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FISHERMAN RESOURCE MANAGEMENT STRATEGY FOR ECONOMIC RECOVERY POST EARTHQUAKE AND TSUNAMI IN DONGGALA DISTRICT, CENTRAL SULAWESI PROVINCE

Strategi Pengelolaan Sumberdaya Nelayan Untuk Pemulihan Ekonomi Pasca Gempa Bumi Dan Tsunami Di Kabupaten Donggala Provinsi Sulawesi Tengah

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ABSTRACT

The condition of fisheries production in Donggala Regency experienced a significant decline due to the earthquake and tsunami in 2018. After the disaster, the government made various rehabilitation efforts to restore the local economy. The aim of this research is to determine the government and fishermen's strategies in increasing income after the earthquake and tsunami disaster. The method used is qualitative descriptive data analysis. The results of the study show that before the earthquake and tsunami, coastal fishing communities relied entirely on fishing activities at sea to meet their living needs. The average income of fishermen respondents affected by the earthquake and tsunami reached IDR10,383,775. This figure was obtained from the average receipt of IDR168,404,125 after deducting the average total costs recorded at IDR158,020,350. The government's strategy to increase fishermen's income after the earthquake and tsunami includes providing assistance to fishermen, empowering and training fishermen, developing fisheries cultivation, improving infrastructure, increasing market access, and collaborating with international organizations and non-governmental organizations. In addition, the government also focuses on restoring the local economy through micro, small, and medium enterprises (MSMEs) as well as community empowerment and restoring coastal ecosystems. On the other hand, fishermen still choose to focus on fishing efforts as a strategy to increase their income after the disaster.

Keywords: Strategy, Fishermen, Economic Recovery, Post-Earthquake and Tsunami

ABSTRAK

Kondisi produksi perikanan di Kabupaten Donggala mengalami penurunan yang signifikan akibat bencana gempa dan tsunami pada tahun 2018. Pasca bencana, pemerintah melakukan berbagai upaya rehabilitasi untuk pemulihan perekonomian lokal. Tujuan Penelitian ini untuk mengetahui strategi pemerintah dan nelayan dalam meningkatkan pendapatan pasca bencana gempa dan tsunami. Metode yang digunakan berupa analisis data deskriptif kualitatif. Hasil penelitian ini menunjukkan bahwa sebelum terjadi gempa dan tsunami, masyarakat nelayan pesisir bergantung sepenuhnya pada aktivitas penangkapan ikan di laut untuk memenuhi kebutuhan hidup mereka. Rata-rata pendapatan responden nelayan yang terdampak gempa dan tsunami mencapai Rp10.383.775. Angka ini diperoleh dari rata-rata penerimaan sebesar Rp168.404.125 setelah dikurangi dengan rata-rata total biaya yang tercatat sebesar Rp158.020.350. Strategi pemerintah untuk meningkatkan pendapatan nelayan pasca gempa dan tsunami meliputi penyediaan bantuan kepada nelayan, pemberdayaan dan pelatihan nelayan, pengembangan budidaya perikanan, perbaikan infrastruktur, peningkatan akses pasar, serta kolaborasi dengan oeganisasi internasional dan lembaga swadaya masyarakat. Selain itu, pemerintah juga berfokus pada pemulihan perekonomian lokal melalui usaha mikro, kecil dan menengah (UMKM) serta pemberdayaan masyarakat dan pemulihan ekosistem pesisir. Disisi lain, para nelayan masih memilih untuk tetap berfokus pada usaha pengkapan ikan sebagai strategi untuk meningkatkan pendapatan mereka pasca bencana.

Kata Kunci: Strategi, Nelayan, Pemulihan Ekonomi, Pasca Gempa Bumi dan Tsunami

INTRODUCTION

Indonesia is known as one of the areas with the highest levels of seismic activity in Asia. This can be seen from the many islands spread throughout Indonesia, as well as the various topographic forms that adorn it. Indonesia's geographical location on the meeting point of three major tectonic plates, namely the Indo-Australian, Pacific, and Eurasian plates, makes it one of the countries with a high risk of earthquakes (Januarti & Ramadoni, 2022; Utomo & Purba, 2019). According to Lede & Tidore, (2024), earthquakes occur due to tectonic activity that suddenly releases energy from within the earth's crust, which produces vibrations on the ground surface.

