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FEASIBILITY ANALYSIS OF INVESTMENT FACILITIES OF SLIP FISH PROCESSING FACTORY, SORONG DISTRICT

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Abstract. The potential of marine resources in Sorong Regency, West Papua is very abundant, especially in the fisheries sector. The abundant potential of tuna makes it an attractive commodity. Fishery products are foodstuffs that are susceptible to post-catching spoilage so that they can last a long time, a canning process is needed. This study aims to analyze income, costs and investment decisions at a fish canning factory in Sorong Regency to obtain the feasibility of a project with quantitative research methods, because this study seeks to determine the value of the feasibility indicators of an investment project. The result of the investment criteria is an NPV of Rp. 7,841,604,054.00 is greater than zero, the IRR value is 97.84% greater than the 14% interest rate and the Net B/C value is 2.44 greater than one. The payback period is achieved within 2 years 7 months 6 days, meaning this business can cover the initial investment costs before the end of the business life. The sensitivity analysis carried out shows that the canned fish canning factory is feasible to run as long as the project runs according to the assumptions and technical parameters specified.

Keywords: fish canning; Investment Eligibility; NPV; IRR; PBP.

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INTRODUCTION

In general, the grouping of fishery and marine resources is divided into groups of pelagic fish whose habitat is around the surface such as skipjack, tuna, anchovies, mackerel, selar, layur and mackerel, groups of demersal fish such as snapper, yellow tail, baronang fish, samandar fish. , bubara, shrimp group which is a mainstay commodity from Sorong Regency which is mostly caught by traditional fishermen with a partnership system with collector entrepreneurs. Geoeconomically, Sorong Regency is one of the areas in West Papua Province that has very potential marine resources from a variety of species ranging from marine animals, marine plants to complete ecosystems. The potential of renewable marine resources in Sorong. In addition, there is still potential for renewable energy from the sea, namely deep sea water which is still a challenge to be developed and utilized in the future. The maritime industry, biotechnology, marine services, production of salt and its derivatives, marine biopharmacology, utilization of sea water other than energy, installation of underwater pipes and cables, and/or lifting of sunken objects and ship cargo are marine sub-sectors that have not been optimally exploited. By looking at the huge potential of marine resources in Sorong Regency, West Papua, the Sorong Regency Government should make policies that can make marine and fishery resources a new driver of the economy in the future so that they can be released from the poverty of the shackled population.

Sorong Regency is one of the regions of eastern Indonesia which has very potential marine resources from a variety of species ranging from marine animals, marine plants to complete ecosystems. The various potentials of marine natural resources are used by the community continuously to meet their daily consumptive needs and also for commercial purposes starting with the traditional way to the modern way.

Fish is one of the sources of food that is needed by humans because it contains protein, essential amino acids and has high biological value and the price is cheap compared to other animal protein sources (Tangke, Bafagih, & Daeng, 2018). According to (Damongilala, 2008), fish and other fishery products are foodstuffs that are easily subject to a post-morten process of high perishable food. Therefore, it is necessary to have good handling and reach the level of processing and diversification of fishery products. The principle of fish processing and product diversification basically aims to protect fish from spoilage or damage as well as increase shelf life and processing and diversification aims also to increase the shelf life of fish (Adawyah, 2007).

The design of a fish cannery requires an appropriate investment decision. There are a variety of different evaluation procedures that managers can use to analyze potential projects, namely net present value and internal rate of return (Shapiro, Astin, Bishop, & Cordova, 2005). In addition there are other calculations that must be analyzed such as Break event point and Pay Out Time to determine an investment decision (Gill et al., 2004).

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1. Net Present Value (NPV)

Net Present Value (NPV) can be defined as the present value of cash flows in the future, discounted with cost of capital the appropriate, then deducting the initial outlay of the project. Projects with positive NPV will be accepted, and projects with negative NPV will be rejected. This method performs calculations of cash flows and time value of money. The NPV formula is as follows (Shapiro, 2005; 14):

$$NPV = -I_0 + \sum_{t=n}^{n=1} \frac{CF_t}{(1+r)^t}$$

Where:

CF_t = cash flow per year in period t

r = Interest Rate (*Cost of Capital)*

I_0 = initial investment in year 0

t = period

n = number of periods

2. Internal Rate of Return (IRR)

IRR is the discount rate which is a set of present value of a the project is equal to the investment value. In other words, the IRR is the discount rate that results in the NPV being zero. The NPV and IRR methods are similar in that they have a decision to accept or reject. The IRR formula is as follows (Kelly et al., 2005).

