

# ECONOMIC PERFORMANCE OF MANGROVE CRAB FISHERY BUSINESS IN MOJO MANGROVE ECOSYSTEM AREA, PEMALANG REGENCY, CENTRAL JAVA, INDONESIA

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## ABSTRACT

The mangrove ecosystem in the Mojo Village Coastal Area, Pemalang Regency, Central Java Province is one of the potential sources of mangrove crabs. The high market demand has led to overexploitation as indicated by a decrease in catch and a decrease in the average size caught. The fishing of mangrove crabs in the Mojo Mangrove Ecosystem, Pemalang Regency can be caught any time, depending on the type of fishing gear used. The fishing gear used includes scoop nets, folding traps (local term: *bubu*), fishing rods, and trammel nets. The reduction in the production of mangrove crabs and the decrease in the average size caught can lead to a decline in fishermen's income. This study aims to examine the economic performance of the mangrove crab fishery business in the Mojo Coastal Area and assess the feasibility of the business. The research method used was a survey method. Data analysis included profit analysis, revenue cost ratio (R/C ratio), Return of Investment (ROI) and Payback period (PP). The results show that the mangrove crab business both catching and farming are known to be still profitable to do. Folding traps (*bubu*) fishermen who operate the fishing gears at sea earned the highest net income, i.e. an average of IDR 5,127,451/month. The highest value of R/C ratio was in catching mangrove crabs using fishing rods, which was 3.9. The highest ROI value (11,294%) and the fastest return are found in investment on crab fishing activities using a scoop net, with a payback period of 3 days. Soft shell crab farming is economically feasible to be continued with an average profit of IDR 8,150,125/month, R/C value of 1.22, Payback Period was 2 years 2 months and 242% ROI.

**Keywords:** mud crab; feasibility; essential ecosystem area

## INTRODUCTION

Mangrove crab or mud crab is one of the fishery commodities from mangrove forests in coastal areas that has high economic value because they are very popular to both domestic and foreign consumers. Indonesia ranked the second as the country with the most mangrove crab production (Hungria et al., 2017), and was the fifth top exporter for the crab industry in the global supply chain, along with Russia, the United States, China, and Canada (Research and Markets, 2018). The export value of Indonesian crab fishery commodities in 2019 ranked the third after shrimp and tuna-mackerel tuna-jack skip (skippers) tuna, with a volume of 25.942 tons and a value of 393.497.774 USD or around IDR 5,64 trillion (Ministry of Marine Affairs and Fisheries, 2020).

The mangrove ecosystem in the Mojo Coastal Area, Pemalang Regency, Central Java Province, Indonesia is one of the potential sources of mangrove crabs or also popularly called mud crab. The potential area of mangrove life is 425 ha, which is used as a pond for the cultivation of milkfish, white-leg (*vannamei*) shrimp and soft-shell crab (Renta, 2016; Cerlyawati et al., 2017; Department of Environment and Forestry of Central Java Province, 2018). The catching activities of mangrove crab in the Mojo Coastal Mangrove

Area is generally carried out by artisanal fishermen and crab seekers.

The catching activities of mangrove crabs in the Mojo Mangrove Ecosystem are carried out all the time, both day and night, depending on the type of fishing gears used. The fishing gears used to catch mangrove crabs in the Mangrove Ecosystem of Mojo include fishing rods, square or dome shaped folding traps (Local term: *bubu*), fishing rods, and trammel nets. Mangrove crab catching activities in Mojo Village are carried out in mangrove forests, ponds, river estuaries and lagoons (Hapsari et al., 2020).