Coastal areas in Indonesia, especially in Central Sulawesi, such as the Donggala coastal area and Palu City Bay, are areas that are very vulnerable to earthquakes and tsunamis, which of course have a significant impact on coastal communities, especially fishermen. Utomo & Purba, (2019) explained that a tsunami is a water wave caused by vertical changes in sea level, which can occur due to underwater earthquakes, volcanic eruptions, underwater landslides, or even meteor strikes. These tsunami waves can spread anywhere, and this condition has an impact on people's ability to meet their daily needs.

The earthquake that occurred in Central Sulawesi in 2018 recorded a strength of 7.4 SR, accompanied by a tsunami that hit the west coast of Sulawesi Island, resulting in 1,946 fatalities on September 28, 2018, at 18.02 WITA (Hardjito, 2018). The National Disaster Management Agency (BNPB) reported that the total number of victims due to the earthquake in Donggala and the tsunami in Palu reached 2,045 people on October 10, 2018, due to the disaster that occurred on Friday, September 28, 2018 (Ihsanuddin *et al*., 2018). Sutopo Purwo Nugroho, spokesperson for BNPB, said that the height of the tsunami waves monitored reached 11.3 meters, while the lowest was around 2.2 meters.

Through the concept of sustainable livelihoods, we can get an idea of the activities needed by each community to run their lives. By using the capacity or ability they have and ownership of

resources to achieve the expected level of life. Related to the natural disaster of the earthquake, how can they recover and survive during times of crisis, and what actions they take to immediately recover from the situation after the earthquake. The difference in conditions that occur is different from the previous situation. In the context of poor families, the strategy for handling this problem is basically the ability of all family members to manage and organize the various assets they have and needs to be done, namely mentoring business recovery for economic sector actors affected by the disaster, counseling and training for creative economic businesses and MSMEs, providing business capital, counseling and empowerment of economic training for women entrepreneurs.

The contribution of fishermen's wives is very important in supporting the household needs of fishermen, where every income earned can improve family welfare (Dhengi & Wewe, 2023; Taufiq *et al*., 2022). One of the initiatives taken by fishermen's wives is to run a side business to increase their family's income (Amiruddin *et al*., 2024). Revenue is generally defined as the result of a company. In the applicable exchange price units, it can usually be measured and income can be recognized after the sales process has been completed (Lamia, 2013).

The source of economic income for fishing communities depends largely on the management of potential fishery resources (Mulyadi, 2009). Income that depends on the condition of these fishery resources makes fishermen face income uncertainty. Sources of income that depend on uncertain fish catches every season will directly and indirectly affect the limitations of education, skills, and technology owned (Sarjulis, 2011). The importance of the government's role in reviving the community's economy after the earthquake and tsunami, therefore the aim of this study is to determine the strategies of the government and fishermen in increasing income after the earthquake and tsunami disaster that occurred in Donggala Regency, Central Sulawesi Province.

METHODS

Time and Location of Research

This research was conducted in Donggala Regency and lasted for nine months, starting from April 2024 to December 2024. The focus of this research was on eight sub-districts affected by the earthquake and tsunami, and the respondents were fishermen using handline fishing rods who were affected by the earthquake and tsunami in 2018. Their characteristics include age, education, length of business, and number of dependents in the family.

Sampling

In this study, the population and sample will be determined based on the varying data needs for each analysis method. The sampling method used is purposive sampling, which is a technique that selects samples based on subjective considerations and the objectives of the study. Thus, it is expected to obtain unique and valuable information (Etikan, 2016). Purposive sampling is a sample selection method that follows certain criteria or specific selection (Siyoto & Sodik, 2015). This sampling will be carried out with the following criteria: Fishermen directly affected by the earthquake and tsunami, over 17 years old, fishermen have other businesses besides fishing.

