



# Financial and social benefits of partnerships between capital owners and shrimp trammel net fishermen in East Kalimantan, Indonesia

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**Abstract.** The longstanding assumption that partnerships between capital owners (locally known as *punggawa*) and shrimp trammel net fishermen are detrimental has been challenged by this study. The research aimed to analyze the financial and social benefits of such partnerships. The study was conducted in Babulu Laut village, North Penajam Paser Regency, East Kalimantan, where shrimp fishermen actively engaged in partnerships with capital owners and consented to a comprehensive investigation. This study collected primary data and supporting information from fishermen, capital owners, and relevant stakeholders. Financial data were analyzed using discounted and non-discounted investment criteria, while social data were processed qualitatively and presented narratively. The financial analysis revealed the following results: net present value (NPV) = IDR 433,810,821 (NPV > 0; indicating profitability), internal rate of return (IRR) = 365% (IRR > discount rate; indicating profitability), net benefit-to-cost (B/C) ratio = 13.11 (B/C ratio > 1; indicating profitability), and payback period = 0.50 years (6 months). These findings demonstrate that the partnership between capital owners and fishermen is financially sustainable. In addition to financial benefits, fishermen gain social advantages, such as humanitarian aid during disasters and household celebrations. Annual partnership contributions, such as Eid gifts, further enhance social and economic well-being. Moreover, the partnership provides fishermen with economic security by ensuring a consistent market for their catch.

**Key Words:** client, financial, fishermen, patron, trammel net.

**Introduction.** As defined by Indonesia's Law No. 45/2009, fisheries in Indonesia encompass the management and utilization of fishery resources. The Indonesian fisheries sector is broadly divided into three primary categories: aquaculture fisheries (which involves the cultivation and maintenance of aquatic organisms), fisheries processing (focused on the processing of fishery products), and capture fisheries (primarily carried out by fishermen). Capture fisheries are prevalent across nearly all provinces in Indonesia, with notable regions such as Pangandaran in West Java (Suryana et al 2022). Another key region outside Java Island is East Kalimantan Province, renowned for its significant capture fisheries activities. East Kalimantan spans a land area of 127,267.52 km<sup>2</sup> and a marine management area of 25,656 km<sup>2</sup> (Subagiyo 2020), making it a major player in Indonesia's fisheries sector. Fishing activities in East Kalimantan are concentrated in the southern region, particularly in North Penajam Paser Regency. This regency covers a total area of 3,333.06 km<sup>2</sup>, comprising 3,060.82 km<sup>2</sup> of land and 272.24 km<sup>2</sup> of sea. The fisheries potential in North Penajam Paser Regency is considerable, with production reaching 4,552.40 tons in 2016-2017 (Central Statistics Agency of East Kalimantan 2017). The region's coastal location, especially in the coastal area of Babulu Laut village, has contributed to the flourishing of capture fisheries activities.

Babulu Laut - the focus of this research - covers an area of 129.99 km<sup>2</sup>. Due to its geographical location, fishing is the primary livelihood for the majority of its residents (Central Statistics Agency of North Penajam Paser 2017). Babulu Laut's fishermen utilize various fishing gear depending on their specific catch objectives. One of the most commonly used gears, mainly for shrimp fishing, is the trammel net, locally known as "*jatilap*" (an abbreviation of *jaring tiga lapis*; the Indonesian term for the three-layered or

trammel net) (Dwirastina2016). Two images are provided for illustration: the first (Figure 1) is a documentation photo taken in the research area, and the second (Figure 2) depicts shrimp catches using a trammel net.



Figure 1. Trammel net (source: primary data, 2020).



Figure 2. Shrimp caught using a trammel net (source: <https://www.google.com/search/Three-layered-shrimp-net>).

The trammel net is a vertical, bottom-set fishing gear with three layers. The two outer layers feature larger mesh sizes than the inner layer, which is finer and slightly loosely spaced (He et al 2021). This design allows the inner mesh to trap fish more effectively while allowing smaller organisms to pass through.