$$IRR = -I_0 + \sum_{t=n}^{n=1} \frac{CF_t}{(1+IRR)^t}$$

Where:

CF_t = cash flow per year in period t

IRR = *Discount rate*

I_0 = initial investment in year 0

t = period

n = number of periods

3. Payback Period

Payback Period is a method used to calculate the length of the period required to return the money that has been invested from the cash flow netproceeds annualgenerated from the investment project. The PP formula is as follows:

$$PP = \frac{Net\ cash\ investment}{Annual\ net\ cash\ inflow}$$

Innovations in the field of fishery processing need to be carried out by taking into account the feasibility of an investment. Investment is a strategic way in the process of economic development based on fishery commodities. Investment activities also create opportunities for the availability of competitive assets and the implementation of competitiveness creation processes. Fishery commodities are export commodities if they can be processed properly, such as through the fish canning process. Being an export commodity causes a product to have a higher price than not being an export commodity.

A business feasibility study is a research that aims to decide whether a business idea is feasible or not (Suliyanto, Wulandari, & Novandari, 2010). Several methods can be used to determine the viability of a business. In the research of fish canning with pontoons, 4 methods are used in investment feasibility studies.

METHODS

This research will use quantitative research techniques, because this study looks for the value of the feasibility indicators of an investment project based on the calculation formulas to analyze the investment in the fish canning project in Sorong Regency, West Papua Province. Stages of Analysis In conducting data analysis with the following stages:

1. Performing an average cost calculation based on the costs incurred and production capability to obtain unit
2. Costs The average cost as unit cost will be added to the estimated income and take into account cost fluctuations in price escalation based on the formula in literature review which is compared with the owner's estimate to obtain the highest income, where the results of the calculation will be the unit price used as the basis for calculating income.
3. Conduct a feasibility analysis based on the formulation that has been determined in the literature review and previous research to obtain the NPV value, B/C Ratio , Profitability Index, IRR and Payback Periods and testing investment criteria using sensitivity analysis by considering investment parameters that may change during the investment period.

RESULTS AND DISCUSSION

Fisheries potential in Sorong Regency consists of capture fisheries and aquaculture potentials. The capture fisheries commodities include skipjack tuna, tuna, anchovies, mackerel, mackerel, snapper, yellow tail, samandar, shrimp, sea cucumbers and others. It is hoped that in the future development of aquaculture, both traditional, medium and industrial scale, this is possible considering that some water areas are suitable for the intended cultivation.

In general, fishery and marine resource groups are divided into groups of pelagic fish whose habitat is around the surface such as skipjack, tuna, anchovies, bloated, selar, layur and mackerel, groups of demersal fish such as snapper, yellow tail, baronang fish, samandar fish, bubara , group of shrimp which is the mainstay commodity of Sorong Regency

Table 1 . Potential of Pelagic Fish Production in the Natuna Sea

Types of Fish	Fishery Production by Fish Type (Tons)			
	2016	2017	2018	2019
Selar	Capture d469.51	1309.5	579.02	1191.79

Source: information public fishery service system in Sorong Regency, 2020

The value of fishery production in table 1 is expressed in live weight of fish when they are just caught. Commonly referred to as "round fresh", "round whole" or ex water weight equivalent of the quantities recorded at the time of

landing. Based on Table 1, the potential for the production of yellow trout in Sorong district for a period of 4 years, namely 2016-2019, it is stated that in 2017 the highest production of trout with a total catch of 1309.5 tonnes, while in 2018 it was stated that the number of trevally fish catches experienced a decline. decline. For raw materials, the average production amount is 887,455 tons.

Capital Source

The average source of capital used by the selar fish canning factory in Sorong Regency uses a source of capital that comes from own capital of 30% and some others start a business with a source of capital that comes from a banking institution loan of 70% with a commercial interest rate of scale credit. micro by 14.00% (Atikah, 2020).

Production Process.

The production process is a zone that functions as a place to produce canned yellow tilapia. The production flow carried out in this zone is receiving raw materials, cutting, washing, steaming, filling in cans, weighing, filling media, closing cans, sterilizing processes, and packing.

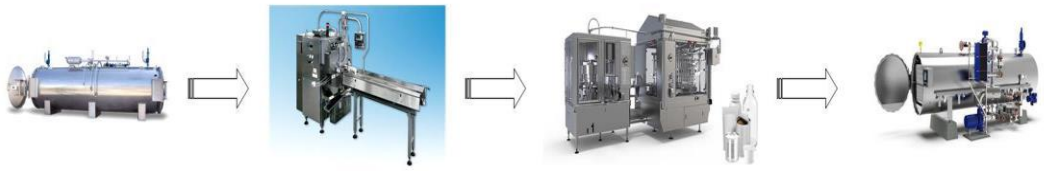

Figure 1. Fish Canning Flow

The related description of the yellow selar fish canning factory is in Figure 4. 10 where the capacity of tuna that can be processed is 2 tons of raw fish in 8 hours. The overall yield from raw material processing to canned fish reaches 50-55% of the raw material (FAO,).