Several formal regulations for the mangrove crab fishing business have been issued by the Government of Indonesia through the Ministerial Regulation of Marine Affairs and Fisheries Regulation No. 1 Year 2015 in conjunction with (local term: *juncto*) Ministerial Regulation of Marine Affairs and Fisheries No. 56 Year 2016 in conjunction with Ministerial Regulation of Marine Affairs and Fisheries No. 12 Year 2020 in conjunction with Ministerial Regulation of Marine Affairs and Fisheries No. 17 Year 2021 in conjunction with Ministerial Regulation of Marine Affairs and Fisheries No. 16 Year 2022 concerning Lobster Management (*Panulirus spp.*), Crab (*Scylla spp.*), and Crab (*Portunus spp.*) in the Territory of the Republic of Indonesia. The ministerial regulation regulates the minimum

fishing size for mangrove crabs (width of the carapace must be >12 cm), catching must be carried out using passive and environmentally friendly fishing gears and prohibits catching female crabs in spawning conditions (except for period of December to the end of February). The size of the crab for farming is at least 30 grams per crab and the cultivator must have hatchery facilities and infrastructure that have produced crab seeds no later than the third year.

Based on the results of the analysis of the biological condition of the mangrove crab population in the Mojo Mangrove Ecosystem, it was found that the majority of the size structures caught was young (carapace width was < 12 cm), i.e. 98.82% male and 98.31% female. This illustrates that fishing activities have not considered the selectivity of the catch because all size of crabs are marketable. The high market demand has led to overexploitation of the nature as seen in the decrease in catch and a decline in the average size of the caught crab. The average catch per unit effort (CPUE) for the last 3 years has decreased with an exploitation rate of 0.79 (male crabs) and 0.55 (female crabs). Moreover, the size of the mangrove crabs caught is getting smaller and there has been a range collapse in mangrove crab resources in the mangrove ecosystem of the Mojo coastal area. In 2015 the number of mangrove crabs deposited to a collector averaged 200 kg per day, but in 2020 it only reached 40 kg per day (Hapsari et al., 2021).

The decline in the production of mangrove crabs and the decrease in the average size caught can lead to a decrease in fishermen's income which will eventually reduce the profits earned. Furthermore, the decreasing availability of hi-quality mangrove crab seeds in the nature has made it difficult for the farmers to obtain raw materials for soft-shell crab farming. Soft-shell crab farming requires seeds in the size ranging from 60 to 120 grams or size 10-15, i.e. in 1 kg there are 10-15 crabs requiring the seeds to be in healthy condition, active movement, not deformed, smooth shell and good color (not pale)).

Based on the background of the problems previously described, this paper aims to examine the economic performance of the mangrove crab fishery business in the Mojo Coastal Area and to assess the feasibility of the business, because so far, the business actors have never economically calculated the overall analysis of the fishery business carried out. Business transactions were never recorded and managed properly. In addition, transactions are only recorded in piles of notes so that it is difficult for business actors to monitor the development of their business. Business performance analysis will provide information concerning a business being run whether it is profitable or unprofitable.

## RESEARCH METHODS

This study was conducted in the Coastal Area of Mojo Village, Ulujami subdistrict, Pemalang Regency, Central Java, Indonesia. At this research location, there is an intensely increasing activity of catching mangrove crabs since the business of fattening mangrove crabs and soft-shell crab developed in Mojo Village, Ulujami Subdistrict in 2005. This research used a survey method conducted through in-depth interviews and direct observation. The sampling method used

was snowball sampling technique. The number of fishermen interviewed during the research was 73 people, consisting of 16 people with fish pot or fish trap (local term: *bubu*), 12 trammel nets, 8 fishing rods and 37 scoop nets. In addition, there were 3 soft-shell (local term: *soka*) crab farmers interviewed as the respondents.

## Method Of Data Analysis

### Business Analysis of Mangrove Crab Fishery

Analysis of financial business is to measure the business performance of mangrove crab fishery done by assessing the benefits of investment in a business (Zain et al., 2016; Prasetyo et al., 2016; Rini et al., 2017). In analyzing the mangrove crab fishery business, the variables used include investment costs, fixed costs, variable costs, maintenance costs, depreciation, income, and profits. In the business analysis, some analyses are necessarily carried out including profit analysis or operating income analysis, income and cost balance analysis (R/C ratio), Return of Investment (ROI) analysis and Payback period (PP) analysis (Sugeng, 2017; Saebani 2018).