Data Analysis

In this study, data analysis was carried out using qualitative descriptive analysis techniques. This technique functions to describe or explain factual conditions found in the field (Narulita *et al.*, 2023). Sugiyono, (2012) stated that qualitative research is a type of research in which the individual conducting the research acts as the main instrument. The data collection method is carried out through triangulation, while data analysis can be carried out using an inductive or qualitative approach:

1. To calculate the total catch using mathematical calculations, namely: the number of catches per trip.
   Description: 1 trip = number of arrests during 15 days.

2. To calculate income use the following formula:

$$\pi = TR - TC$$

   Information:
   π : Profit
   TR : Total reveneu
   TC : Total cost

3. To find out the receipts, use the following formula:

$$TR = P.Q$$

   Information:
   TR : Total Receipts (Rp)
   P : Selling price (Rp)
   Q : Number of Fish Sold (kg)
   Q : Number of Products Sold (gram)

4. To find out the total amount of costs incurred by fishermen, as follows:

$$TC = FC + VC$$

   Information:
   TC : Total cost
   FC : Fixed cost
   VC : Variabel cost

RESULT

The results of the data analysis can be seen that before the earthquake and tsunami disaster, there were 8 respondents from 8 coastal sub-districts who ran a fishing business at sea for one year. They carried out fishing operations for 10 months or 20 trips, with an average investment capital from the government of Rp44,520,094. This capital includes a pamboat boat measuring 6.50 m long, 1.00 m wide, 0.40 m high, equipped with a 5 PK ketinting engine, fishing gear (*Hand Line*), and a means of storing the catch in the form of a medium-sized cool box. The average depreciation cost per year reaches Rp11,130,023.50 while the annual operational cost is estimated at Rp60,000,000. This operational cost includes expenses for diesel fuel, block or crystal ice, and basic necessities or food supplies during the fishing process. During that period, the average catch reached 1,261.85 kg with an average selling price of Rp63,500/kg. From these results, fishermen can obtain an average annual gross income of Rp80,163,850,-. seen in the following table 1

Table 1. Average Income of Fishermen in Fishing Business Before the Earthquake and Tsunami in 2018

No	Respondents	Investment Costs (Rp)	Depreciation Expense (25%)	Operational Costs (Rp/year)	Catch (Kg)	Selling price (Rp/Kg)	Income (Rp/year)
1	Anwar	44.520.094	11.130.023,50	46.000.000	1.251,20	55.000	68.816.000
2	Ambodai	44.520.094	11.130.023,50	66.000.000	1.283,20	68.000	87.257.600
3	Parhang	44.520.094	11.130.023,50	62.000.000	1.258,00	65.000	81.770.000
4	Sudirman	44.520.094	11.130.023,50	60.000.000	1.254,80	63.000	79.052.400
5	Sudirman B	44.520.094	11.130.023,50	66.000.000	1.283,20	68.000	87.257.600
6	Abd. Waris	44.520.094	11.130.023,50	60.000.000	1.254,80	63.000	79.052.400
7	Abd Hafil	44.520.094	11.130.023,50	60.000.000	1.254,80	63.000	79.052.400
8	Hakimudin	44.520.094	11.130.023,50	60.000.000	1.254,80	63.000	79.052.400
	Average	**44.520.094**	**11.130.023,50**	**60.000.000**	**1.261,85**	**63.500**	**80.163.850**

Source: Primary Data, 2024

Fisheries Production in Donggala Regency Before the 2018 Earthquake and Tsunami.

An overview of the amount of fisheries production in Donggala Regency before the earthquake and tsunami in 2018 can be seen in Figure 1.