Investment Feasibility Analysis

Investment feasibility

Analysis The selar fish canning factory is carried out by setting 2021 as the initial year or year 1 so that the costs used are the costs that apply in that year. All costs incurred are divided into two parts, namely fixed costs and variable costs. The cost of the selar fish canning factory in 2021 which can be seen in Table 3.

Table 2. Investment costs of the Selar fish canning factory in 2021

No	Komponen Biaya	SATUAN	Jumlah Fisik	Harga per Satuan Rp	Jumlah Biaya Rp	Umur Ekonomis (tahun)	Nilai Penyusutan Rp	Nilai Sisa Proyek Rp
1	Perizinan		1	30.000.000	**30.000.000**			
2	Bangunan	m^2	450	250.000	**112.500.000**	10	**11.250.000**	78.750.000
3	Tanah	m^2	600	150.000	**90.000.000**			90.000.000
4	Kendaraan							
	a. Forklift	unit	3	300.000.000	**900.000.000**	7	128.571.429	514.285.714
	b. Pick Up	unit	1	35.000.000	**35.000.000**	7	5.000.000	20.000.000
	c. Sepeda Motor	unit	1	7.500.000	**7.500.000**	7	1.071.429	4.285.714
5	Alat produksi dan Pengemas							
	1. Tuna vacuum	unit	1	254.934.000	**254.934.000**	10	25.493.400	
	2. Tuna Filler	unit	1	3.611.565.000	**3.611.565.000**	10	361.156.500	361.156.500
	3. Filling and closing	unit	1	283.260.000	**283.260.000**	10	28.326.000	28.326.000
	4. Retort	unit	1	73.647.600	**73.647.600**	10	7.364.760	7.364.760
6	Peralatan lainnya							
	c. Mesin Tik	unit	1	500.000	**500.000**	3	166.667	
	d. Papan Nama	unit	1	400.000	**400.000**	3	133.333	
	e. Cap Merek dan Kode Produksi	unit	1	30.000.000	**30.000.000**	3	10.000.000	
	Jumlah				**5.429.306.600**		**578.533.517**	**1.104.168.689**

Source: Processed by Researchers 2021

Table 2 shows that the largest cost incurred in the selar fish canning factory comes from variable investment costs of Rp 5,429,306,600.00 in the first year, all procurement costs were invested to support business needs. The following are theprocurement costsincurred by the selar fish canning factory from the beginning of the development of the sales system. Thesecosts procurement are incurred in the first year of the company's establishment.

Table 3. Production Costs for the fish canning industry in 2021

No	Struktur biaya	Satuan	Jumlah Fisik	Biaya per satuan Rp	Jumlah biaya 1 bulan Rp	Jumlah biaya 1 tahun Rp
1	**Bahan baku**					
	ikan selar	kg	73.945	50.000	3.697.250.000	44.367.000.000
2	**Bahan Pengasin**					
	a. Garam	kg	1.500	300	450.000	5.400.000
	b. Saus	kg	4.500	250	1.125.000	13.500.000
3	**Bahan Pembantu**					
	a. Air bersih	liter	150	1.200	180.000	2.160.000
	b. Sabun	bungkus	30	2.000	60.000	720.000
	c. Alas jerami	Kg	1	25	13	150
	d. Bensin	liter	350	2.800	980.000	11.760.000
4	**Bahan Pengemasan**					
	a. Pengemas plastik	unit	6.250	150	937.500	11.250.000
	b. Peti Kemas Kayu	Unit	500	15.000	7.500.000	90.000.000
5	**Tenaga Kerja Langsung**					
	a. Penyiapan Bahan	Orang	3	2.500.000	7.500.000	90.000.000
	b. Pemotongan	Orang	10	2.500.000	25.000.000	300.000.000
	c. Pencucian	Orang	4	2.500.000	10.000.000	120.000.000
	d. Perebusan + pengemas	Orang	3	2.500.000	7.500.000	90.000.000
	Total Biaya Variabel				3.758.482.513	45.101.790.150

Source: Processed by Researchers 2021

Production Cost (Production Cost) is the amount of funds that must be spent to finance all mining production activities until they are ready for sale. These production costs include direct production costs and indirect production costs. In order to

calculate the cost of mining operations in one production period, several aspects to be considered are: Planned production targets, Operated equipment, Supporting equipment, Human Resources to carry out Operations. the biggest costs incurred in the fish canning factory came from variable costs of Rp. 3,758,482,513.00 per month and Rp. 45,101,790,150.00 per year. Revenue is obtained from the number of sales units of canned selar fish multiplied by the selling price per kg. The amount of output produced is 73,206 kg per month with a set average selling price of Rp. 60,000.00 per kg, so that the average revenue is Rp. 4,392,333,000.00 per month.

