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Analysis of Feasibility of the Barred Loach (Nemacheilus fasciatus) Fishing Activity in the Karang River, Purbalingga Regency

Hajarani NadiyaIslam*
Capture Fisheries Department,
Faculty of Fisheries and Marine Science, Diponegoro University, Indonesia
hajaraninadiya@students.undip.ac.id
https://ror.org/056bjta22
Trisnani Dwi Hapsari
Capture Fisheries Department
Faculty of Fisheries and Marine Science, Diponegoro University, Indonesia
trisnanidwihapsari@lecturer.undip.ac.id
https://orcid.org/0000-0003-2207-6930
https://ror.org/056bjta22
Aristi Dian Purnama Fitri
Capture Fisheries Department
Faculty of Fisheries and Marine Science, Diponegoro University, Indonesia
aristidian@lecturer.undip.ac.id
https://orcid.org/0000-0002-4006-2391
https://ror.org/056bjta22

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Abstract: The Barred Loach (Nemacheilus fasciatus) is a high-value fish for the local community. This study aims to analyze the technical and financial aspects of Barred Loach fishing using telik and wuwu traps. The research was conducted at the Karang River located in Pepedan Village, Purbalingga Regency, using data collection methods in the form of interviews, observation, documentation, and literature review, quantitative descriptive technical analysis methods supported by qualitative analysis, and financial aspect analysis methods using Break Even Point (BEP), Revenue Cost Ratio (R/C Ratio), Return on Investment (ROI), and Payback Period (PP) calculations. The analysis of business feasibility results indicated that fishing Barred Loach with telik and wuwu traps is viable. The BEP values for the price and production with the telik fishing gear are Rp10,598 and 14.4 kg, respectively; the R/C ratio is 9.4, ROI is 13.65(1365%), and the payback period (PP) is 9.0days (return on investment in 9days). The BEP values for the price and production with the wuwu fishing gear are Rp6, 201 and 4.9 kg, respectively; the R/C ratio is16.1,ROI is 18.14 (1814%), and the payback period (PP) is 6.8 days (return on investment in 6,8 or 7 days).
Keywords: Business Feasibility, Technical, Telik, Barred Loach, Wuwu

I. INTRODUCTION

Indonesia possesses abundant fishery resources that are distributed not only in marine ecosystems but also in inland waters, including rivers, lakes, swamps, and other freshwater environments. Among the numerous fish species traded in local market, several possess relatively high economic value for surrounding communities. One such species is the Barred Loach (Nemacheilus fasciatus), which is commonly found on the islands of Sumatra and Java [33]. In Java, the species is distributed in the waters of Banyumas, Purbalingga, Temanggung, and neighboring regions. The Barred Loach is a small fresh water fish characterized by an elongated cylindrical body and a series of circular markings along its lateral sides. This species is highly appreciated by consumers because of its distinctive savory and slightly sweet flavor without leaving a bitter after taste. Furthermore, Barred Loach contains beneficial unsaturated fatty acids, including omega-3 and omega-6, as well as eicosapentaenoic acid (EPA) and docosahexaenoic acids (DHA), which contribute to human health and support physical and cognitive development [5]. Currently, the market price of fresh Barred Loach can reach IDR 100,000 kg^{-1}, while processed products are sold at approximately IDR 350,000–400,000 kg^{-1}. At present, the majority of Barred Loach production remains dependent on capture fisheries.

In the Karang River, Purbalingga Regency, Central Java Province, fishers commonly employ traditional bamboo traps locally known as telik and wuwu. These fishing gears are categorized as environmentally friendly because they operate passively, capture fish a live without exposing them to harmful substances, minimize damage to aquatic habitats, and exhibit relatively high selectivity toward target species. Their operating mechanism is considered effective because fish voluntarily enter the traps in response to bait attractants but are unable to escape due to the funnel-shaped entrance structure [9]. The Karang River supports Barred Loach populations throughout the year; however, fishing activities cannot be conducted continuously under all environmental conditions. One of the most favorable periods for harvesting Barred Loach occurs during the rainy season. During the present study, conducted from October 2025 to January 2026, environmental conditions coincided with the peak fishing season, thereby increasing the likelihood of obtaining substantial catches. The occurrence of Barred Loach in only certain freshwater ecosystems provides an opportunity for local governments to promote the species as a distinctive regional fishery commodity. Such recognition could enhance its culinary appeal, particularly among visitors from outside the region, while supporting the sustainable development of Barred Loach fisheries. From an economic perspective, Barred Loach fishing activities should generate sufficient added value for fishers to ensure the continuity of the enterprise. In addition, this fishery has the potential to create alternative employment opportunities and supplementary income sources for communities living along the Karang River, particularly casual laborers during the peak fishing season. Increased community participation in Barred Loach fishing activities may contribute to maintaining a balance between market demand and supply while simultaneously improving local livelihoods. Consequently, the fishery may serve as an important seasonal economic activity capable of generating additional household income. Despite its economic importance, studies examining the feasibility of Barred Loach fishing enterprises remain limited. In particular, there is a lack of research focusing on the use of telik and wuwu traps that are specifically operated in shallow and Rocky River in environments. Therefore, this study aims to examine the technical aspects of Barred Loach fishing using telik and wuwu traps in the Karang River, Purbalingga Regency; and evaluate the financial feasibility of Barred Loach fishing enterprises employing these fishing gears. The findings are expected to provide scientific information regarding the sustainability and economic potential of Barred Loach fisheries while supporting the development of community-based inland capture fisheries.