Widely used by the residents of Babulu Laut, the trammel net is considered an environmentally sustainable alternative to more harmful fishing gear, such as trawl nets, purse seines, and drag nets (Indonesia's Minister of Maritime Affairs and Fisheries Regulation No. 2/2015). This shift in fishing practice is driven by concerns over the environmental impact of trawl nets, which are perceived as potentially damaging to marine ecosystems.

Fishermen using trammel nets in Babulu Laut target white shrimp (*Fenneropenaeus merguensis*) and tiger shrimp (*Penaeus monodon*) (Saain 1984). Figures 3 and 4



illustrate these species taken in the research area. Additionally, Jamal (2015) notes that in Takalar Regency, South Sulawesi, fishermen employing the same type of gear capture another variant of white shrimp, known as *jerbung* shrimp (*Penaeus merguensis*), as shown in Figure 5.



Figure 3. White shrimp (*Fenneropenaeus merguensis*) (source: primary data, 2020).



Figure 4. Tiger shrimp (*Penaeus monodon*) (source: primary data, 2020).



Figure 5. *Jerbung* shrimp (*Penaeus merguensis*) (source: <https://www.google.com/search?q=penaeus+merguensis>).

Coastal fishing activities in Babulu Laut have a longstanding history and operate within a partnership system, which is essential to the local socio-economic structure. To sustain their livelihoods, fishermen in the area have formed strong social ties through patron-client relationships, this "social struggle" may provide mutual support and assistance (Haryanto

2017; Bavinck et al 2018; González-Mon et al 2019; Dashfordate & Winoto 2023). In this system, fishermen establish partnerships with capital owners, locally known as “*punggawa*”. Kusumawati et al (2013) described artisanal trade networks controlled by local patrons, where patronage plays a pivotal role in regulating the activities of fishermen. Capital owners act as benefactors or “foster parents”, addressing the needs of fishermen during their fishing operations and ensuring their families’ well-being in the fishermen’s absence. Moreover, capital owners typically offer social assistance during times of hardship, such as illnesses affecting fishermen or their family members, financial aid for children’s education, and emergency funds in critical situations. The partnership model practiced in Babulu Laut stipulates that all catches from the fishermen (foster fishermen) must be sold to the capital owners, who act as the “foster parents”. The capital owners solely determine these catches’ prices (primary data, 2020). Based on the data and information gathered during the study, it is clear that fishermen do not challenge this partnership structure, despite the researchers’ calculations indicating a roughly 30% price discrepancy if fishermen market the catch independently. Given this context, an analysis of the financial viability of shrimp fishing using trammel nets under this partnership model is crucial to assess whether it is profitable. This analysis is critical as no prior data or information regarding the financial aspects of such partnerships were available at the time of the research. The primary objective of this study is to conduct a comprehensive financial analysis to evaluate the benefits derived from the partnership between fishermen and capital owners.

## Material and Method

**Time and location.** The researchers conducted this study from April to December 2020 in the shrimp net fishing community of Babulu Laut village, North Penajam Paser Regency, East Kalimantan, Indonesia. The study area is located between 00°48'29"-01°36'37" S and 116°19'30"-116°56'35" E (Figure 6).