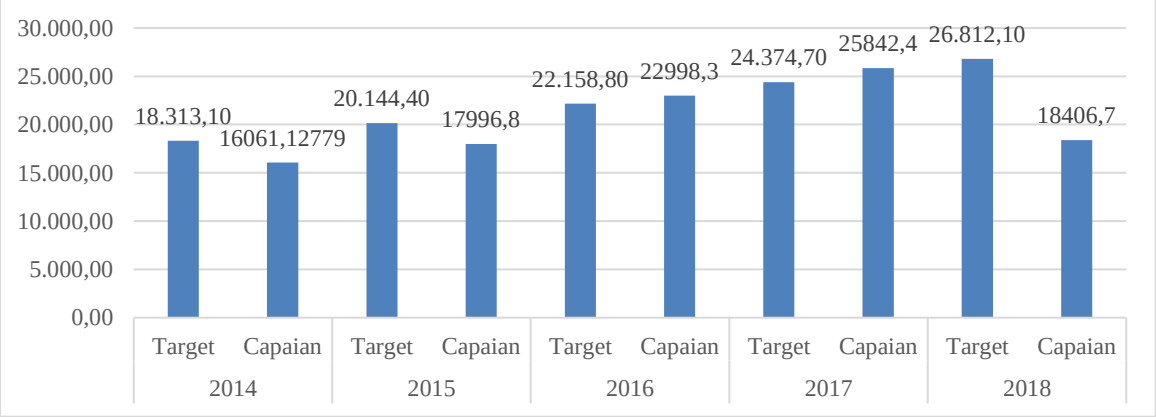

Figure 1. Fisheries Production in Donggala Regency 2014-2018.
Source: Processed Data from the Donggala Regency Fisheries Service, 2024.

Government Strategy in Efforts to Increase Fisheries Income and Production

1. Provision of assistance for fishermen

The Ministry of Maritime Affairs and Fisheries (KKP) provided fishing gear assistance to fishermen who lost their equipment due to the disaster.

a. Provision of assistance for fishermen

Fishermen who lost their equipment due to the disaster received assistance in the form of fishing gear, fishing boats, and boat engines from the government. One of the forms of assistance provided by the Ministry of Maritime Affairs and Fisheries (KKP) is assistance in the form of fishing boats and fishing gear. Many fishing boats were damaged

or sank due to the earthquake and tsunami. Therefore, the government provided assistance in the form of small motorboats, boats, and fishing gear such as nets and environmentally friendly fishing gear. This assistance aims to enable fishermen to return to sea and earn a living after the disaster.

b. Rehabilitation of production equipment

The technical assistance and support program provided by the Ministry of Marine Affairs and Fisheries (KKP) is used to repair damaged fishing gear. After the disaster, many fishing gear owned by fishermen in Donggala Regency were damaged or sunk due to the impact of the earthquake and tsunami. The Ministry of Marine Affairs and Fisheries (KKP) through the Central Sulawesi Provincial Marine Affairs and Fisheries Service and the Donggala Regency Fisheries Service provided assistance in the form of new fishing gear, including nets, fishing rods, and environmentally friendly fishing gear for affected fishermen. This assistance is to replace lost or damaged fishing gear so that fishermen can return to sea.

2. Fishermen Empowerment and Training

a. Fishery Product Diversification Training

As part of the efforts to restore the fisheries sector, the Donggala Regency Marine and Fisheries Service together with the Ministry of Marine Affairs and Fisheries (KKP) held training on processing marine products and fishery products. Diversification of fishery products aims to increase the added value and economic sustainability of fishermen and minimize dependence on fish catches alone. This training includes ways to process fish into processed products, such as smoked fish, dried fish, fish floss, and other processed products that can increase the added value of fishery products.

Assistance in the form of fish processing machines provided by KKP through the Donggala Regency Fisheries Service, such as smoking machines and fish grinding machines, to support the diversification of fishery products among fishermen and fish processing entrepreneurs.

b. Fishing Technique Training

Fishermen are trained to use modern technology to increase catches. Training on the use of environmentally friendly fishing gear is carried out by the Ministry of Marine Affairs and Fisheries and the Donggala Regency Fisheries Service to teach fishermen how to use fishing gear that is in accordance with the principles of sustainability. This training also involves the use of more efficient technology and techniques in fishing.