II. LITERATURE REVIEW

The Barred Loach (Nemacheilus fasciatus) in habits fresh water rivers characterized by moderately strong currents and substrates dominated by small rocks and gravel. This species is distributed across the islands of Sumatra and Java, where varying geographical conditions have contributed to morphological diversity among populations. One of the most noticeable variations is the number of saddle-shaped color patterns along the dorsal region and the number of spots or circular markings along the lateral line. Morphological differentiation among Barred Loach populations from different aquatic environments indicates a strong adaptive capacity to local habitat conditions. [52]. the productivity of trap fisheries may be influenced by several factors, including trap design, construction characteristics, and the type of bait used. Fish traps are categorized as passive fishing gears and are available in a wide range of shapes and sizes, including enclosed traps, collapsible traps, cylindrical traps, drum-shaped traps, semicircular traps, and other configurations. In general, trap construction consists of an entrance, a body chamber, and an exit or harvesting door. Trap gears are commonly operated in shallow waters targeting demersal or reef-associated fish species. To maximize catch efficiency, fishers must carefully consider trap placement, deployment timing, and bait selection during fishing operations. [24].

Low house hold income and limited access to decent employment opportunities remain common challenges in many developing countries. The socio economic conditions and human resource capacity of fishing communities in several regions require greater attention, particularly in areas where unemployment rates remain relatively high. Various forms of pressure may adversely affect fishers' livelihoods, including fluctuations in fish catch production. Economic systems within communities are interconnected, and changes in one component may influence other aspects of local socioeconomic conditions [28]. Fishing activities require investment capital, and business performance is strongly influenced by environmental conditions, fishing techniques, and the financial capacity of entrepreneurs. Therefore, decisions regarding the establishment and continuation of a fishing enterprise should be based on comprehensive financial considerations, including both investment and operational expenditures. Financial analysis is conducted to evaluate the benefits generated by a business and to determine whether the enterprise is economically feasible and profitable [14].Profit can be defined as the difference between total revenue and total costs incurred. Consequently, the success of a business is commonly measured by its profit margin and the rate of return achieved. Profit ability analysis generally involves the evaluation of production costs and revenue generation. The level of profit obtained from a business depends on the magnitude of production costs in cured and the revenue generated through product sales. Therefore, profitability assessment plays a crucial role in determining whether a business can achieve its desired economic objectives [7].

III. METHODS

A. Study Area and Research Period

This study was conducted from February to April 2026 in Pepedan Village, Karangmoncol District, Purbalingga Regency, and Central Java, Indonesia. The Karang River was selected as the study site because it is one of the inland water bodies where active fishers routinely conduct Barred Loach fishing operations during the peak fishing season. This condition facilitated detailed data collection regarding site characteristics, fishing techniques; catch production, and marketing activities. The location of the study area is presented in Figure 1.