### Profitability Analysis

Revenue/earnings in the mangrove crab fishery business is defined as the sales value of the results of catching/cultivating mangrove crabs. According to John (2020) business profits are obtained after the earnings or revenue from the sale of the catching results is reduced by total cost (fixed costs and variable costs). Profitability is calculated by the following formula:

$$\pi = TR - TC = \text{Total Revenue} - \text{Total Cost} \dots \dots \dots (1)$$

Description:  $\pi$  = Profit, TR = Total Revenue (catching result x price of mangrove crab), TC = Total Cost (Fixed cost + variable cost); with criteria: TR > TC, means the business makes a profit, TR = TC, means the business is at the break-even point and TR < TC, means the business suffers a loss.

### Analysis of Business Feasibility

The analysis was carried out using several indicators including Revenue Cost of Ratio (R/C ratio), Return on Investment (ROI) and Payback period of Capital (PP) (Kasmir & Jakfar, 2016; Wati and Primyastanto, 2018; Poltak & Muhfizar, 2020; Amruddin et al 2021). The formulas used for analyzing R/C ratio, ROI, and Payback period are as follows:

#### 1. Analysis of Revenue and Cost (R/C ratio)

Analysis of Revenue and Cost Ratio is intended to determine the comparison of revenue and production cost values used. The efficiency level of a business is generally measured by calculating the balance between the revenue of the business and the total cost of production. To measure the efficiency of a business, the following R/C ratio analysis is used.

$$R/C = \frac{\text{Total Revenue}}{\text{Total Cost}} \dots \dots \dots (2)$$

Description: R/C = Balance of Revenue and Cost, TR = Total Revenue, TC = Total Cost, with criteria: R/C > 1, the business activity is feasible to be worked (*feasible*), R/C < 1, the business activity is not feasible to be worked (*not feasible*),

R/C = 1, the business activity is at the break-even point (*Break Event Point*).

### 2. Return of Investment (ROI)

ROI is the ability of the invested capital in the whole activities to earn a net profit. ROI shows the efficiency of using the calculated investment.

$$ROI = \frac{\text{Profit}}{\text{Investment Cost}} \times 100 \% \dots\dots\dots(3)$$

Criteria:

The greater the ROI means the more efficient the use of investment will be or in other words a production process can return the ROI investment.

### 3. Payback Period (PP)

Payback period is the period of time required to return the investment. The smaller the PP means the better because the rate of return on investment is faster in one year. The faster the payback time leads to the better to work on it.

$$PP = \frac{\text{Investment Cost}}{\text{Average Net Benefit per year}} \dots\dots\dots(4)$$

## RESULT AND DISCUSSION

### Mangrove Crab Fishing Pattern from Mangrove Mojo

The fishing activities of Mangrove crab in Mojo Village are carried out in mangrove forests, ponds, river estuaries and lagoons. There are approximately 225 fishermen who depend on their income from mangrove crab resources in Mojo Village. Mangrove crab fishing in the Mangrove Waters of Mojo Village is generally carried out by artisanal fishermen and crab seekers. These activities are done individually or in groups. Moreover, mangrove crabs are caught at any time of the day or night, depending on the type of fishing gear used.

The fishing gears used to catch mangrove crabs in the Mojo Mangrove Ecosystem are scoop net (local term: *serok*), *bubu* (square or dome folding traps), fishing rods, and trammel nets (Hapsari et al., 2020). The majority of *bubu* fishermen in Mojo Village set their fishing gears in the afternoon and haul them in the early morning, while crab seekers who use traps in ponds can operate the traps at any time. Trammel net fishing gear is operated by fishermen in the afternoon until dawn. Meanwhile, the scoop nets and fishing rods are operated during the day, but if the fishermen want to use them at night, they are commonly equipped with lighting (lights or LED headlights).