The investment feasibility analysis is carried out using an analysis period of 3 years for business development based on the longest economic life of the equipment used, so that it can carry out business planning in the future. Financial analysis is carried out with the aim of determining investment plans through the calculation of expected costs and benefits by comparing expenses and income through calculation assumptions (Hidayati, Tan, & Yamu, 2020). The calculation of business feasibility is carried out through investment criteria, including: Net Present Value (NPV), Internal Rate of Return (IRR), Net Benefit Ratio (Net B/C), Break Even Point (BEP) and Pay Back Period (PBP) (Schlotterer et al., 2009). The interest rate applied to the calculation results of the investment feasibility analysis follows the commercial micro-credit interest rate of 14% (Rachim et al., 2021). In more detail, the results of the analysis of the feasibility of investing in the fish canning plant can be seen in Table 4.

Table 4. Cash flow (investment feasibility analysis)

No	Uraian	Tahun			
		0	1	2	3
A	**Arus Masuk**				
	1. Total Penjualan		52.707.996.000	52.707.996.000	52.707.996.000
	2. Kredit				
	a. Investasi	3.800.514.620			
	b. Modal Kerja		3.966.524.638		
	3. Modal Sendiri				
	a. Investasi	1.628.791.980			
	b. Modal Kerja		1.699.939.131		
	4. Nilai Sisa Proyek				1.104.168.689
	Total Arus Masuk	**5.429.306.600**	**58.374.459.769**	**52.707.996.000**	**53.812.164.689**
	Arus Masuk unt Menghitung IRR	**-**	**52.707.996.000**	**52.707.996.000**	**53.812.164.689**
B	**Arus Keluar**				
	1. Biaya Investasi	5.429.306.600	-	-	3.611.565.000
	2. Biaya Variabel		45.101.790.150	45.101.790.150	45.101.790.150
	3. Biaya Tetap		49.920.000	49.920.000	49.920.000
	4. Angsuran Pokok		2.589.013.086	2.589.013.086	2.589.013.086
	5. Angsuran Bunga		921.257.156	558.795.324	196.333.492
	6. Pajak		881.474.276	935.843.551	990.212.826
	7. Biaya Pemasaran/Distribusi		180.000.000	180.000.000	180.000.000
	Total Arus Keluar	5.429.306.600	49.723.454.669	49.415.362.112	52.718.834.554
	Arus Keluar unt Menghitung IRR	**5.429.306.600**	**46.213.184.426**	**46.267.553.701**	**49.933.487.976**
C	**Arus Bersih (NCF)**	-	8.651.005.100	3.292.633.888	1.093.330.134
D	**CASH FLOW UNTUK MENGHITUNG IRR**	**(5.429.306.600)**	**6.494.811.574**	**6.440.442.299**	**3.878.676.712**
	Discount Factor (14%)	**1,0000**	**0,8772**	**0,7695**	**0,6750**
	Present Value	**(5.429.306.600)**	**5.697.203.135**	**4.955.711.218**	**2.617.996.301**
E	**CUMMULATIVE**	**(5.429.306.600)**	**267.896.535**	**5.223.607.753**	**7.841.604.054**
F	**ANALISIS KELAYAKAN USAHA**				
	NPV (14%)	Rp 7.841.604.054			
	IRR	97,84%			
	Net B/C	2,44			
	PBP	2,769488	tahun		

Source: Processed by Researchers 2021

Table 4 shows the cash flow (net cashflow) of the fish canning factory in Sorong Regency, West Papua Province in normal state. Cash flow (net cashflow) consists of cash inflows (inflows) and cash(outflowsoutflows). Cash inflows are obtained from the number of units sold for marning corn multiplied by the selling price per kg. The amount of output produced at the beginning of the production preparation year is 73,206 kg per year with a set average selling price of Rp. 60,000.00 per kg.

