F table and stated that H0 rejected and H1 accepted. Then alleged at least one independent variable in the model that include (1) the quality of the fish, (2) the price of fish, (3) the size of the fish, (4) a shelf life of fish, (5) fishing season, and (6) sorting fish significantly affect the dependent variable value Mackarel Tuna shrinkage results in District Pameungpeuk

Table 6. Test F

Model	Sum of Squares	Df	mean Square	F	Sig.
Regression	3333.151	6	555.525	30.844	0,00b
1 residual	594.349	33	18.011		
Total	3927.500	39			

Test T

From the results of the t above can be compared with t table of 1.691. In order to get the independent variables that have an influence on the result of shrinkage is

sorting swordfish with t value of 2.521. This value is stated that t> t table which means that H0 rejected and H1 accepted. It can be concluded that there is a significantly influence fish sorting significantly to the value of Mackarel Tuna shrinkage results.

Influence Factors Affecting Results of Mackarel Mackarel Tuna Losses

Quality Fish

Quality Mackarel Tuna in guarded Pameungpeuk very good quality because the middleman only accept Mackarel Tuna in fresh condition and are of good quality. Swordfish easily obtained by fishermen because it has big resources and also has an economic value for the local population, the price of Mackarel Tuna has kualiatas well when the stock market there will be high and vice versa when the market have in stock a lot of it will reduce the the price of swordfish, although in the same good quality. How to maintain the quality of the Mackarel Tuna fishermen catch them provide fiber box / sterofoam on board and have filled the box with ice blocks in order to keep the catch fresh fish.

Fish prices

From the results of the calculation, the value of the variable coefficient Mackarel Tuna price is equal to (-0.134 / inverse). The value obtained is negative.

This means that any increase in the price of Mackarel Tuna 1%, it will decrease the value of shrinkage result amounted to 0.134%. T value obtained from a value greater than the t table this means the price swordfish have real influence in susutnya value changes.

Fish size

Calculation resulting from the variable coefficient value of fish size is equal to (-1.018 / inverse). The value obtained is negative. This means that any increase in the value of the variable size of the fish by 1% will decrease the value of the Mackarel Tuna shrinkage results of 1.018%. T value obtained from a value greater than the t table this means sorting the size of the fish have a real impact in changes in the value of shrinkage results.

Age Save the Fish

Calculation resulting from the variable coefficient value of freshwater fish prices in the country amounted to (-1.428 / inverse). The value obtained is negative. This means that any increase in the value of the variable fish shelf life of 1% will decrease the shrinkage results of Mackarel Tuna by 1,428%. T value obtained from a value greater than the t table this means handling the shelf life of Mackarel Tuna catches have real influence in the amount of shrinkage catch.

Catching season

From the results of the calculation, the value of the variable coefficient fishing season is equal to (-1.648 / inverse). The value obtained is negative. This means that any increase in the value of the variable fishing season of 1% will decrease the value of shrinkage results of swordfish by 1,648%. T value obtained from a value greater than the t table this means Mackarel Tuna fishing season have a real impact in changing shrinkage results.

Sorting Fish

The research result shows the significant value of the variable sorting fish in this matter has the most significant value that is equal to, 017. This means that the value obtained is less than α of 5% or 0.05 that is considered as a variable that mamiliki most significant value that can affect the change in the value of Mackarel Tuna catches shrinkage. More and enactment of appropriate sorting fish will be the most influential factor yaang to reduce shrinkage value of Mackarel Tuna catches occur in Pameungpeuk.

CONCLUSION

Tekno-based research analysis Socio-Economic In Mackarel Tuna Fish Fishing Losses (Euthynnis affinis) Waterway Pameungpeuk Garut, then the conclusion obtained isfactors - factors that affect shrinkage Mackarel Tuna catches include

quality Mackarel Tuna, fish prices, the size of the fish, the shelf life of fish, the fishing season, and sorting penangk.apan swordfish. The most significant factor affecting the amount of shrinkage of Mackarel Tuna catches are sorting fish where the fish sorting in the grading done in terms of quality, shelf life and size of the fish. This shows if fishermen consider and implement sorting fish properly then, the smaller the amount of shrinkage catches of Mackarel Tuna landed, so as to minimize the loss of fishing effort on the cob Pameungpeuk District, Garut regency, West Java province.

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