



Feasibility of Ray Processing Business in Cilacap, Central Java

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ABSTRACT

Rays are one of the demersal fish that is widely found in Indonesia, particularly in Cilacap. The flesh of rays is widely consumed and the processed fish is only found in Menganti Village, Cilacap. In addition to being salted fish, rays are processed into meat fillets, skin crafts, bones, fins, and gills of rays. The research on rays processing aims to analyze the feasibility of a ray processing businesses in Cilacap, Central Java, where this research was conducted from March to April 2022. Primary data collection was obtained from the results of interviews with fishermen with 10 respondents and this study was conducted using the observation method and analyzed by business feasibility analysis. The results of the data analysis in this study show that the BEP (Break Event Point) of the stingray processing business is very feasible because the average R/C value is 11.6 where the ratio is >1.0 while the return on investment (PBP) period is for 4 months and the average profit is Rp.396,892,142.9.

Keywords: Cilacap, Fish products, Stingrays

INTRODUCTION

Rays are often found on the coast and can even be found in freshwater waters. Rays are demersal fish with a flat shape and the mouth part is located in the ventra or inferior part, which is flat (Widodo *et al.* 2016). Likewise, Wahyudewantoro & Dahrudin (2015) stated that Rays inhabit warm tropical and subtropical coastal waters and some of them can be found in freshwater waters. Rays are often found in shallow waters or even lying quietly in the sand. Rays in Cilacap that are sold in markets are usually fresh and dried. According to Manik (2003), apart from being used as food for humans and livestock, Rays meat can also be used as medicine, but its exploitation has not been carried out intensively because until now it has not been the main target fish in Indonesia's capture fisheries business. Apart from that, Rays are fish that can be cultivated in traditional and modern markets. This is in accordance with what was said by Sahubawa *et al.* (2021) which states that Rays have economic opportunities to be developed into food (consumable) and non-consumable products (commercial creative skin products). So far, Rays sold in fish markets are usually fresh or dried. Apart from that, Rays in Cilacap are often

processed into salted fish, and Rays are also used as export commodities such as meat fillets, skin crafts, bones, fins and gills of Rays fish. Rays skin per sheet is valued at up to 30,000 rupiah for 8-inch size (Efendi *et al.*, 2018).

This research aims to analyze the feasibility of the stingray processing business in Cilacap, Central Java. This research is important to see whether processed fish provides benefits and can diversify fishery products in Cilacap, Central Java and even become a superior product for the community. Harahap *et al.*, (2019) must be tested with business feasibility so that the business can make a profit and run long term. The profits obtained in a business can be a parameter for the success of a business. Apart from that, Kasmir & Jakfar (2016) also stated that business feasibility is used to analyze in depth whether the business that will be or is being run is feasible or not to continue to be operated. Umar (2020) stated that one way to develop a business is by making new investments, therefore it is necessary to carry out a feasibility study to estimate whether the investment to be made is feasible or not.

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METHODS

The research was conducted in Cilacap (Figure 1) from March to April 2022. The research was conducted in Menganti Village, which is a ray processing area. Primary data obtained from interviews with fishermen and ray processors. There were 10 respondents interviewed because only 10 people were ray processing entrepreneurs in Menganti Village. The sampling technique was carried out purposively (purposive sampling). Purposive sampling is a sampling technique in which sampling units are selected based on certain considerations with the aim of obtaining sampling units that have the characteristics or criteria desired in sampling. The research stages are:

1. Initial survey to introduce research locations conducted in January 2022;
2. Primary data collection consisting of collecting business feasibility analysis data, production data and fishing fleet data;
3. Secondary data collection;
4. Data analysis.

The data collected consists of primary data and secondary data. Primary data consists of investment cost data, fixed costs, variable costs, production data and data on the number of fishing fleets. Apart from that, production data and fishing fleet data were taken from 2017 to 2021. The research method in this research was observation, apart from that there were interviews with respondents. Interviews with respondents used a purposive sampling method where respondents

were selected randomly and were ray fish processors.