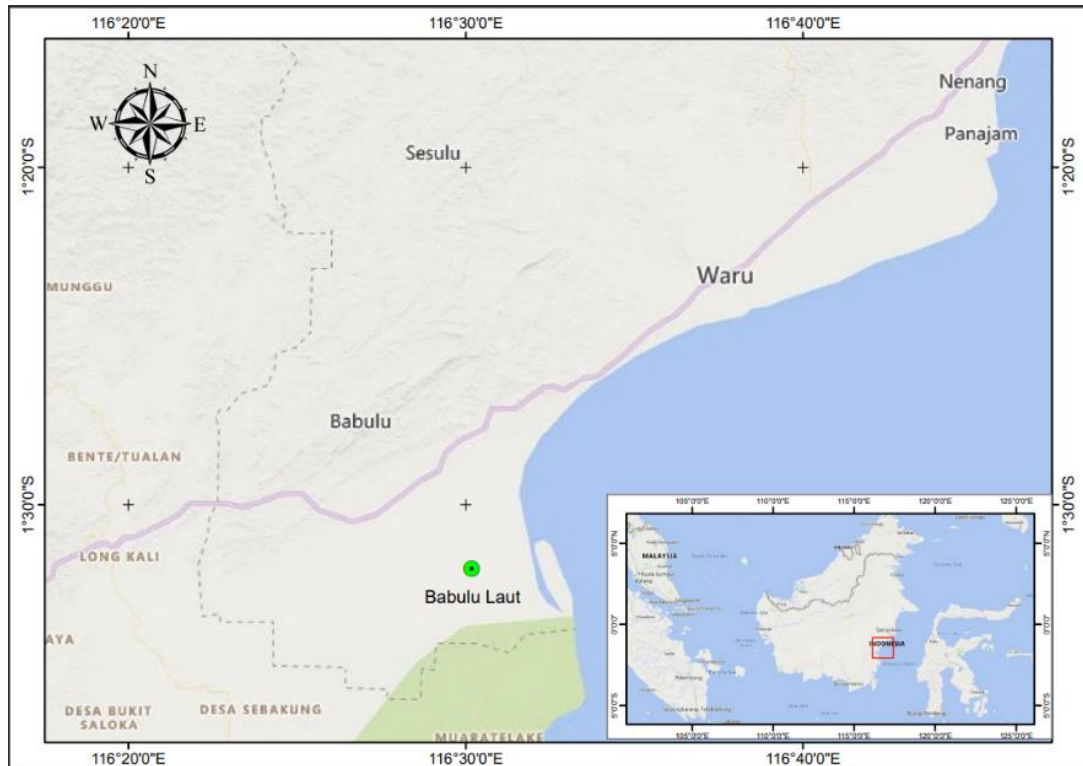


Figure 6. The map of Babulu Laut village.

**Sampling method.** Primary data were collected directly from fishermen at the research site through direct observation and interviews, using a structured questionnaire aligned

with the research objectives. Supporting data were gathered from relevant sources via a literature review. The respondents of this study were active fishermen engaged in shrimp fishing using the three-layered net (trammel net) in partnership with capital owners, locally known as *punggawa*. In this study, 13 fishermen were purposively selected (purposive sampling) and included as respondents through a census method (Sugiyono 2019).

**Data analysis.** The analysis employed discounted and non-discounted investment criteria to assess the financial viability of shrimp fishermen using trammel nets in partnership with capital owners. The discounted criteria included net present value (NPV), net benefit-to-cost ratio (B/C ratio), and internal rate of return (IRR), while the non-discounted criterion used was the payback period (PP). The formulas for these criteria are outlined below (Kadariah et al 1999; Helminuddin et al 2020a, b):

*Net present value (NPV).* NPV represents the difference between the present value of benefits and costs over a specified period. The formula is as follows:

$$NPV = \sum_{t=1}^n \frac{B_t - C_t}{(1 + i)^t}$$

where:  $B_t$  = benefits in year  $t$  (in IDR);  
 $C_t$  = costs in year  $t$  (in IDR);  
 $i$  = interest rate (in %);  
 $t$  = period or year  $t$ ;  
 $n$  = project lifespan (in years).

*Internal rate of return (IRR).* The IRR represents the rate of return on the net investment in a project, assuming that every positive net gain (i.e., where  $B_t - C_t$  is positive) is reinvested in the following year, earning the same rate of return ( $i$ ) (subjected to interest over the remaining project lifespan). The IRR can be calculated using the following formula:

$$IRR = i_1 + \frac{NPV_1}{NPV_1 - NPV_2} (i_2 - i_1)$$

where:  $NPV_1$  = net present value with a positive value (in IDR);  
 $NPV_2$  = net present value with a negative value (in IDR);  
 $i_1$  = discount rate that results in a positive NPV (in %);  
 $i_2$  = discount rate that results in a negative NPV (in %).

