Productivity and Financial Analysis of Fishing Effort with Handline at Kutaraja Ocean Fishing Port Aceh Province

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ABSTRACT

Production of catches on hand line-fishing gear at Kutaraja Ocean Fishing Port has decreased, this is clearly seen from the level of fish production produced, which was 2.407.580 tons in 2018 compared to production in 2019, which was 2,285,750 tons. The fishing business, which has become one of the livelihoods of the Indonesian people, is a little riskier compared to other businesses because the fish which are the main target of this business is always moving dynamically. The research objectives were to determine productivity per GT, Trip, and ABK on hand line-fishing gear and to determine the financial feasibility analysis of fishing effort on hand line-fishing gear at Kutaraja Ocean Fishing Port. The benefits of this research are to increase knowledge and insight regarding productivity and financial analysis of the fishing line effort. The method used in this study is a survey method. The data analysis method used in this research is a descriptive analysis method. The results showed that the value of productivity per trip with large-size ships has a high amount of production compared to smaller ship sizes. This is because a larger ship has a carrying capacity or more carrying capacity. Hand line fishing with a vessel size > 30 GT has a relatively long payback period, i.e. < 5 years. While ships with a size of 5 GT. 6 GTs. 9 GTs. 22 GTs. and 24 GT have a payback period of < 3 years. This is because a larger ship has a carrying capacity or more carrying capacity. Hand line fishing with a vessel size > 30 GT has a relatively long payback period, i.e. < 5 years. While ships with a size of 5 GT. 6 GTs. 9 GTs. 22 GTs. and 24 GT have a payback period of < 3 years. This is because a larger ship has a carrying capacity or more carrying capacity. Hand line fishing with a vessel size > 30 GT has a relatively long payback period, i.e. < 5 years. While ships with a size of 5 GT. 6 GTs. 9 GTs. 22 GTs. and 24 GT have a payback period of < 3 years.

Keywords: Production, Hand Line, Kutaraja Ocean Fishing Port, Payback Period

1. INTRODUCTION

One of the fishing ports that have a sizeable production of caught fish in Aceh is the Ocean Fisheries Port (PPS) Kutaraja, which is included in the WPP 572 fisheries management area with a status that is already over-exploited for pelagic fish and fully exploited for demersal fish. PPS Kutaraja, which is located in the city of Banda Aceh, has a very strategic location, which is directly opposite the Malacca Strait and the Indian Ocean (Kurnia, 2019). Fajri *et al*. (2018) also stated that PPS Kutaraja is located close to a potential fishing area (DPI) and is directly facing international shipping lanes. Seeing the potential of PPS Kutaraja, the central government assisted by the UPTD PP Kutaraja, the Central Government and the Government of Aceh took concrete steps, namely in 2014 the old Kutaraja Fishing Port (PPP Lampulo) to PPS the existing Kutaraja (KKP, 2014). This port relocation resulted in an increase in port status, namely from a class C fishing port to class A in 2016.

Catch production in hand line fishing gear at PPS Kutaraja has decreased, this is clearly seen from the level of fish production produced, which was 2,407,580 tons in 2018, compared to production in 2019, which was 2,285,750 tons. According to Inizianti (2010), the operation of a hand line is to hook the bait on the hook that has been given a line and sink it into the water. When the fish eat the bait, then the eyes of the fishing line are caught in the fish mouth and the fishing line is pulled into the boat. The vessels commonly used in the operation of hand line fishing gear are traditional wooden boats or boats, or outboard

motor boats. According to Rahmat & Thamrin (2016), yellowfin tuna (*Thunnus albacares*) and skipjack tuna (*Katsuwonus pelamis*) dominate Hand line catches, because they are the target fish. As for some other types of fish caught, such as mackerel (*Scomberomorus commerson*), little tuna (*Auxis thazard*), Arius (*Arius thalassimus*), and sharks (*Carcharhinus spp*). The number of fishing gear in Kutaraja PPS has also increased from 2019 which only had 371 units where the number of fishing gear was 71 units, increasing to 531 units, and fishing rods were 237 units in 2020. Fishing is an activity angler to support/fulfill the economy that utilizes biological resources waters with the aim of making a profit. Fishing business activities are related to business principles in general, everything that is needed is carefully considered between the costs incurred and the costs incurred.

Financial analysis needs to be carried out with the intention of knowing the development of the fishing business from time to time (Jendris *et al.,* 2016). The fishing business is a business that is strongly influenced by natural factors such as weather and season. This causes the fishing business to have a business pattern that is periodic between productive time (fishing season) and lean times (not fishing season). Satrio (2014) states that increasing productivity is a top priority for economic growth that must be implemented immediately in facing the challenges of economic development, because the level of productivity can describe the level of people's welfare. In addition to the large operational cost factor, productivity and fish availability vary from year to year in line with changes in marine environmental conditions.