The Donggala Regency Fisheries Service (Diskan) also holds technical training on fishing business motorization to improve the skills of fishermen. The purpose of this training is to improve the understanding, knowledge, and skills of fishermen about technical methods related to boat engines.

c. Empowerment of Fishermen's Wives

Empowerment of fishermen's wives is carried out in order to improve the economy of the community, especially fishermen's families after the earthquake and tsunami.

Mardjudo *et al.*, (2022) argue that as an effort to build and develop home industry groups based on entrepreneurship, and increase external encouragement or motivation, it is necessary to increase the openness of community knowledge and gain access to various information that is useful for them.

Fishermen's Strategy to Increase Income After Earthquake and Tsunami

1. Fishing Business With Fishing Rod

a. **Total Cost**

1) Fixed Cost

Fixed costs refer to costs that remain constant in total despite fluctuations in business activity, whether increasing or decreasing. For fishing fishermen operating on the coast of Donggala Regency, details of fixed costs can be found in table 2 entitled "Investment Costs of Government Assisted Fishermen."

Table 2. Investment Costs of Government Assisted Fishermen.

No	Respondents	Boat	Katinting Machine	Fishing Tools	Fish Thermos	Investment Costs	Depreciation Expense
			9 PK	Pancing (set)	Cool box (bh)	(Rp/tahun)	25%
1	Anwar	35.000.400	12.700.000	10.000.000	5.000.000	62.700.400	15.675.100,00
2	Ambodai	35.000.400	12.700.000	10.000.000	5.000.000	62.700.400	15.675.100,00
3	Parhang	35.000.400	12.700.000	10.000.000	5.000.000	62.700.400	15.675.100,00
4	Sudirman	35.000.400	12.700.000	10.000.000	5.000.000	62.700.400	15.675.100,00
5	Sudirman B	35.000.400	12.700.000	10.000.000	5.000.000	62.700.400	15.675.100,00
6	Abd. Waris	35.000.400	12.700.000	10.000.000	5.000.000	62.700.400	15.675.100,00
7	Abd Hafil	35.000.400	12.700.000	10.000.000	5.000.000	62.700.400	15.675.100,00
8	Hakimudin	35.000.400	12.700.000	10.000.000	5.000.000	62.700.400	15.675.100,00
Rata-rata		**35.000.400**	**12.700.000**	**10.000.000**	**5.000.000**	**62.700.400**	**15.675.100,00**

Source: Primary Data, 2024

2) Variabel Cost

Variable costs, or known as variable costs, are costs incurred for a business activity but are uncertain in nature. According to (Mulyadi, 2009), variable costs or variable costs are costs whose amount changes in proportion to changes in the volume of activity. Variable costs associated with fishing (*Hand Line*) can be seen in table 3 provided.

Table 3. Variable Costs of Fishing Business.

No.	Respondents	BBM (L)	Block/Crystal Ice (sack))	Consumption	Operating costs (Rp)
1	Anwar	52,575,000	42,000,000	45,000,000	139,575,000
2	Ambodai	58,315,000	42,000,000	45,000,000	145,315,000
3	Parhang	56,313,000	42,000,000	45,000,000	143,313,000
4	Sudirman	58,315,000	42,000,000	45,000,000	145,315,000
5	Sudirman. B	54,311,000	42,000,000	45,000,000	141,311,000

6	Abd. Waris	54,311,000	42,000,000	45,000,000	141,311,000
7	Abd Hafil	54,311,000	42,000,000	45,000,000	141,311,000
8	Hakimudin	54,311,000	42,000,000	45,000,000	141,311,000
	Average	**55,345,250**	**42,000,000**	**45,000,000**	**142,345,250**

Source: Primary Data, 2024

3) Total Cost

Total cost is the accumulation of all expenses incurred during the operating process. Details of total costs for fishing fishermen can be seen in Table 4.