*Net benefit-cost ratio (net B/C ratio).* The net B/C ratio is a metric that compares the total present value of net benefits during years with positive net benefits (used as the numerator) against the total present value of net costs during years when the difference between benefits and costs ( $B_t - C_t$ ) is negative (indicating that gross costs exceed gross benefits, used as the denominator). The net B/C ratio is calculated as follows:

$$\text{Net B/C Ratio} = \frac{\sum_{t=1}^n \frac{B_t - C_t}{(1 + i)^t}}{\sum_{t=1}^n \frac{C_t - B_t}{(1 + i)^t}}$$

where:  $B_t$  = benefits in year  $t$  (in IDR);  
 $C_t$  = costs in year  $t$  (in IDR);  
 $i$  = applicable discount rate (in %);  
 $t$  = year  $t$ ;  
 $n$  = project lifespan (in years).

*Payback period (PP).* Kadariah (2001) and Kasmir & Jakfar (2003) define the PP as a financial measure used to determine the time required to recover the initial investment in a project or business. It indicates the duration needed for an investment to generate sufficient net cash inflows to cover its initial expenditure. The formula for calculating the payback period is as follows:

$$PP = \frac{\text{Investment Value}}{\text{Net Cash Inflow}} \times 1 \text{ year}$$

Criteria for payback period (for a 5-year business lifespan):

- if the PP value is less than 3 years, the investment is considered to provide a quick return;
- if the PP value is between 3 to 5 years, the investment is considered to provide a moderate return;
- if the PP value exceeds 5 years, the investment is considered to give a slow return.

## Results

**Description of the research location.** Babulu Laut - situated in North Penajam Paser Regency, East Kalimantan - was selected as the research site due to its alignment with the criteria for a representative sample area. Fishermen in this region harvest shrimp using three-layered shrimp nets (trammel nets) and operate under collaborative partnerships with capital owners, locally referred to as *punggawa* (Government of Babulu Laut, 2020).

**Characteristics of respondents.** The respondents' ages range from 22 to 65 years, with the majority having completed elementary education. The dominant ethnic group in the area is the Buginese. The fishing enterprises have been operational for 10 to 20 years, with fishing zones located approximately 15 kilometers from the coastline. On average, fishing activities are conducted around 26 times per month.

### Cost types, catch results, revenue, and income

*Investment costs.* Table 1 details the investment costs of shrimp trammel net fishing businesses in Babulu Laut.

Table 1

Investment costs

No.	Items	Type	Quantity	Price (IDR)	Useful life (years)	Total cost (IDR)
1	Boat	Unit	1	7,953,571	5	7,953,571
2	Diesel engine (24 HP)	Unit	1	5,478,571	8	5,478,571
3	Icebox	Unit	1	131,250	3	131,250
4	Trammel net	Set	104	214,162	1	22,272,857
Total						35,836,250

Source: primary data (2020).

*Operational and maintenance costs.* Table 2 details the operational and maintenance costs associated with the shrimp trammel net fishing businesses in Babulu Laut.

Table 2

Operational and maintenance costs

No.	Items	Type	Quantity	Price (IDR)	Total cost (IDR/trip)	Total cost (IDR/month)	Total cost (IDR/year)
<i>Variable costs</i>							
1	Fuel	Liter	6.5	8,500	52,821	1,373,357	16,480,286
2	Consumption	Day	1	20,000	20,000	520,000	6,240,000
Subtotal variable costs						1,893,357	22,720,286
<i>Fixed costs</i>							
1	Engine maintenance (oil change, quarterly)	Liter	4	19,714	77,571		310,284

2	Boat maintenance (paint)	Can	3	62,964	168,964	217,714	
3	Boat maintenance (thinner)	Can	3	33,333	80,179	109,815	
4	Replacement of propeller spare parts	Unit	1	210,000	210,000		
5	Replacement of equipment (1-year lifespan)	Unit	104	214,162	22,272,857	22,272,857	
6	Replacement of equipment (3-year lifespan)	Unit	1	131,250	131,250		
Subtotal fixed costs						22,910,672	
Total						1,893,357	45,630,958

Source: primary data (2020).

*Depreciation costs.* Table 3 summarizes the annual depreciation costs for the shrimp trammel net fishing operations in Babulu Laut.