Data Analysis

Material

1. CPUE

Standardization of fishing gear is used to standardize fishing efforts, so that it is assumed that the fishing effort of a fishing gear can produce relatively the same catch as the standard fishing gear. Standard fishing gear is fishing gear that predominantly catches certain types of fish and has a Fishing Power Index (FPI) value equal to one. The FPI value is calculated using the following formula (Sparre & Venema 1999). The CPUE value is recalculated with the new fishing effort value, namely the fishing effort value after standardizing fishing effort. The value of the catch remains the same.

$$CPUES_i = \frac{Catch_i}{Effort_i} \quad i = 1, 2, \dots, n$$

Where:

CPUES_i = catch per standardized fishing effort in year i (ton/trip)

catch_i = catch in year i (ton)

effort_i = Standardized fishing gear fishing effort is added to standard fishing gear fishing effort in year i (trip)

2. Business feasibility analysis

Analysis for business feasibility uses the R/C ratio, PP and B/C ratio which looks at the description of the ray processing business.

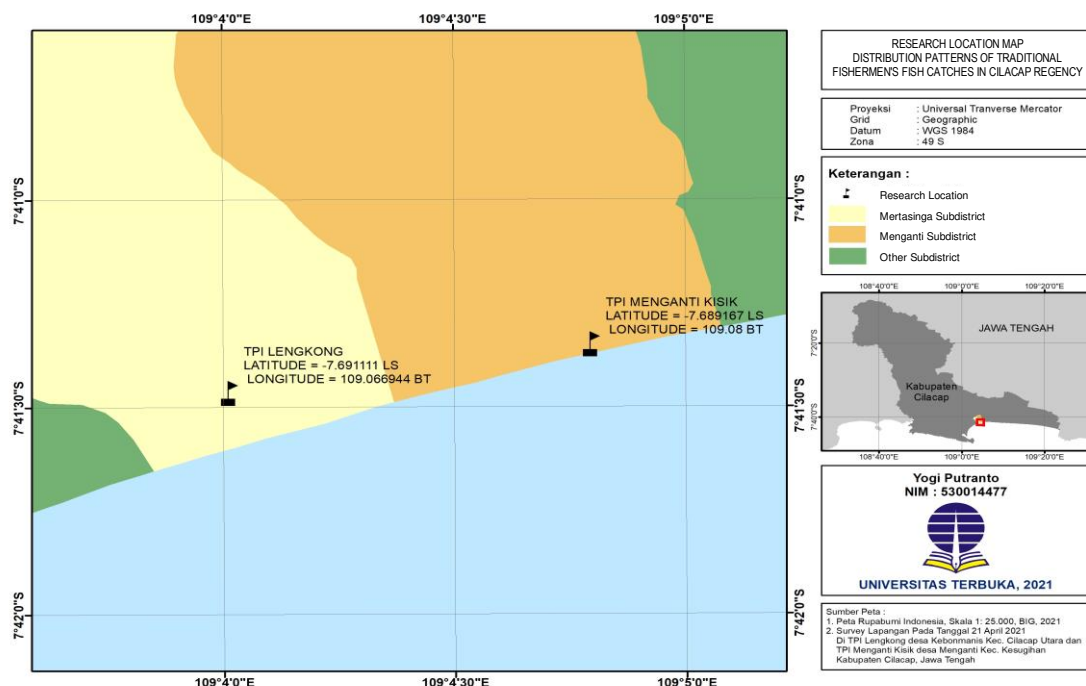


Figure 1. Point of research location.