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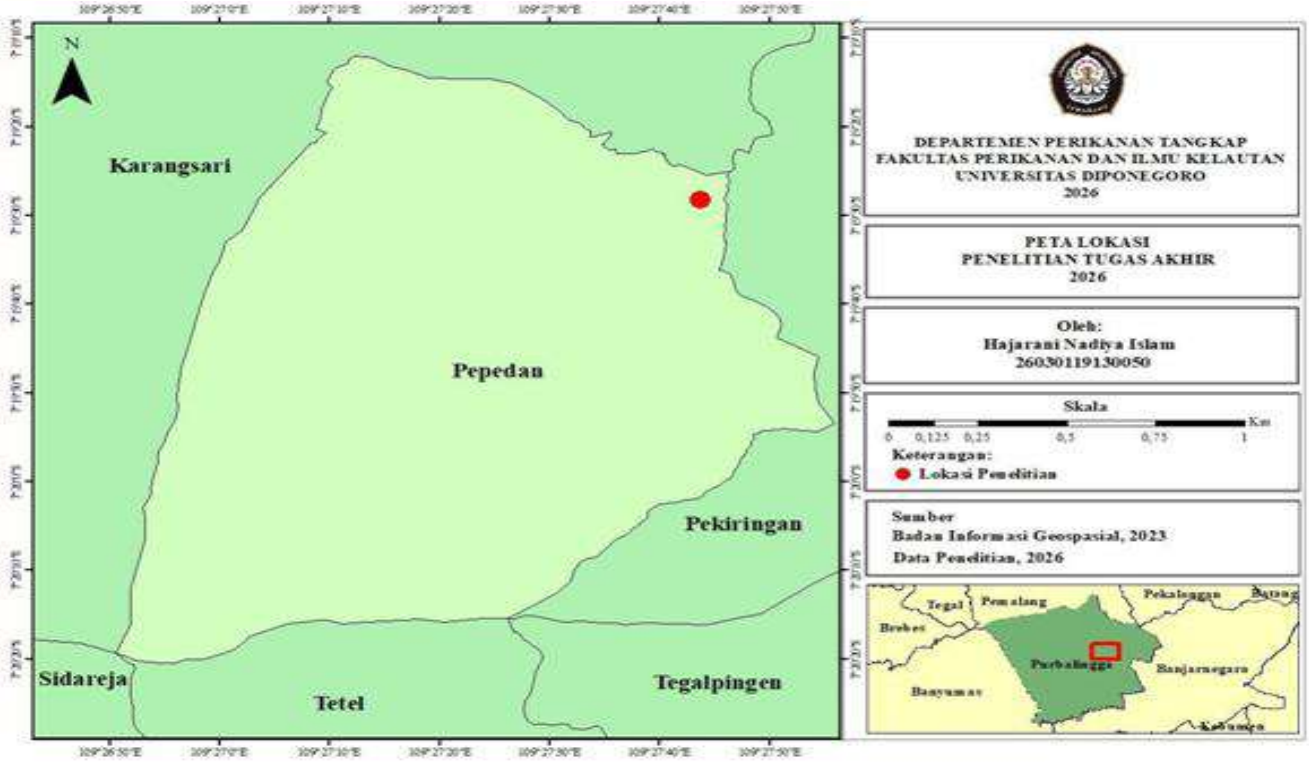

Fig 1 Data Collection Location

B. Data Collection and Sampling Methods

The focus of this study was the Barred Loach fishing enterprise (Nemacheilus fasciatus) in the Karang River using telikand wuwu trap gears. The observed variables included fishing gear design and construction, fishing operation techniques; catch composition and storage methods, as well as marketing practices. The collected data were subsequently processed and analyzed based on technical, financial, and business feasibility aspects. This research employed a quantitative descriptive approach supported by qualitative analysis. The method emphasizes detailed descriptions of events and phenomena through numerical calculations and economic-based data analysis. Data collection was conducted using four techniques: interviews, direct observation, literature review, and documentation. Sampling was carried out using a census approach. Data were collected from all active Barred Loach fishers who met the research criteria and were willing to participate as respondents. A total of two fishers were selected, each having at least two years of experience in Barred Loach fishing activities. The limited number of respondents reflected the relatively small and uneven population of Barred Loach fishers in the study area. Furthermore, Barred Loach fishing is generally considered a seasonal supplementary occupation rather than a primary source of income, resulting in a limited number of active and experienced fishers.

This study adopted a case-study approach focusing on an in-depth assessment of representative fishing enterprises. Within this framework, data richness and information quality were prioritized over sample size. The selected respondents fulfilled the criteria of key informants, possessing extensive practical experience, technical knowledge of fishing operations, and comprehensive understanding of financial aspects related to the fishing business. Therefore, the inclusion of two respondents was considered sufficient to provide an in-depth representation of the technical and financial conditions of Barred Loach fishing enterprises in the Karang River. The technical data collected included the construction of telik and wuwu traps, operational methods, and Barred Loach catch production. Financial data included the costs of fishing equipment and supporting tools, fish selling prices, and total sales revenue. Business feasibility calculations were conducted after obtaining primary data from interviews and calculating investment capital, total costs, revenues, and profits. The financial feasibility indicators used in this study included the Revenue-Cost Ratio (R/C Ratio) [36], Break Even Point (BEP) [7], Return on Investment (ROI) [47], dan Payback Period (PP) [47].