Table 4. Total Costs for Fishing Fishermen.

No	Respondents	Fixed Costs (Depreciation 25%)	Variable Cost (Rp/year))	Total Cost (Rp/year))
1	Anwar	15,675,100	139,575,000	155,250,100
2	Ambodai	15,675,100	145,315,000	160,990,100
3	Parhang	15,675,100	143,313,000	158,988,100
4	Sudirman	15,675,100	145,315,000	160,990,100
5	Sudirman B	15,675,100	141,311,000	156,986,100
6	Abd. Waris	15,675,100	141,311,000	156,986,100
7	Abd Hafil	15,675,100	141,311,000	156,986,100
8	Hakimudin	15,675,100	141,311,000	156,986,100
	Average	**15,675,100**	**142,345,250**	**158,020,350**

Source: Primary Data, 2024

Table 4 above concludes that the average total cost reaches Rp158,020,350,-. This amount consists of an average fixed cost of Rp15,675,100,- and an average variable or non-fixed cost of Rp142,345,250,-.

b. Fee Receipt

Revenue is a crucial aspect in every business, namely the total money received from the sale of a product measured in currency (Rupiah) (Mardani *et al*., 2017). In this study, fishermen sold their catch, which generated revenue from the sale. The value of fishermen's revenue in the coastal area of Donggala Regency is greatly influenced by the total weight of their catch. In addition, the fishing season factor also plays an important role in determining the value of revenue. The revenue obtained by fishermen is directly correlated with the volume of production they produce and the selling price of fish which varies in each location. If the catch production decreases, then the fishermen's revenue will also decrease. This revenue comes from the catch through the fishing method using fishing gear (*Hand Line*) which is sold at market prices. The following is the average revenue of fishermen in the coastal area of Donggala Regency in table 5 below.

Table 5. Revenue from Fishing Businesses After the Tsunami Earthquake.

No	Respondents	Catch (Kg/year)	Selling price (Rp/Kg)	Income (Rp/tahun)
1	Anwar	1.769,00	65.000	114.985.000
2	Ambodai	3.010,00	75.000	225.750.000

3	Parhang	2.510,00	74.000	185.740.000
4	Sudirman	2.516,00	72.000	181.152.000
5	Sudirman. B	3.010,00	75.000	225.750.000
6	Abd. Waris	1.916,00	72.000	137.952.000
7	Abd Hafil	1.916,00	72.000	137.952.000
8	Hakimudin	1.916,00	72.000	137.952.000
	Average	2.320,38	72.125	168.404.125

Source: Primary Data, 2024

c. Fishermen's Income

The income obtained should be sufficient to cover costs and return capital. Based on the previous table, it can be concluded that the average income of fishermen respondents affected by the earthquake and tsunami reached IDR 10,383,775. This figure was obtained from the average income of IDR 168,404,125 after being reduced by the average total cost recorded of IDR 158,020,350. The results of fishermen's income in the coastal areas of Donggala Regency can be seen in the following table 6.

Table 6. Average Total Income of Fishing Fishermen.

No	Respondents	Reception (Rp/tahun)	Total cost (Rp/tahun)	Income (Rp/tahun)
1	Anwar	168.404.125	158.020.350	10.383.775
2	Ambodai	168.404.125	158.020.350	10.383.775
3	Parhang	168.404.125	158.020.350	10.383.775
4	Sudirman	168.404.125	158.020.350	10.383.775
5	Sudirman. B	168.404.125	158.020.350	10.383.775
6	Abd. Waris	168.404.125	158.020.350	10.383.775
7	Abd Hafil	168.404.125	158.020.350	10.383.775
8	Hakimudin	168.404.125	158.020.350	10.383.775
	Average	**168.404.125**	**158.020.350**	**10.383.775**

Source: Primary Data, 2024

DISCUSSION

The role of the government in efforts to increase income and fisheries production after the earthquake and tsunami also played a role in the economic recovery process. The Ministry of Marine Affairs and Fisheries (KKP) provided fishing gear assistance to fishermen who lost their equipment due to the disaster, assistance in the form of fishing vessels and fishing gear in the form of small motorboats, boats, and fishing gear such as nets and environmentally friendly fishing gear. This assistance aims to enable fishermen to return to sea and earn a living after the disaster.