Table 3

Depreciation costs

No.	Items	Type	Quantity	Price (IDR)	Useful life (years)	Total cost (IDR)	Depreciation (IDR year <sup>-1</sup> )
1	Boat	Unit	1	7,953,571	6	7,953,571	1,937,717
2	Diesel engine (24 HP)	Unit	1	5,478,571	8	5,478,571	1,109,361
3	Icebox	Unit	1	131,250	3	131,250	52,701
4	Trammel net	Set	104	214,162	1	22,272,857	23,831,957
Total						35,836,250	26,931,736

Source: primary data (2020).

*Catch results.* Table 4 details the catch results for the shrimp trammel net fishing business, classified by species.

Table 4

Catch results

Year	Production volume (kg year <sup>-1</sup> )	
	White shrimp	Tiger shrimp
1	2,623	135
2	2,623	135
3	2,623	135
4	2,623	135
5	2,623	135

Source: primary data (2020).

*Revenue.* Table 5 details the revenue generated from the shrimp trammel net fishing business in Babulu Laut.

Table 5

## Sales revenue

Year	Sales revenue (IDR year <sup>-1</sup> )
1	147,721,786
2	147,721,786
3	147,721,786
4	147,721,786
5	147,721,786

Source: primary data (2020).

*Income.* The annual income from shrimp trammel net fishing in Babulu Laut is estimated at IDR 102,442,629.

**Financial analysis.** The financial analysis aimed to evaluate the sustainability and economic viability of the shrimp trammel net fishing business in Babulu Laut. This assessment utilized discounted investment criteria - NPV, IRR, and net B/C ratio - and non-discounted investment criteria, such as the PP. The analysis assumes a self-financing model (no credit dependency) with an annual interest rate of 12% based on BRI BritAma savings. All costs and benefits are treated as constant throughout the project lifespan. Table 6 presents the calculation results using these financial criteria.

Table 6

## Results of financial analysis for shrimp trammel net fishing business

Funding pattern	NPV (IDR)	IRR (%)	Net B/C ratio	Payback period (years)	Viability justification
Self-financing	433,810,821	365	13.11	0.50	Viable (go project)

Source: primary data (2020).

*Net present value (NPV).* The NPV of the shrimp trammel net fishing business in Babulu Laut is IDR 433,810,821, indicating the business's economic viability for continued operation (go project). This finding aligns with the criteria outlined by Kadariah et al (1999) and Helminuddin et al (2020a), which state that a business is considered viable if its NPV exceeds zero (NPV > 0). Furthermore, Ningsih et al (2013) emphasizes that a higher NPV reflects superior business performance, suggesting that this venture demonstrates strong financial potential and sustainability.

*Internal rate of return (IRR).* The IRR for the shrimp trammel net fishing business is 365%, far exceeding the annual interest rate of 12% used as the discount rate (BRI BritAma savings rate). This significant margin confirms the business's profitability and justifies its viability for continued operation (go project). These findings are consistent with the principles set forth by Kadariah et al (1999), Yafiz et al (2009), and Helminuddin et al (2020a, b), which state that a business is deemed profitable and sustainable if its IRR surpasses the interest rate (IRR > i).

*Net benefit-cost ratio (net B/C ratio).* The net B/C ratio for the shrimp trammel net fishing business in Babulu Laut is 13.11, indicating that the generated benefits are 13.11 times higher than the costs incurred. A net B/C ratio greater than 1 (net B/C ratio > 1) demonstrates the business's economic viability and profitability. This result supports the assertions of Kadariah et al (1999) and Helminuddin et al (2020a, b), who emphasize that a net B/C ratio exceeding 1 confirms the feasibility of a project due to its significant financial returns.

*Payback period (PP).* The PP for the shrimp trammel net fishing business is 0.50 years or 6 months, reflecting the time required to recover the initial investment. This short PP, considerably less than the project's 5-year lifespan, highlights the business's quick return



on investment and economic sustainability. According to Kasmir & Jafkar (2003), a PP shorter than the project lifespan strongly indicates a viable and profitable business. Therefore, this shrimp trammel net fishing operation is deemed feasible for continued investment and operation (go project).