1) Break Even Point (BEP)

$$\text{BEP Production} = \frac{\text{Total Cost}}{\text{Fish Price}}$$

$$\text{BEP Price} = \frac{\text{Total Production}}{\text{Total Cost}}$$

2) Revenue Cost Ratio (R/C Ratio)

$$\text{R/C Ratio} = \frac{\text{Total Revenue}}{\text{Total Cost}}$$

With the criteria:

If the R/C value >1, then the business is profitable; If the R/C value =1, then the business neither makes a profit nor incurs a loss; If the R/C value < 1, then the business incurs a loss.

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3) Rate on Investment (ROI)

$$ROI = \frac{\text{Profit}}{\text{Investment Capital}} x100\%$$

4) Payback Period(PP)

$$PP = \frac{\text{Investment Capital x 1 Year}}{\text{Profit}}$$

IV. RESULT AND DISCUSSION

Result

A. Fishing Gear Construction, Fishing Operation Methods, and Catch Production

Both telik and wuwu traps exhibit similar structural characteristics, consisting of two openings, a funnel-shaped entrance (injab), a trap body, and a suspension rope. The body of each trap is constructed from a main frame (KU) and woven bamboo panels (AB). The first opening is equipped with a funnel-shaped entrance that serves as the entry pathway for Barred Loach. The trap body functions as a holding chamber for captured fish, while the second opening is fitted with a wood encoder that allows fishers to remove the catch. The suspension rope attached to the wuwu trap is used to hang the gear during maintenance activities, whereas the rope attached to the telik trap is used to connect multiple units, facilitating transportation to the fishing site.

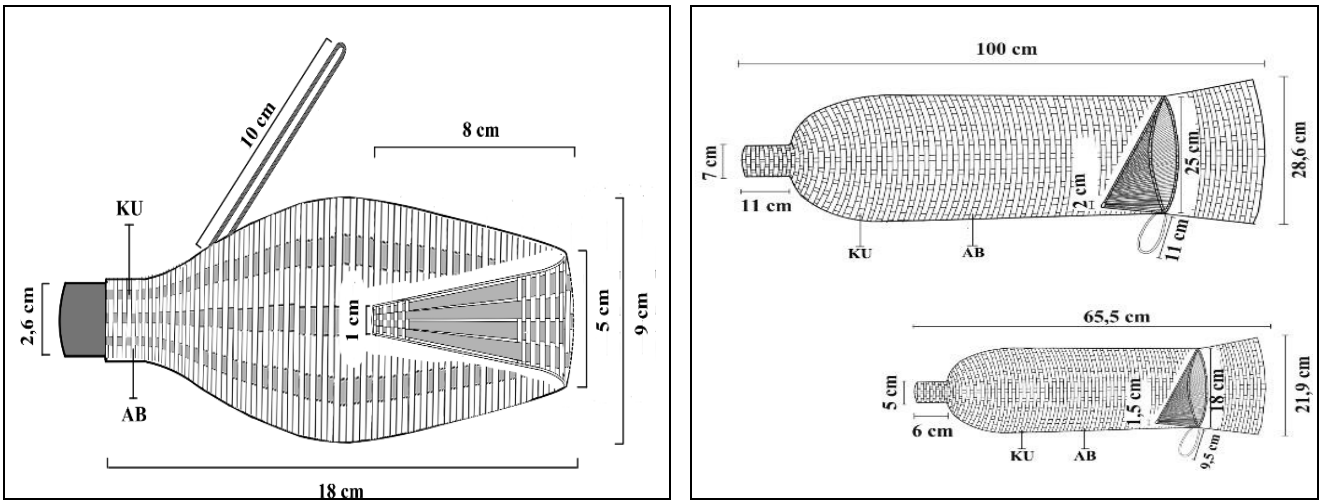

Fig 2. Contruction of Telik and WuwuTraps

Fishing operations using telik traps are typically conducted following heavy rainfall events that result in substantial flooding. Such conditions facilitate the transport of algae, the natural food source of Barred Loach, by river currents, thereby increasing the effectiveness of baited traps. Fishers must also monitor water clarity, as Barred Loach tend to aggregate in areas with clear water conditions. The number of fishing trips conducted per day depends on the catch obtained during the initial deployment. If catches are abundant during the first trip, fishers may conduct a second deployment on the same day. The fishing grounds used for both telik and wuwu operations were located within the same river section, between 7°19'47.33" S and 109°27'53.32" E and 7°19'50.925" S and 109°27'53.325" E. However, differences exist in water conditions, weather requirements, and operational timing. Teliktraps require clear and moderately flowing water and are generally deployed during the early morning. Fishing activities may continue even during light rainfall. In contrast, wuwu traps are less dependent on water clarity but require clear weather conditions during night time operations to ensure the effectiveness of the temporary dam system used during fishing. Rainfall can interfere with river water recession and reduce the likelihood of fish entering the traps.