In addition, rehabilitation of fisheries production equipment was also carried out as one form of effort to increase income and fisheries production. Rehabilitation and repair of ships was carried out to help fishermen whose ships were damaged. KKP provided assistance with ship engines and navigation equipment so that fishermen could go to sea safely and efficiently. This assistance reduced losses and accelerated the recovery of the fisheries business. Cash assistance or working capital subsidies were provided by KKP to fishermen to purchase materials for repairing

fishing gear, including repairing damaged nets and replacing ship components lost due to the disaster.

In addition to providing assistance, empowerment and training of fishermen were also carried out by the government to improve the skills of the fishing community. Training in fishery product diversification aims to increase the added value and sustainability of the fishermen's economy and minimize dependence on fish catches alone. This training includes how to process fish into processed products, such as smoked fish, dried fish, fish floss, and other processed products, then training on the use of environmentally friendly fishing gear is carried out by the Ministry of Marine Affairs and Fisheries and the Donggala Regency Fisheries Service to teach fishermen how to use fishing gear that is in accordance with the principles of sustainability. This training also involves the use of more efficient technology and techniques in fishing and the empowerment of fishermen's wives is also carried out by the government in order to improve the economy of the community, especially fishermen's families after the earthquake and tsunami as an effort to build and develop home industry groups based on entrepreneurship. Fargomeli (2014) stated that fishing communities are part of Indonesian society that live by managing the potential of fishery resources. The strategy of fishermen in an effort to increase income after the earthquake and tsunami is through fishing efforts with fishing rods. Fishing activities are one way to utilize the existing fishery potential.

According to Fitriyana (2020), fishery potential is the main driver of economic growth in the fisheries sector. It is important to ensure that the fishing techniques used continue to prioritize the preservation of the aquatic environment and do not damage the habitat of aquatic organisms. Thus, we can maintain the sustainability of the ecosystem in these waters. The average income of respondents of fishermen affected by the earthquake and tsunami reached Rp10,383,775. This figure was obtained from an average income of Rp168,404,125 after being reduced by the average total cost recorded at Rp158.020.350

Financial value is one of the most important factors in a fishing business, because this factor will be directly related to the possibility of profit or loss in a fishing business. Fishing businesses basically have the risk of financial losses caused by low catch production factors and not in accordance with capital, or human resource factors that are not yet able to carry out fishing activities properly (Lindawati & Hendri, 2016). Production factors that can affect the catch need to be known so that efficiency and effectiveness can be carried out on input factors to produce optimal output, production factors include natural factors, labor factors, capital factors, entrepreneurial factors. Thus, in the end it is expected to increase the production of the catch obtained so that the welfare of fishermen also increases (Adisasmita, 2005).

CONCLUSION

The strategy implemented by the government to increase the income of fishermen after the earthquake and tsunami is by providing assistance and empowerment and training for fishermen, this greatly helps fishermen in running their businesses again after the earthquake and tsunami.

The strategy of fishermen in increasing the income of fishermen after the earthquake and tsunami, in addition to continuing to carry out fishing efforts at sea using fishing gear, the average income of fishermen affected by the earthquake and tsunami reached IDR 10,383,775/year.

Increased income means that production also increases, from the results of the evaluation of fisheries production after the earthquake and tsunami from 2019-2024 as a whole has exceeded the annual target of the Donggala Regency Fisheries Service, this is due to various rehabilitation and recovery programs after the earthquake and tsunami as well as active participation from the

fishing community in efforts to improve their economy so that there is an increase in fisheries production.

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