2. RESEARCH METHODS
Time and Place

This research was carried out in October 2021 at the Kutaraja Ocean Fishing Port, Banda Aceh City, and Aceh Province.

Methods

The research method used in this research is a survey method by making direct observations in the field, obtaining primary data and secondary data and conducting interviews by preparing questionnaires to be asked of hand line fisheries business actors (*handline*)

Procedure
Data collection

The data collected in this study are data on production factors and handline fishing gear at Kutaraja PPS. These data include vessel size (GT), number of crew members, number of fishing trips, age of fishing gear, GPS, echosounder, and vessels used. The catch data is obtained from the catch logbook. While the data on the amount of fuel, the amount of ice, the amount of consumption, the amount of oil, the amount of water, and the amount of salary were obtained through interviews and observations. Based on the data obtained from PPS Kutaraja, there were 87 handline vessels, but only 10 units were used as research samples to represent the others with various ship GT sizes.

Processing and analysis of data

Data analysis in research descriptively. The value of productivity in this study can be determined by calculating the average catch of fishing rods for a year and fishing effort in the form of fishing trips, the size of the vessel used, and the number of fishing trips.

3. RESULT AND DISCUSSION
Handline Fishing Gear Productivity

Hand-line fishing productivity is the ability to produce hand-line fishing gear within the time of catching. The volume of catch and the size of the fishing area where the fishing gear is operated. The catch of the hand line is the value of the productivity of the hand line fishing fleet at the Kutaraja Ocean Fishing Port, Aceh Province. Capture fisheries productivity includes productivity per tonnage or GT, productivity per trip or CPUE, and productivity per crew. Handline fishing gear can also be calculated by productivity per GT. productivity per trip and productivity per crew. Productivity per gross tonnage can be seen in Figure 1.

Based on Figure 1. It can be seen that the highest productivity per gross tonnage is a 6 GT vessel with a productivity per gross tonnage of IDR 240.437.167, and for the value of productivity per gross tonnage the smallest is a 35 GT ship with a productivity per gross tonnage of IDR 57.632.114.

In Figure 1, it can also be seen the results of the correlation between the relationship between productivity per gross tonnage and ship size, which has an R2 value of 0.9559 and

r (correlation coefficient) is 0.9777. Then the correlation coefficient is 0.9777, which shows a very strong relationship between ship size and productivity per Gross Tonnage (Figure 1).
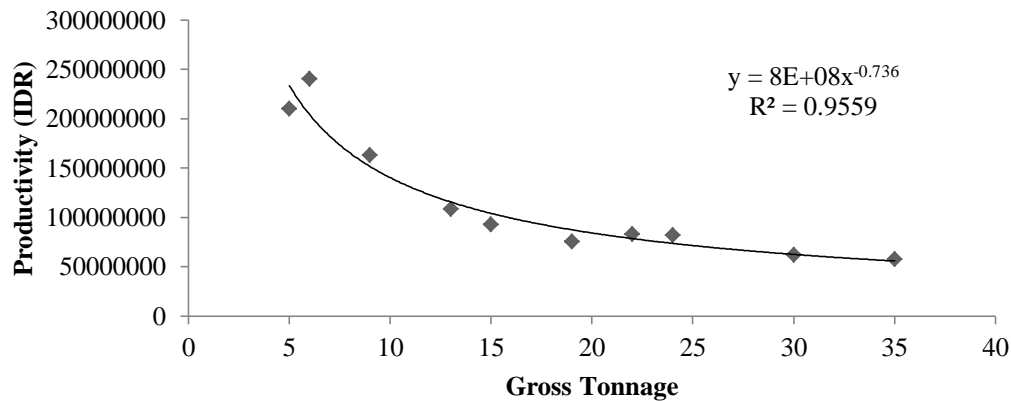