**Discussion.** A significant challenge for shrimp trammel net fishermen in the study area is insufficient capital for initiating or expanding their fishing operations. To address this, many fishermen collaborate with local capital owners or funding sources, referred to as *punggawa*, which function as non-governmental financial institutions. This preference for *punggawa* over formal banking institutions stems from several advantages: minimal requirements, expedited processes, straightforward procedures, and the convenience of receiving loans directly at their homes. In a large archipelagic state like Indonesia, many such communities are located a considerable distance from and possess difficult access to major population centres, resulting in local economies that are dependent on very narrow import and export streams and are thus highly vulnerable to the vagaries of external supply and demand (Nurdin & Grydehøj 2014). The fisheries sector in this region often operates within a patron-client system. In this structure, patrons (such as the *punggawa*) act as intermediaries connecting small-scale fishermen (clients) to larger national and international markets (Miñarro et al 2016). In these systems, patrons provide essential financial support and access to fishing resources, but the arrangements often lack formal regulation (Ferrol-Schulte et al 2014). Such systems are particularly prevalent in coastal communities where small-scale fishing is a critical livelihood. Partnerships with *punggawa* not only provide financial support but also facilitate access to various forms of assistance. The patron-client relationship in fisheries is a tradition and social strategy adopted by fishers to reduce the cost of transportation to the first point of purchase of their products (Basurto et al 2013). However, this relationship comes with significant trade-offs. Fishermen are typically required to sell their entire catch exclusively to the *punggawa*, who determine the purchase price unilaterally. This price is notably lower (approximately 30% less) than what could be earned by selling to other buyers. This pricing dynamic reflects the asymmetrical benefits of the patron-client relationship, where patrons enjoy more significant revenue, enhanced bargaining power, and operational flexibility (Roberts et al 2022).

The financial analysis of the shrimp trammel net fishing business, evaluated using both discounted and non-discounted investment criteria, demonstrates the following outcomes: (1) The NPV is calculated at IDR 433,810,821, indicating that the total net profit at the end of the business operation equals the NPV. Since the  $NPV > 0$ , it confirms the business's viability and profitability, making it a feasible investment for the fishermen. (2) The IRR is determined to be 365%, far exceeding the annual discount rate of 12% ( $IRR > i$ ). The value indicates that the business can yield an exceptionally high return, further establishing its viability and profitability. In practical terms, if a fisherman invests IDR 1,000,000, they can expect a return of IDR 3,650,000 per year instead of depositing the same amount in a bank, which would yield only IDR 1,200,000 per year at the current interest rate. (3) The calculated net B/C ratio is 13.11, signifying that the benefits derived by shrimp trammel net fishermen are 13.11 times higher than the costs incurred (net B/C  $> 1$ ). This highlights the business's viability and profitability. For instance, if shrimp trammel net fishermen invest IDR 1,000,000, they can expect a return of IDR 13,110,000. (4) The PP is calculated at 0.50 years, or approximately six months, demonstrating that the shrimp trammel net fishing business can recover its investment costs in an exceptionally short period. The results of these calculations - each surpassing the established benchmarks - reinforce the economic viability of the shrimp trammel net fishing business in Babulu Laut. Based on Helminuddin et al's (2020a, b) perspectives, the partnership model between shrimp trammel net fishermen and local capital owners (*punggawa*) is economically sustainable and profitable. Our findings revealed that the relationship between lenders and fishermen is not inherently detrimental to the fishermen. On the contrary, fishermen can still generate profits from their business operations and repay loans provided by financiers. This partnership model also brings significant social and economic benefits to the fishermen. From a social perspective, fishermen receive

humanitarian and social support during personal calamities or household celebrations. Additionally, they are eligible for an annual partnership allowance through gifts. From an economic perspective, this partnership ensures market certainty for the fishermen's catches. This mutual relationship aligns with the observations of O'Niells et al (2019), who noted that lenders often provide financial assistance to fishermen to help them recover from economic hardships, particularly those caused by natural disasters. Despite the risk of delayed or non-repayment, as long as the fishermen's commodity supply remains intact, both parties can survive. However, Hendrik et al (2024) emphasize the patron-client relationships (PCRs), exploring social and economic dimensions. Socially, these relationships include assistance in times of need and adherence to social norms. Economically, they manifest as loans and price-setting mechanisms for fish. The authors note that PCRs are inherently asymmetrical, with responsibilities and risks shifting over time. Historically, patrons bore the brunt of these responsibilities, but today, the clients - mainly fishermen - assume most of the financial burden and associated risks. This evolving relationship pattern has significant implications for policy formulation, particularly in fisheries development and coastal community support. Understanding the dynamics of these shifts is crucial for designing effective development interventions that address the needs and challenges faced by fishing communities.