The activities of mangrove crab fishing are carried out throughout the year. In addition, the season for many catches usually arises during rainy season. The peak season occurs 2-3 months after the rainy season. Furthermore, the peak season occurs during the west wind/west monsoon wind season (February - May), while the common season takes place in June - July and December - January. At last, the famine season is during August - November.

The fishing model for local fishermen is a one-day trip. Thus, the catch is conducted every day. Many mangrove crabs are caught at night. During the day, they immerse themselves, and then appear to actively move around by sunset (Mirera, 2017).

Anthropogenic pressure towards mangrove crab in the Mojo mangrove ecosystem increases during the west season (rainy season). This is probably due to the fact that during the rainy season many mangrove crabs carry out their reproductive phase (Viswanathan et al., 2019; Ali et al., 2020). The

difference peak of reproductive seasons may be related to the suitability of aquatic environmental conditions in supporting the reproductive process. Thus, there is a possibility that the peak reproductive season can change from year to year since it is closely related to global climate changes (Riani E, 2017; Rahman et al., 2020; Bir et al., 2020)

During the west monsoon season, the number of fishermen catching mangrove crabs in mangrove ecosystem and ponds also highly increases. During the west season, many fishermen do not go to sea. The west monsoon season, known as the rainy season, is characterized by high rainfall accompanied by winds and storms. Fishermen do an adaptation strategy by looking for substitute commodities as a source of livelihood by switching to catching crabs in the mangrove ecosystem in Mojo coastal area. Moreover, the catch of each trip during the west season ranges from 20-50 crabs and the majority size is in adult size. In contrast, during the east season the result only ranges between 5-10 crabs and is small in size.

### Analysis of Mangrove Crab Catching Business

A study of business analysis is conducted to see whether the activities carried out can provide the benefits or whether the activities are feasible. Business analysis is performed by calculating revenues, expenses, profits, Return on Investment (ROI), business ratio (R/C) and payback period (PBP). Through this calculation, it can be described that the business feasibility of mangrove crab fishery in Mojo Village, Pematang Regency, can be considered for making decisions regarding the business continuity. Furthermore, business analysis researches are studies concerning on business activities that not only analyze whether the business is feasible or not to be established, but also when the business is routinely operated to earn maximum profits (Khairini et al, 2021; Imron et al, 2021).

### Profitability of Mangrove Crab Fishermen

The income from mangrove crab catching business is calculated through a net benefit calculation approach. The catch of mangrove crab fishermen from the Mojo mangrove ecosystem ranged from 25.60-142.11 kg/month, with fishing activities ranged from 15-26 trips/month and the selling price mostly ranged from IDR 50,000 – 85,000/kg. Investment costs greatly vary depending on the fishing gears used. The average investment costs, total costs, total revenues and profits per year obtained by mud crab fishermen are elaborated in the following Table 1.

The investment cost component and the cost component of each fishing gear are varied. *Bubu* and trammel nets require more costs than fishing rods and scoop nets because they require a fishing fleet for their fishing activities, while fishing rods and scoop nets can be operated by land-based fishing. The investment cost of *bubu*/folding trap fishermen in the sea is much higher than those using other fishing gears, *i.e.* IDR 50,425,000. The biggest investment was spent on buying a boat which averagely cost IDR 32,000,000 with a 10-year technical life and the smallest investment was spent for buying a basket (plastic basket, jerry can or bucket) as a place to put the catch results with an average cost of IDR 34,081.

Based on the results of interviewing 10 fisherman respondents who operate *bubu* traps fishing gear in the sea and 12 trammel net fishermen, it can be noticed that the fixed cost is greater than the fixed cost incurred by fishermen using other fishing gears. This probably is due to the high level of damage to fishing gears. Fisherman using *bubu* usually replace their

fishing gears every 6 months and trammel net fishermen need to change their fishing gears every 2 months. To deal with the amount of routine costs that must be incurred, trammel net fishermen usually replace only 50% of their fishing gears every 2 months, and the remaining 50% which can still be repaired will be repaired by themselves.