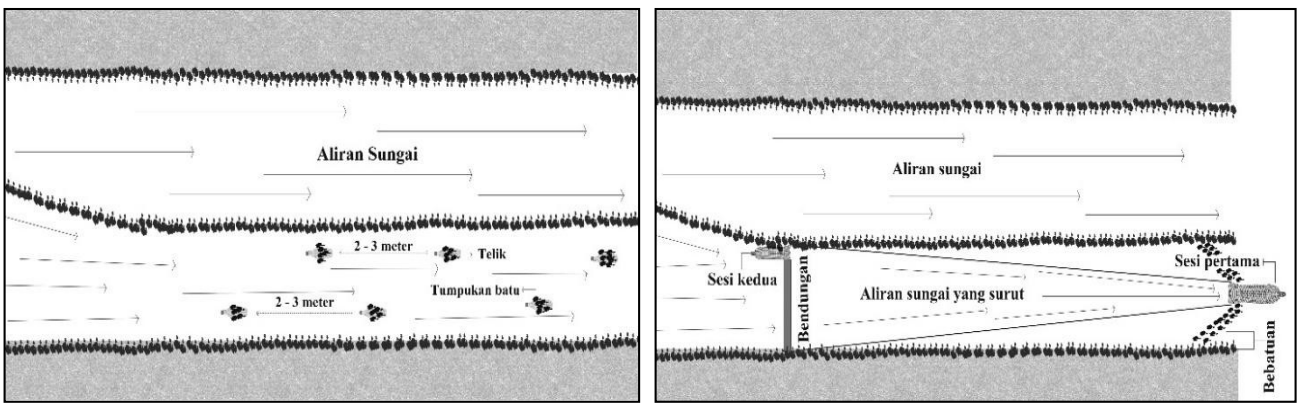

Fig 3. Operational Methods of Telik and WuwuTraps

The catch data collected during the study period a represented in Table I.

Table I. Barred Loach Catch Production during the Study Period

No	Month	Trips	Catch (kg)	Average per Trip (kg)	Main Catch
Telik Trap					
1.	October 2025	24	34	1,42	Barred Loach (*Nemacheilus fasciatus*)
2.	November 2025	25	36	1,44	
3.	December 2025	28	32	1,14	
4.	January 2026	27	34	1,26	
Total		104	136	1,3	
Wuwu Traps					
1.	October 2025	17	27,5	1,62	Barred Loach (*Nemacheilus fasciatus*)
2.	November 2025	15	24	1,60	
3.	December 2025	10	13	1,3	
4.	January 2026	12	15	1,25	
Total		54	79,5	1,47	

B. Financial Performance

Financial calculations were conducted to evaluate the economic viability of Barred Loach fishing enterprises. The analysis included investment costs, operational costs, revenues, and profits.

Table II. Financial Performance of Barred Loach Fishing Enterprises

No.	Fishing Gear	Investment Capital (IDR)	Variable Cost (IDR)	Total Cost (IDR)	Average Monthly Revenue (IDR)	Average Monthly Profit (IDR)
1.	Telik	891.000	646.360	1.441.360	3.400.000	3.039.660
2.	Wuwu	411.000	243.000	493.000	1.987.500	1.864.250

C. BEP, R/C Ratio, and PP Calculation Results

A business feasibility analysis needs to be conducted because it can serve as an indicator that assists in decisions regarding the continuity of the business. This analysis is very important to measure the extent of profits obtained and whether it is feasible to run, so that fishermen know whether the fishing business can contribute to the economy sustainably [46]. A comparative analysis of the feasibility results of Barred Loach capture business in the Karang River using telik trap and wuwu trap is presented in Table III, which contains the calculation results of Break Even Point (BEP), Revenue Cost Ratio (R/C Ratio), Return on Investment (ROI), and Payback Period. This comparative analysis was conducted to determine the type of fishing gear that has the highest and lowest feasibility values in the Barred Loach capture business.