$$y = 8E+08x^{-0.736}$$
$$R^2 = 0.9559$$

Figure 1. Graph of productivity per gross tonnage

$$y = 1E+06x^2 - 5E+07x + 7E+08$$
$$R^2 = 0.7198$$
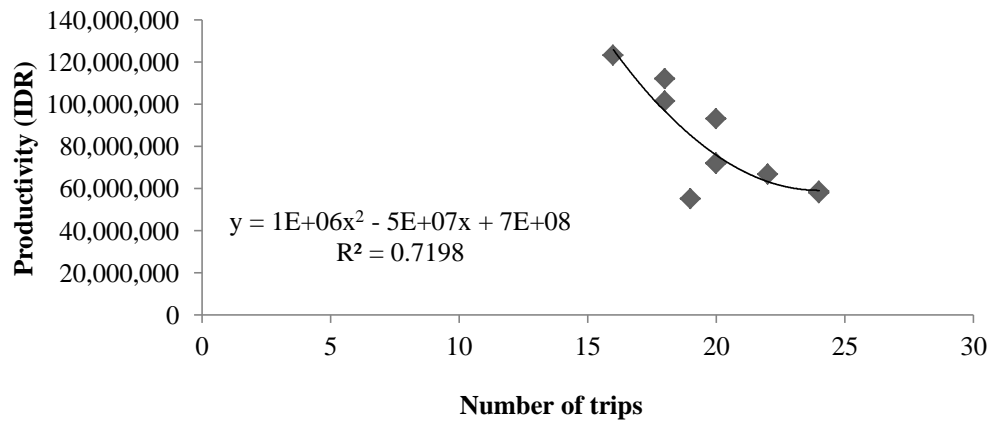
Figure 2. Productivity per number of trips

$$y = 1E+09x^{-0.691}$$
$$R^2 = 0.7093$$

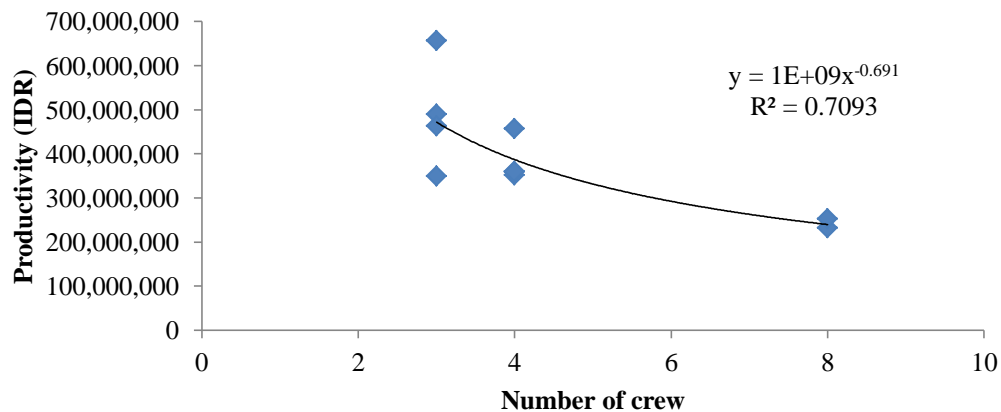**Figure 3. Productivity per crew**

Based on Figure 2, it can be seen that the highest production value per trip is a 24 GT ship with a productivity per trip of IDR 123.223.000 per trip. Moreover, the lowest productivity value is a 5 GT ship with a productivity of IDR 55.221.158 per trip. The result of the correlation between productivity per trip and ship size is the value of R^2 0.7198 and r (correlation coefficient) is 0.8484 which shows that there is a very strong relationship between ship size and productivity per trip. Productivity per crew member can be seen in Figure 3.

Figure 3 shows that the highest value of productivity per crew is a ship with a size of 24 GT with a productivity of IDR 657.189.333 per

crewmember. Moreover, the lowest production value per crewmember is a ship with a size of 30 GT, which is IDR 232.570.500 per crewmember. The results of the correlation between productivity per crewmember and ship size are R^2 0.7093 and r (correlation coefficient) namely 0.8421. The correlation coefficient is 0.8421 indicating a very strong relationship between ship size and productivity per crewmember.

The biggest productivity value is a 35 GT ship and the highest productivity value is a 5 GT ship. According to Kisworo *et al.* (2013), productivity values are grouped into three, namely productivity per tonnage (GT), crew productivity, and productivity per trip. The number of catches (production volume) and the total value of production for one year, the size of the ship or GT, the total crew for one year, and the number of trips influence this value for one year.

Feasibility of Fishing Gear Business (Handline)

Fishing business activities have the goal of making a profit. The fishing effort is said to be successful if the business actor gets the maximum possible profit. The payback value for handline fishing at the Kutaraja Ocean Fishing Port can be seen in Figure 4.
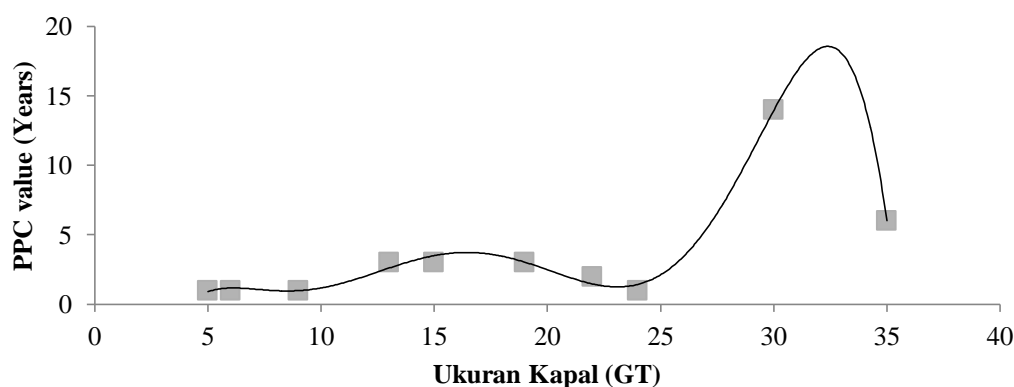