The income of mud crab fishermen is greatly influenced by the season, the fishing gears used, the quality of the catch and the duration of the catching operation. The selling price of mangrove crabs per kg determines the amount of income earned by fishermen. During the peak season, it will be easier to get adult mangrove crabs so the selling price as much as  $\geq$  IDR 85.000/kg can be obtained by fishermen, while during the famine season, the majority of mangrove crab catches are in the *kroyo* (young crab) and *cemet* (juvenil) categories, with a price ranging from IDR 30,000 to 60,000/kg.

The selling price is determined by the collectors by grading based on size, quality, completeness of limbs,

freshness of the crabs and egg capacity. *Bubu* fishermen who operate fishing gears at sea frequently get the highest net income, with an average of IDR 5,127,451 per month, followed by trammel net fishermen, fishing rods, *bubu* trap fishermen in lagoons/estuaries and mangrove crab seekers with scoop nets.

### Criteria of Analyzing Mangrove Crab Catching Business

Analysis of mangrove crab catching business was carried out using three criteria, i.e. R/C ratio, ROI (Return of Investment) and payback period. Based on the calculation, it was obtained that the R/C ratio was  $> 1$  on all fishing gears with the target of mangrove crabs, both for fishermen who use boats and those by land-based fishing. This result shows that the business of catching mangrove crabs in the Mojo mangrove ecosystem is profitable. A fishery business is feasible to be continued if the result of the R/C analysis is more than 1 (Nababan et al., 2020; Irnawati et al, 2021).

**Table 1.** The Performance of mangrove Crab Business in Mojo Village

Description	<i>Bubu</i> in the lagoon (IDR)	Trammel net (IDR)	Fishing rod (IDR)	Scoop net (IDR)	<i>Bubu</i> in the sea (IDR)
Investment Cost	14,825,000	32,908,333	835,000	289,108	50,425,000
Total Cost	23,409,056	40,296,500	17,601,563	12,049,068	52,777,700
a. Fixed Cost	6,513,056	20,130,833	459,063	138,041	16,936,500
b. Variable Cost	16,896,000	20,165,667	17,142,500	11,911,027	35,791,200
Total Revenue	70,083,333	101,254,167	68,647,500	44,988,649	126,289,000
Profit	46,674,278	58,539,667	51,045,938	32,939,581	63,454,417
Profit per month	3,889,523	4,878,306	4,253,828	2,744,965	5,127,451

**Table 2.** Feasibility Criteria of Mangrove Crab Catching Business in Mojo Village

Description	<i>Bubu</i> in lagoon/estuaries	Trammel net	Fishing rods	Scoop nets	<i>Bubu</i> in the sea
R/C ratio	2.99	2.42	3.9	3.73	2.39
ROI	215%	99.8%	6,013%	11,294%	46%
Payback period	1.1 year	5.6 months	6 days	3 days	6.3 months

Based on the values listed in Table 2, it can be seen that the mangrove crab fishery using *bubu* traps, trammel nets, fishing rods and scoop nets has good revenue, since it has an ROI value which is greater than the investment interest rate. The ROI value is a multiple of the amount of investment which can be returned if the fishery business is carried out showing the profit obtained from each amount of money invested. The higher the value of the calculation results obtained means the better business it is (Hapsari et al., 2018; Haris, 2019). In terms of ROI, all of these fishing businesses can be financially relied on to support the development of mangrove crab fishery in Mojo Village. The ROI value of all fishing gears is higher than the deposit interest rate or some other investment instruments. In addition, the largest ROI was found in the mangrove crab catching business using scoop net fishing gear, i.e. 11,294%. This value shows that every capital of IDR 100 will earn a profit of IDR 11,294, or in other words the average total investment cost for catching mud crabs using scoop net of IDR 289,108 will be able to provide an average profit rate of 11,294%.