**Conclusions.** A notable insight derived from this study pertains to the rationale behind the willingness of shrimp trammel net fishermen in Babulu Laut, who collaborate with the capital owners (*punggawa*), to acquiesce to the unilateral pricing decisions made by the capital owners. This agreement persists, notwithstanding an approximate  $\pm 30\%$  price differential when shrimp is traded in an open market. The reasons for this are as follows: (1) shrimp trammel net fishermen experience a sense of assurance in marketing their catch (2) the capital owners (*punggawa*) demonstrate a willingness to accept the shrimp catch from the fishermen, even in smaller quantities; (3) in practical terms, fishermen find comfort in collaborating with the capital owners as it helps mitigate negative business risks; (4) financial analysis - even with a reduced standard price of  $\pm 30\%$  - still deems the results viable (profitable), particularly when factoring in the full price (100%).

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## References

- Basurto X., Bennett A., Weaver A. H., Van Dyck S. R., Aceves-Bueno J. S., 2013 Cooperative and noncooperative strategies for small-scale fisheries' self-governance in the globalization era: implications for conservation. *Ecology and Society* 18(4):38.
- Bavinck M., Jentoft S., Scholtens J., 2018 Fisheries as social struggle: a reinvigorated social science research agenda. *Marine Policy* 94:46-52.
- Central Statistics Agency of East Kalimantan Province, 2017 [East Kalimantan in numbers]. BPS, East Kalimantan Province. [in Indonesian]
- Dashfordate A., Winoto D. E., 2023 Patron-client role in Duan-lolat tradition in the Latdalam fisherman community. *International Journal of Social Science Research and Review* 6(3):480-490.
- Dwirastina M., 2016 [Construction and yield of trammel nets operating in the Musi River estuary of South Sumatra]. *Buletin Teknik Litkayasa Sumber Daya dan Penangkapan* 12(1):19-22. [in Indonesian]
- Ferrol-Schulte D., Ferse S. C. A., Glaser M., 2014 Patron-client relationships, livelihoods and natural resource management in tropical coastal communities. *Ocean and Coastal Management* 100:63-73.