1. PP (*Payback Period*)

Payback Period analysis can be found using a formula:

$$PP = \frac{Investment}{Benefits}$$

2. R/C Ratio

R/C Ratio is a value that shows the comparison between business revenues (Revenue = R) and Total Costs (Cost = C). Within the limits of the R/C value, it can be seen whether a business is profitable or unprofitable (Nugroho *et al.*, 2021).

$$R/C \text{ Ratio} = \frac{Total \text{ revenue}}{Total \text{ cost}}$$

3. B/C Ratio (*Benefit Cost Ratio*)

B/C Ratio analysis can be found using this formula:

$$Net \ B / C = \frac{\sum_{t=1}^n \frac{Bt - Ct}{(1 + i)^t}}{\sum_{t=1}^n \frac{Ct - Bt}{(1 + i)^t}}$$

Decisions are based on the following criteria:

- If Net B/C > 1, then the business worth running
- If Net B/C < 1, the business is not worth running

RESULTS AND DISCUSSION

Results

Rays are common to be found in Cilacap, but ray production is decreasing from year to year. This can be seen from the catch in 2017 of 63.01 tonnes and in 2021 of 4.96 tonnes (Figure 2). The decrease in production was due to the growth of rays which take a long time and the large number of ray fishing activities, there were even certain ships that specifically catch rays. Apart from that, the decline was due to consumer interest in rays was increasing, this can be seen from ray, not only processed fish but meat fillets, leather crafts. As market demand continued to increase for ray commodities, rays had become the main prey of fishermen and had quite important economic value.

Figure 2 shows that the number of fishing fleets in Cilacap was increasing from year to year. The increase in the number of fishing fleets from 2017 to 2021 was an average of 11.86%, this was due to easy fleet licensing in Cilacap making it easy for fishermen to add the fleet. An increase in the number of fleets will affect the stingray fish resources in these waters because the more fish caught, especially the small size, will affect the stingray fish stock. This is in accordance with Mahdiana *et al* (2022) who stated that the large number of immature or juvenile caught can damage resource sustainability, especially their slow reproductive ability.

The results of interviews with fishermen also stated that ray fishing has increased because fishermen can sell rays in the form of fresh fish and processed fish and processing rays does not require a lot of costs. This is in accordance with (Camhi *et al.*, 1998) which stated that the increasingly threatened conservation status of rays is thought to be due to excessive hunting and development which is quite difficult and takes a long time for these rays. Apart from that, according to Wijayanti *et al.*, 2018, Elasmobranchii is currently facing the problem of a high rate of extinction due to overfishing which is triggered by high market demand for ray meat and skin and shark fins.

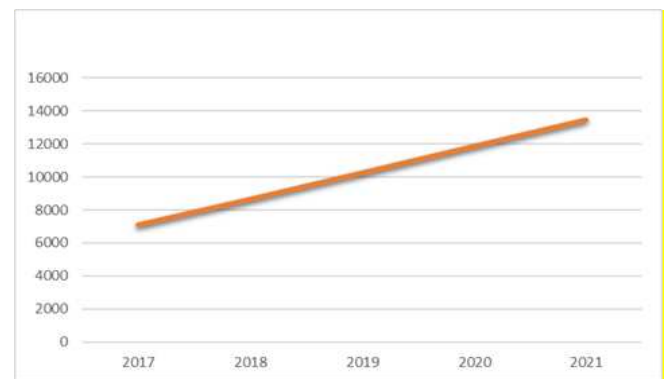


Figure 2. Trends in the ray fishing fleets

In Figure 3, the cumulative catch vs CPUE shows a linear equation $y = -0.00007x + 14.856$ with $R^2 = 0.5833$. The graph shows that the R-square value shows that cumulative catch has an effect on CPUE. Apart from that, the number of catches affects CPUE by a value or 14.8% and every additional 1 in the number of catches will affect the CPUE value by -0.00007.

Figure 4 shows the analysis of fishing effort vs CPUE, the linear equation $y = -0.0016x + 20.809$ is obtained with a value of $R^2 = 0.8144$. This shows that the R value is getting closer to 1, meaning that fishing effort affects CPUE. Every time there is an additional 1 arrest attempt, the CPUE will decrease by 0.00016.