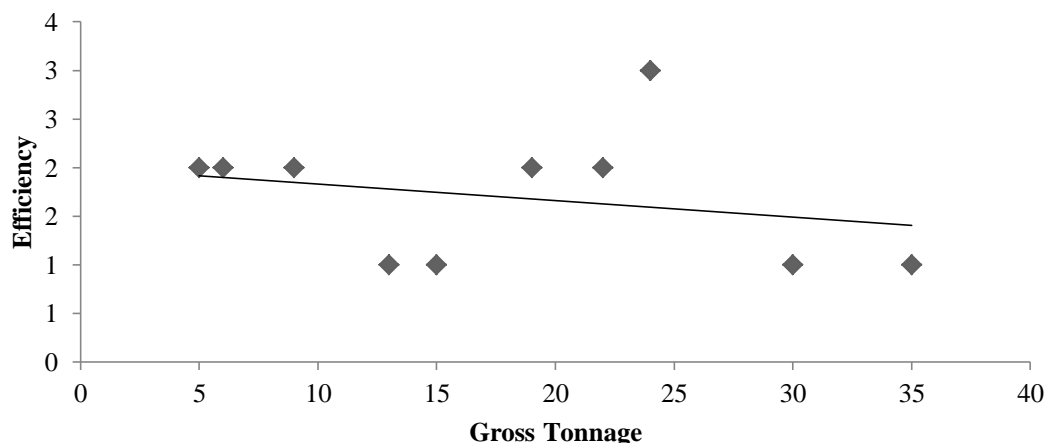**Figure 4. Payback Period Value for Handline Catching at PPS Kutaraja**

Figure 5. Graph of hand line fishing business efficiency at the Samudera Kutaraja fishing port in 2020

Based on Figure 4, it can be seen that the largest PPC value is a ship with a size of 24 GT. While the lowest PPC value is a ship with a size of 30 GT. Judging from the graph, there are ships with a size of 30 GT and 35 GT that have a PPC value of up to 14 which states that ships of this size have a relatively long return on capital, which is more than 5 years. However, for ships under 24 GT the PPC value does not reach 4. This indicates that ships under 24 GT have a payback period of less than 5 years. The average payback period (PPC) value of hand line fish at the Kutaraja Ocean Fishing Port is 3.5, meaning that the time needed to return investment costs is around 3-5 years.

Based on Figure 5, it can be seen that ships with a size of 24 GT have the highest efficiency value and ships with a size of 30 GT and above have the lowest efficiency value. The results of the calculation of the economic

efficiency value of handline fishing are 1 to 3 with an average efficiency of 1.7. With the efficiency values that have been seen, it can be said that fishing with hand-line fishing gear is indeed efficient and profitable. Can be seen from the average efficiency value greater than one.

In research conducted on handline fishing vessels, it can be said to be efficient, said to be efficient because the efficiency value of handline fishing vessels in Kutaraja PPS is ≥ 1. In the research of Jendris et al. (2016) in the study of Financial Analysis of capture fisheries business with the return on investment is said to be moderate because the Payback Period (PPC) is 0.3 but the value is less than 0.5/year. The efficiency criteria according to Pramudya (2001) are not feasible if < 1 and if > 1 then the business is feasible to continue.

4.   CONCLUSION

The average productivity of vessels per GT is IDR 117.449.653 per GT, the average productivity of ships per trip is Rp. 81,239,482 per trip and the average productivity of the ship per crew is IDR 397.341.625 per crew. Efficiency analysis of the research results shows that the average BCR is 1.7 where an efficiency value of more than one > 1 will be said to be profitable. So the handline fishing business at PPS Kutaraja can be categorized as profitable. From this study, it can also be seen that ships with a size of 30 GT and above are less efficient due to the large expenditure costs; on ships with a size of 30 GT and 35 GT where the efficiency value is lower. From this study, the average payback period is 3,492, which means the payback period for hand line fishing is less than five years < 5 years or the payback period for business is moderate.

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