- González-Mon B., Bodin Ö., Crona B., Nenadovic M., Basurto X., 2019 Small-scale fish buyers' trade networks reveal diverse actor types and differential adaptive capacities. *Ecological Economics* 164:106338.
- Government of Babulu Laut, 2020 [Babulu Laut village profile]. [in Indonesian]
- Haryanto, 2017 Adaptation and continuities in clientelism in a fishing community in Takalar, South Sulawesi. *Contemporary Southeast Asia* 39(3):511-531.
- He P., Chopin F., Suuronen P., Ferro R. S. T., Lansley J., 2021 Classification and illustrated definition of fishing gears. *FAO Fisheries and Aquaculture Technical Paper No. 672*, FAO, Rome, 94 pp.
- Helminuddin, Purnamasari E., Abdusysyahid S., 2020a A marketing and financial analysis of milkfish (*Chanos chanos*) and giant tiger prawn (*Penaeus monodon*) farming in East Kalimantan. *International Journal of Innovation, Creativity and Change* 11(4):581- 591.
- Helminuddin, Abdusysyahid S., Saleha Q., 2020b A financial analysis on gillnet fishery business in Sangatta District, East Regency, East Kalimantan, Indonesia. *International Journal of Innovation Creativity and Change* 11(4):450-462.
- Hendrik H., Effendi I., Zulkarnaini Z., Yolandika C., Mahary A., Effendi I., 2024 Patron-client relationships in capture fisheries business: a policy challenge. *Journal of Infrastructure, Policy and Development* 8(8):4675.
- Jamal M., 2015 [Trammel net selectivity for penaeid shrimps in Takalar Regency waters, South Sulawesi Province]. *Torani, Jurnal Ilmu Kelautan dan Perikanan* 25(2):96-105. [in Indonesian]
- Kadariah, 2001 [Project evaluation: financial analysis]. The Publishing House of FE-UI, Jakarta, 110 pp. [in Indonesian]
- Kadariah, Karlina L., Gray C., 1999 [Introduction of project evaluation]. The Publishing House of FE-UI, Jakarta, 104 pp. [in Indonesian]
- Kasmir, Jakfar, 2003 [The feasibility study for business]. *Predana Media Group*, Jakarta, 262 pp. [in Indonesian]
- Kusumawati R., Bush S. R., Visser L. E., 2013 Can patrons be bypassed? Frictions between local and global regulatory networks over shrimp aquaculture in East Kalimantan. *Society and Natural Resources* 26(8):898-911.
- Law of the Republic of Indonesia No. 45 of 2009 amending Law no. 31 of 2004 concerning Fisheries. [in Indonesian]
- Miñarro S., Forero G. N., Reuter H., van Putten I. E., 2016 The role of patron-client relations on the fishing behavior of artisanal fishermen in the Spermonde Archipelago (Indonesia). *Marine Policy* 69:73-83.
- Ningsih R. S., Mudzakir A. K., Rosyid A., 2013 [Analysis of financial feasibility of Payang jabur fishing effort (boat seine) at the Asemdayong Coastal Fishing Port in Pematang District]. *Journal of Fisheries Resources Utilization Management and Technology* 2(3):223-232. [in Indonesian]
- Nurdin N., Grydehøj A., 2014 Informal governance through patron-client relationships and destructive fishing in Spermonde Archipelago, Indonesia. *Journal of Marine and Island Cultures* 3(2):54-59.
- O'Neill E. D., Crona B., Ferrer A. J. G., Pomeroy R., 2019 From typhoons to traders: the role of patron-client relations in mediating fishery responses to natural disasters. *Environmental Research Letters* 14(4):045015.
- Regulation of the Minister of Maritime Affairs and Fisheries No. 2/PERMEN-KP/2015 of 2015 on the Prohibition of the Use of Trawls and Seine Nets in the Fisheries Management Area of the Republic of Indonesia. [in Indonesian]
- Roberts N., Mengge B., Utina M. R., Muhatar F., Anugerah, Iwardanhi A., Zulkifli R. M., Humphries A., 2022 Patron-client relationships shape value chains in an Indonesian island-based fisheries system. *Marine Policy* 143:105142.
- Saanin H., 1984 [Taxonomy and identification keys for fish]. *Bina Cipta*, Jakarta, 200 pp. [in Indonesian]
- Subagiyo L., 2020 [The potential of coastal areas of Paser Regency, Penajam Paser Utara and Balikpapan, East Kalimantan Province]. *Media Nusa Creative (MNC Publishing)*. [in Indonesian]

- Sugiyono, 2019 [Quantitative, qualitative methods and research design]. Alfabeta, Bandung, 334 pp. [in Indonesian]
- Suryana A. A. H., Saefurahmat A., Mulyani Y., Nurhayati A., 2022 Analysis of the exchange rate of small-scale trammel net fishermen in Pangandaran District, Pangandaran Regency. *Asian Journal of Fisheries and Aquatic Research* 20(3):21-31.
- Yafiz M., Sondita M. F. A., Soemakaryo S., Daniel R., 2009 [Financial analysis of fishing business in the model of improving the welfare of fishermen in Rokan Hilir Regency, Riau Province]. *Jurnal Perikanan dan Kelautan* 14(1):295973. [in Indonesian]
- \*\*\* <https://www.google.com/search?q=penaeus+merguiensis>. Accessed: November, 2021.
- \*\*\* <https://www.google.com/search/Three-layered-shrimp-net>. Accessed: November, 2021.

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