The value of profit (net benefit) in the 1st year has a negative value of –Rp 5,429,306,600.00. This happens because that year is a year of preparation for business development, so that profit gains are still in the stage of returning the investment capital that was issued at the beginning of production preparation. The profit received by business actors is influenced by the difference in the amount of marning corn produced and the costs incurred. In the years of business development, the profits obtained by business actors continue to increase.

Based on the cash flow (net cashflow) the results of the analysis of investment criteria on the final balance sheet of the Selar Fish Canning Factory Kab. Sorong, West Papua, can be seen in Table 5.

Table 5. Results of analysis ofcriteria cashflow for the selar fish canning factory

Kriteria Investasi	Standar	IRT Pabrik Pengakalengan ikan	Keterangan
NPV	>0	Rp7.841.604.054	Layak
IRR	>16,75%	97,84%	Layak
Net B/C	>1	2,44	Layak
PBP	< Periode maksimum	2 Tahun 7 Bulan 2 Hari	Layak

Source: Processed by Researchers 2021

Table 5 describes the results of the analysis ofcriteria cashflow for the selar fish canning factory based on the value of NPV, IRR, Net B/C, Break Even Point, and Payback Period.

Net Present Value (NPV)

The Net Present Value (NPV) in Table 5 shows that the NPV has a positive value of IDR 7,841,604,054.00 during the 3-year project life. This shows that the net benefits received by the selar fish canning factory are profitable during the 3 year project life according to thetime value of money, namely net profit more than zero (NPV > 0) with a prevailing interest rate of 16.75%. so it can be said that it is worth working on. In addition, there is a negative NPV calculation to show the limits on the interest rate that can be met by business actors until they reach the lowest loss limit. Based on the method,trial and error the factor discount rate on a negative NPV is 97.84% with a negative profit of – Rp. 5,429,306,600.00, meaning that 97.84% is the maximum interest rate limit that can be met by the perpetrators. business in canning fish selar so as not to suffer losses. The results of this study are in line with research (Dewi, Kaniawati, & Suwarma, 2018) that the Net Present Value value greater than 0 indicates a feasible business to run.

Internal Rate of Return (IRR)

The value of the Internal Rate of Return (IRR) is obtained through thecalculation method trial and error. Based on the results of the calculation of the IRR value of the selar fish canning factory is 97.84%. This shows that the selar fish canning factory is able to achieve profits with an IRR value greater than the prevailing interest rate of 14%, meaning that the maximum level of ability that can be paid by the corn marning business actor due to the use of production factors is 61%. The capital invested in the business has a favorable rate of return compared to investing in a bank (Nurainy, Nawansih, & Sitanggang, 2015). The results of this study are in line with research (Dewi et al., 2018) that the IRR value is greater than the prevailing interest rate (DF = 16.75%) then the business is feasible to run.

Net B/C

Net B/C is a comparison between the present value of cash in and the present value of cash out. Table 5 shows the value of Net B/C obtained from the corn marning business in Karang Anyar Village is 2.44, meaning that the output produced is 2.44 times greater than the costs or inputs

incurred. When the business spends Rp. 1.00, it will earn a profit of Rp. 2.44. The fish canning business in Sorong Regency can be said to be financially feasible to operate because the Net B/C value is greater than 1 (Net B/C>1). The results of this study are in line with research (Dewi et al., 2018) that the Net B/C Ratio value is greater than 1 which indicates the business is feasible to run.

Payback Period (PBP)

Payback Period measures how quickly the invested investment can return. Based on the calculation results, the PBP value is 2.769, which means that the selar fish canning factory shows that the revenue obtained is the same as the investment value spent at the project age for 2 years 7 months 6 days. A short and relatively good time to make a capital turnover in order to increase investment in the selar fish canning factory. The results of this study are in line with research (Dewi et al., 2018) that the Payback Period is smaller than the economic life of the business for 3 years, so the business is feasible to run.

CONCLUSIONS

The results of the calculation of the investment feasibility analysis with a commercial interest rate of 14.00% in a 3-year business period, indicate that the canning plant for lard is feasible to run and develop. The results of the investment criteria are the NPV of Rp. 7,841,604,054.00 greater than zero, the IRR value of 97.84% greater than the interest rate of 14% and the Net B/C value of 2.44 greater than one. The payback period is reached in a period of 2 years 7 months 6 days, meaning that this business can cover the initial investment costs before the end of the business life. The sensitivity analysis carried out shows that the canned fish canning factory is feasible to run as long as the project is running according to the assumptions and technical parameters specified.

Based on the investment feasibility analysis, the fish canning factory in Sorong Regency, West Papua is economically feasible, it is recommended that fish processing industry business actors can improve the quality and selling price, including expanding the market network so as to make better business prospects.

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