Table III. Results of BEP, R/C Ratio, and PP Calculations

No.	Indicator	Fishing Gear	
		Telik Trap	Wuwu Trap
1.	Investment Capital (IDR)	891.000	411.000
2.	Fixed Cost (IDR)	795.000	250.000
3.	Variable Cost (IDR)	646.360	243.000
4.	Total Cost (IDR)	1.441.360	493.000
5.	Revenue(IDR)	13.600.000	7.950.000
6.	Profit(IDR)	12.158.640	7.457.000
7.	BEP a. Production (Kg) b. Price(Rp/kg)	14,4 10.598	4,9 6.201
8.	R/C Ratio	9,4	16,1
9.	ROI	1365%	1814%
10.	Payback Period	9,0	6,8

V. DISCUSSION

A. Construction of Fishing Gear, Technical Operation, and Catch Production and by catch Composition

a.) Construction of Telik Trapand Wuwu Trap

The telik trap is considerably smaller than conventional fish traps. Its compact size is designed to match the body dimensions of the target species while accommodating the shallow and rocky environmental characteristics of the Karang River. The trap has a height of 18 cm, a maximum chamber diameter of 9 cm, and a minimum diameter of 5 cm. The structure consists of two openings, with the first opening fitted with an 8cm funnel entrance and the second opening serving as a removable harvesting outlet. The suspension rope is made of twisted raffia, and the trap cover is constructed from young bamboo segments. The size of the wuwu fishing gear is quite similar to that of typical bubu traps, although it is used to catch small fish such as Barred Loach. The size of the fishing gear adjusts to the fish catching method by damming and draining the water of the Karang River. The two wuwu have heights of 100cm and 65.5 cm, the largest cavity diameters are 28.6 cm and 21.9 cm, and the smallest cavity diameters are 25 cm and 18 cm. The first opening has a funnel height of 23 cm and 20 cm, with a tip diameter of 2 cm and 1.5 cm. The second opening has heights of 11 cm and 6 cm with diameters of 7 cm and 5 cm. The hanging rope is made of raffia and is 22cm and 19cm long. The bubulid installed on the second opening is made of wood pieces with heights of 6 cm and 5 cm and diameters of 7.3 cm and 5.2 cm.

b.) Technical Operation of Telik Traps

Fishing operations using telik traps are typically conducted between 03:00 and 04:00 WIB. Preparations begin by collecting approximately 20–30 trap units and attaching bait to each trap cover. The bait consists of raw peanuts, garlic, and steamed cassava. These ingredients are ground and fermented for approximately one month to produce a strong odor capable of attracting Barred Loach. Following preparation, fishers walk approximately 135 m to the fishing ground. The deployment (setting) process requires approximately 20–30 minutes. Fishers select shallow river margins with water depths ranging from 15 to 30 cm where Barred Loach is believed to be abundant. Traps are distributed at intervals of approximately 2–3 m. The riverbed is slightly excavated to ensure that the trap rests in a stable horizontal position. Subsequently, each trap is covered with stones, leaving only the entrance exposed. The stones serve both as markers for trap retrieval and as camouflage, creating a natural appearance that exploits the species' tendency to seek shelter among rocks. Knowledge of fish behaviour is therefore essential for designing effective fishing strategies and improving catch efficiency [6]. The soaking period (immersing) lasts approximately 3–4 hours. During this period, fishers usually return home and engage in other activities before revisiting the site. Retrieval (hauling) involves removing the covering stones and lifting the trap from the riverbed. Captured fish are temporarily stored in buckets and transported home, where sorting and handling procedures are conducted.

c.) Technical Operation of Wuwu Traps

Unlike telik fishing, wuwu fishing is conducted at night, generally between 22:00 and 22:30 WIB. Two trap units of different sizes are operated in separate fishing sessions. Both systems rely on river current dynamics; however, the larger trap targets fish moving down stream, while the smaller trap targets fish moving upstream. This local fishing technique is known as parakan or marak and is generally conducted once per day. An important aspect of fishing for Barred Loach using wuwu is the construction of a dam. When initiating the capture, fishermen first divide the river longitudinally into two sides like walls, spanning approximately 130 meters using piles of stones, separating the shallower riverbed from the deeper one. The purpose is to facilitate the fishermen in damming the water and redirecting its flow to the side of the river with a deeper bed. Additionally, the separation using stones higher than the water line also prevents the water flowing in the deeper side from entering the shal lower side. These stone walls are left intact even after the fishing trip is completed so that they can be reused for subsequent trips. When preparing for a fishing trip, fishermen travel to the fishing ground on foot for approximately 110 meters, carrying a flashlight to first inspect the condition of the river. If the water is clear and there are many Barred Loach gathered, fishermen can immediately take a small wuwu, a large wuwu, and a bucket to carry out the operation of catching Barred Loach.

1. Session1: Large Wuwu Tarp (100 cm)

The large wuwu trap is positioned at a naturally constricted section of the riverapproximately110mdownstream from the temporary dam. The trap is installed at an inclined angle with its entrance facing against the current. Fishers then construct a temporary dam using large stones, wooden boards, and plastic sheeting to obstruct water flow. Additional stones and clay-rich substrate are used to reinforce the structure and reduce seepage. The installation process generally requires 30–60 minutes. As water levels gradually decline, fish moving down stream become concentrated and enter the trap. The immersion period lasts approximately 1–1.5 hours, during which fishers monitor fish movements using flash lights. Once water flow has ceased and fish activity decreases, the trap is removed and placed in the remaining impounded water to keep the catch alive and fresh until marketing.