The Payback Period (PP) analysis of the mangrove crab catching business in the Mojo Mangrove Ecosystem aimed to see the length of time it takes to return the investment spent, or in other words to see the period of investment return that has been spent by calculating the profits earned from a business. Based on the time period for the return on investment of all fishing gears, i.e. less than 3 years, the business of catching mangrove crabs in the Mangrove Ecosystem of Mojo Village is considered good and feasible. The fastest return on investment was obtained from scoop net fishing gear with a payback period of 3 days and the longest payback period is by *bubu* fishing traps in the lagoon with a PP value of 1.1 years.

### Analysis of Soft-Shell Crab farming Business

Mangrove crab farming activities that are still routinely carried out in Mojo Village are soft-shell (local term: *soka*) crab cultivation, which has been carried out since 2006. Technically the farming activity consists of 7 stages, including: land preparation stage for ponds, seed stocking, feeding, maintenance, harvesting, selection stage and marketing stage.

The number of soft-shell crab farmers is decreasing from year to year. In 2014 the number of farmers was 16 people with a total production of 388,835 kg and a production value of IDR 23,330,100,000 (Department of Marine Affairs and Fisheries, Pemalang Regency, 2015). It decreased to 9 people in 2017 (Khotimah et al., 2018), and currently there is only 1 farmer who still routinely conducts soft-shell crab farming activities.

The size of the pond used in the soft-shell crab farm business in Mojo Village employs a pond with an area of approximately 1 Ha. The number of mangrove crab seeds used is usually 300 kg per cycle (15 days), with sizes between 50-100 grams. The soft-shell crab farm system uses the surface of the pond waters and crab boxes filled with one crab. The harvesting stage is carried out in 1 cycle, consisting of 15 days per cycle, and the harvesting activities are not carried out simultaneously in one time for all boxes, yet the harvesting is done per crab. When the crabs molt, they can be harvested.

After the harvesting stage, there is a selection stage conducted to determine the price of the soft-shell crab. There are 2 categories of soft-shell crabs, i.e. grade I and grade II crabs. Grade I crab is a soft-shell crab whose limbs are complete and there are no defects at all. Such crab has a selling value of IDR. 115,000 per kg. Meanwhile, grade II crabs are crabs whose limbs are incomplete or unhealthy, with a selling price of IDR 100,000 per kg.

The largest investment value is the cost of purchasing ponds for soft-shell crab farming, i.e. IDR 100,000,000 with a percentage of 44.74%, and the lowest value is the cost of other equipment (raft rope, flashlight and batteries, scissors, gloves, seed basket, soft-shell basket, chair, hat, knife, hose, towel, soaking bucket) with a percentage of 0.22%.

Based on Table 3, it can be seen that the variable costs are higher than the fixed costs, i.e. IDR 413,760,000 with a percentage of 92.92% and IDR 29,288,500 for fixed costs with a percentage of 7.1%. The largest variable cost is the purchase of seeds as high as IDR 306,000,000 with a percentage of 73.96% and the lowest variable cost is the cost of electricity, i.e. IDR 1,200,000 per year with a percentage of 0.29%. The highest fixed cost is on the depreciation of the raft, IDR 8,860,000 with a percentage of 26.5% and the lowest fixed cost is on the maintenance of other equipment as much as IDR 100,000 or 0.3%.

Based on the results of the business analysis, it shows that the soft-shell crab farming business in Pemalang Regency is still considered profitable. This is proven by the average profit per month of IDR 8,150,125, 1.22 (more than 1) R/C value, the payback period is 2 years and 3 months and the return on investment (ROI) is 242%. According to the research conducted by Khotimah, *et al.* (2018), soft-shell crab farmers in Mojo Village earn IDR 21,364,575 per month in average with the number of seeds used as much as 550 kg (weighing around 100 g per crab). Based on this description, it can be concluded that the profit of soft-shell crab farmers in Mojo Village from 2017-2021 has decreased by 62% and the average number of seeds stocked has also declined by 45%, along with the decreasing availability of high-quality seeds from the nature. The business constraint is due to the fact that the farming activities still largely rely on seeds obtained from the natural seeds caught by fishermen. Soft-shell crab farming requires *kroyo* (small sized crab/seeds) in the crab size ranging from 60-100 grams or size 10-15 (Fujaya et al., 2019). Thus, in 1 kg there are 10-15 crabs with such seed requirements as they are in healthy condition, active movement, not deformed, have

smooth shell and good color (not pale) (Saidah et al., 2016; Masitah et al., 2019; Iromo et al., 2021).