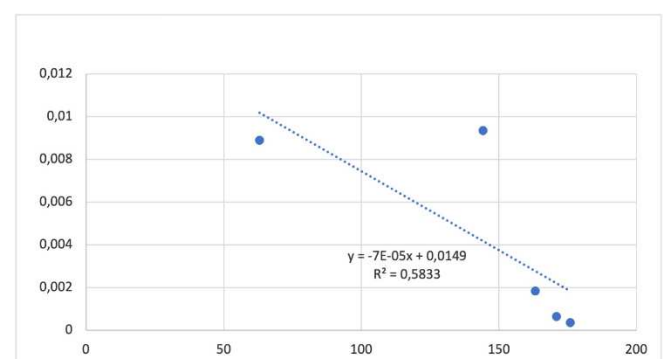


Figure 3. Cumulative Catch vs CPUE

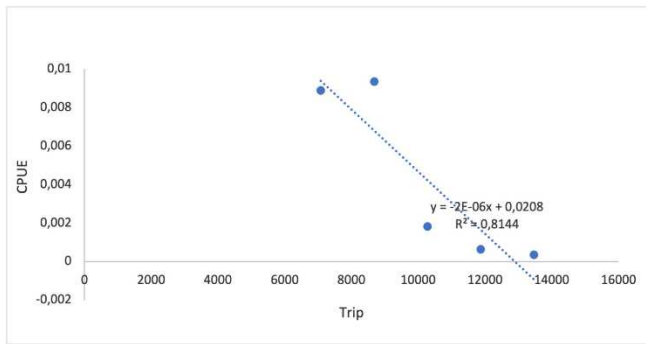


Figure 4. Trip vs CPUE

Discussion

Productivity from 2017 to 2021 decreased every year and the highest CPUE occurred in 2018 at 0.0093 while the lowest occurred in 2021 at 0.0003. The highest productivity was in 2018 because there were still Tuna longline fishing gear used by fishermen to catch sharks and rays so that the catch was high and productivity was the lowest in 2021 because Tuna longline fishing gear was replaced by handline where the handline catch was less than Tuna longline. Apart from that, the decrease in productivity was also caused by an increase in the fishing fleet so that more fish were caught which could reduce fish resources.

Analysis of the financial feasibility of creative ray skin product processing businesses is carried out by calculating investment costs, depreciation costs, total production costs, revenues, income and business feasibility criteria which include R/C Ratio, PP (Pay Back Period) BEP (Break Event Point). This ray processing business was very feasible because the R/C value was an average of 11.6 where the ratio is > 1.0. Apart from that, the analysis results show that the stingray processing business was profitable because the ratio value is greater than 1. This is in accordance with Pasaribu *et al*, 2017 which stated that the R/C Ratio value is 1.74 or greater than 1, which means the business is very profitable for run and the level of productivity of this business is very efficient.

Payback period is the rate of return on capital or the length of time used to cover the original investment costs. The faster the return on investment for a business, the better the business pattern because the smoother the capital turnover (Pujianto *et al*. 2012). The investment payback period (PP) was 4 months so it didn't take a long time. The PP value of this processing business had a rate of return on investment costs that was in the fast category because it was less than one year so the business was feasible to run. In accordance with Sahubawa and Supardjo (2020) and Hadiyati (2011) who stated that if the return period for

business investment is faster than the specified time, then the business is worth running in investment.

The average profit from the business feasibility analysis was Rp. 396,892,142.9, while the BEV unit was 214.22 and the BEV value was 2993,222.62, which shows that BEV is very feasible. Overall, the ray processing business in Menganti Village, Cirebon, was quite feasible and profitable to develop and worthy of long-term investment. This was stated by Halid *et al*. 2017 that a productive business unit is very likely to provide sustainable profit value from each production cycle.

CONCLUSION

Ray processing in Cilacap was a business worth developing because it had an R/C value of greater than one, a PBP of around four months and an average annual income of Rp. 396.892.14.

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