2. Session 2: Small Wuwu Trap (65,5 cm)

The second fishing session utilizes a smaller trap installed directly within the temporary dam structure. A portion of the stone barrier is removed, and the trap is positioned with its entrance facing the direction of water flow. This arrangement allows a limited volume of water to pass through the trap and gradually refill the previously drained section of the river. The immersion period for the small wuwu trap ranges from 4 to 5 hours. Fish that did not enter the larger trap often swim upstream in search of flowing water. The water passing through the smaller trap attracts these fish, increasing the likelihood of capture. During this period, fishers return home and rest before revisiting the fishing ground at approximately 04:30–05:30 WIB. Retrieval is followed by dismantling the temporary dam and transporting the catch home for sorting and processing. Captured fish are either delivered directly to buyers or stored temporarily in freezers.

d.) Catch Production and By catch Composition

The results indicate that telik and wuwu traps differ in both total catch production and catch composition. During the four-month observation period, telik traps produced a total catch of 136 kg from 104 fishing trips, whereas wuwu traps produced 79.5 kg from 54 fishing trips. Although the total production of telik traps was higher, the average catch per trip obtained using wuwu traps was generally greater. Average catches obtained using wuwu traps ranged from 1.25 to 1.62 kg $trip^{-1}$, while those obtained using telik traps ranged from 1.14 to 1.44 kg $trip^{-1}$. The by catch composition of both fishing gears consisted primarily of juvenile Bonylip Barp (Osteochilus vittatus) and freshwater shrimp. However, wuwu traps tended to capture substantially higher quantities of by catch than telik traps, indicating that telik traps exhibit greater selectivity toward the target species. By catch was generally not marketed and was instead used as household food. In some cases, fishers operating telik traps discarded the by catch because the quantities captured were too small to be utilized effectively.

C. Business Feasibility of Barred Loach Fishing Using Telik Trap and Wuwu Trap

1) Investment Capital: The investment capital required for Barred Loach fishing varied according to the fishing gear employed. Fishers operating telik traps invested IDR 891,000, whereas those using wuwu traps invested IDR 411,000.