**Table 3.** Business Analysis of soft-shell Crab Farming

No	Description	Amount (IDR)
<b>A.</b>	<b>Total Revenue</b>	540,850,000
<b>B.</b>	<b>Total Cost</b>	443,048,500
	<b>Investment Cost</b>	
1	Pond	100,000,000
2	Bridge	8,000,000
3	Waiting houses	45,000,000
4	Rafts	3,500,000
5	Machines	4,000,000
6	Crab box	55,000,000
7	Freezer box 3 unit	7,500,000
8	Other equipment	500,000
	Total investment	223,500,000
	<b>Fixed Cost</b>	
1	Pond Maintenance	3,000,000
2	Bridge Maintenance	2,520,000
3	Raft Maintenance	2,500,000
4	Waiting House Maintenance	3,600,000
5	Machine Maintenance	1,200,000
6	Crab-box Maintenance	575,000
8	Refrigerator Maintenance	250,000
9	Other Equipment Maintenance	100,000
10	Pond Depreciation	500,000
11	Bridge Depreciation	3,650,000
12	Raft Depreciation	560,000
13	Waiting House Depreciation	4,350,000
14	Machine Depreciation	200,000
15	Crab-box Depreciation	4,975,000
17	Refrigerator Depreciation	860,000
18	Other Equipment Depreciation	448,500
	Total of Fixed Cost	29,288,500
	<b>Variable Cost</b>	
1	Seeds of soft-shell Crab (IDR60.000x 300 Kg x 24 Cycles/Year)	306,000,000
2	Feeds (IDR5.000 x 5 Kg x 3 Times x 15 days x 24 Cycles/Year)	27,000,000
3	Employees' salary (IDR3.000.000 x 2 Employees x 12 Months/Year)	72,000,000
4	Electricity (IDR 100.000 x 12 Months/Year)	1,200,000
5	Gasoline (IDR 9.000 x 39 Liter x 24 Cycles/Year)	7,560,000
	Total of Variable Cost	413,760,000
	<b>Profit per year</b>	97,801,500
	<b>Profit per month</b>	8,150,125



No	Description	Amount (IDR)
	R/C ratio	1.22
	Payback period	2.29
	Return of Investment	242%

## CONCLUSION

The analysis results show that both mangrove crab catching and soft-shell crab farming businesses are considered to be still profitable and income-generating. Most business actors, 90%, earned above the regency minimum salary (local term: *Upah Minimum Kabupaten/UMK*). *Bubu* fishermen who use the fishing gears in the sea earned the highest net income, IDR5,127,451/month in average, followed by trammel net fishermen, fishing rods, *bubu* trap fishermen in the lagoon and mangrove crab seekers using scoop nets. The highest R/C ratio was in mangrove crab catching business using fishing rods, i.e. 3.9 and the lowest was in trammel net fishing gear with a value of 2.35. The highest ROI value (11,294%) and the fastest return on investment were found in mangrove crab fishing activities with a scoope net, with a payback period of 3 days. The lowest ROI was on fishing with *bubu* traps operated at the sea (46%) and the longest payback period was for fishing activities with *bubu* traps operated in the lagoon, with a payback period of 1 year and 1 month. Soft-shell crab farming is economically feasible to be sustainably conducted with an average profit of IDR 8,150,125/month, 1.22 R/C value, 2 year and 2 month-payback period (PP) and 242% return on investment (ROI).

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