2) These differences were primarily attributable to the number of fishing gear units and supporting equipment required for each operation. Compared with marine capture fisheries, which typically require vessels and larger-scale equipment, Barred Loach fishing in the Karang River represents a relatively small-scale fishery characterized by modest capital requirements and simple fishing technology. Such fisheries are commonly operated by fishing households and contribute primarily to local food supply systems [39].
3) Cost Structure: Fishing costs consisted of fixed costs, variable costs, and total costs. During the observation period, fishers using telik traps incurred a total cost of IDR 1,441,360, comprising fixed costs of IDR 795,000 and variable costs of IDR 646,360. In contrast, fishers using wuwu traps incurred total costs of IDR 493,000, including fixed costs of IDR 250,000 and variable costs of IDR 243,000. Fixed costs were primarily associated with depreciation expenses, as neither fishing gear required significant maintenance or repair expenditures. Furthermore, labor costs were absent because each fishing enterprise was operated individually by a single fisher.
4) Revenue: Revenue represents the monetary value generated from fish sales. The marketing system employed by both fishing enterprises did not involve profit-sharing arrangements because each enterprise was managed in dependently by a single fisher. Average monthly revenue generated by telik traps reached IDR 3,400,000, equivalent to approximately IDR 130,769 per fishing trip. In contrast, wuwu traps generated average monthly revenue of IDR 1,987,500, corresponding to approximately IDR 147,222 per trip. Although monthly revenue from wuwu fishing remained below the regional minimum wage of Purbalingga Regency (IDR 2,474,722,), revenue generated per trip exceeded the average daily wage of casual laborers in the area (IDR 100,000, per day).
5) Profitability: Profitability followed a similar pattern. Average monthly profit generated by telik fishing reached IDR 3,039,660, where as wuwu fishing generated an average monthly profit of IDR 1,864,250.Businessprofitis determined by the balance between total revenue and total expenditure; therefore, enterprises producing positive net returns are considered economically profitable. The factors that influence the amount of profit of a business are the total costs incurred and the amount of revenue earned. If the calculation results in a negative number (-), the business experiences a loss because the total costs used are greater than its revenue. Profit represents the value derived from a business's revenue after deducting the total costs incurred. A business can be considered profitable if the result of subtracting expenses (total costs) from revenue is positive. [42].
6) Break Event Point (BEP): Break-Even Point (BEP) analysis was conducted to determine the minimum production volume and selling price required for the fishing enterprise to cover all operational costs. Two indicators were evaluated: BEP production and BEP price. The results showed that the BEP production value for the telik fishing enterprise was 14.4 kg over a four-month period, with a BEP selling price of IDR 10,598 kg^{-1}. This indicates that the enterprise would reach its break-even point if it produced at least 14.4 kg of Barred Loach and sold the catch at a minimum price of IDR 10,598 kg^{-1}. For the wuwu fishing enterprise, the BEP production value was 4.9 kg, while the BEP price was IDR 6,201 kg^{-1}. Therefore, the enterprise would achieve a break-even condition when production reached 4.9 kg during the four-month fishing season and fish were sold at a minimum price of IDR 6,201 kg^{-1}. The differences in BEP values between the two fishing methods were primarily attributable to differences in total production and operational costs. BEP analysis provides important information regarding the minimum economic performance required to ensure that a fishing enterprise neither incurs losses nor generates profit.
7) Revenue Cost Ratio (R/C Ratio) : The Revenue-Cost Ratio (R/C Ratio) was used to evaluate the economic efficiency of each fishing enterprise. This indicator was calculated by dividing total revenue by total production costs incurred during the four-month observation period. Fishers operating telik traps generated total revenue of IDR 13,600,000 with total costs of IDR 1,441,360. Consequently, the R/C Ratio was 9.4, indicating that every IDR 1 invested in the fishing operation generated IDR 9.4 in revenue. Similarly, fishers using wuwu traps generated total revenue of IDR 7,950,000 with total costs of IDR 493,000, resulting in an R/C Ratio of 16.1. This value indicates that every IDR 1 spent on productiongeneratedapproximatelyIDR16.1inrevenue.SincebothenterprisesproducedR/CRatiovaluesgreater than one (R/C > 1), both fishing methods can be classified as economically feasible and profitable. However, the substantially higher R/C Ratio observed for the wuwu trap suggests superior economic efficiency compared with the telik traps.
8) Rate on Investment (ROI) : Return on Investment (ROI) analysis was performed to assess the profitability of invested capital. ROI measures the extent to which investment expenditures generate financial returns. During the study period, fishers operating telik traps generated total profits of IDR 12,158,640 from an investment capital of IDR 891,000. The resulting ROI value was 13.65, equivalent to 1365%, indicating that the investment generated returns more than thirteen times greater than the original capital invested. In comparison, fishers operating wuwu traps earned total profits of IDR7,457,000 from an investment of IDR 411,000. The ROI value reached 18.14, or 1814%, indicating an even greater return relative to the initial investment. These findings demonstrate that both fishing methods provided exceptionally high investment returns, with the wuwu fishing enterprise exhibiting the highest level of profitability relative to capital expenditure.
9) Payback Period (PP): Payback Period (PP) analysis was conducted to estimate the time required for fishers to recover their initial investment capital. The telik fishing enterprise required an investment of IDR 891,000 and generated profits of IDR 12,158,640 during the four-month fishing season. The calculated PP value was equivalent to approximately 9.0 days, indicating that the initial investment could be fully recovered within nine days of operation. For the wuwu fishing enterprise, an investment of IDR 411,000 generated profits of IDR 7,457,000. The resulting PP value was approximately 6.8 days, indicating that the investment could be recovered within seven days. Both enterprises exhibited remarkably short payback periods, well below the commonly accepted feasibility threshold of three years.

10) Consequently, both fishing methods can be considered financially attractive due to their rapid capital recovery rates. Payback Period is an analytical method used to calculate the period for the return of investment costs incurred in a fishing business. The faster the return, the better the business pattern because of smooth capital turnover. The longer the period exceeds the maximum provision; the business is considered unfeasible to continue [8].
11) Overall Business Feasibility Analysis: The overall feasibility assessment demonstrated that Barred Loach fishing enterprises in the Karang River are economically viable regardless of whether telik or wuwu traps are employed. Nevertheless, the wuwu fishing method exhibited superior economic performance. This conclusion is supported by its higher R/C Ratio (16.1 compared with 9.4 for telik), higher ROI (1814% compared with 1365%), and shorter Payback Period (6.8 days compared with 9.0 days). Although wuwu traps were operated in fewer fishing trips (54 trips) than telik traps (104 trips), the lower number of trips substantially reduced variable costs. Combined with relatively high catch rates per trip, this resulted in a larger gap between revenue and total cost, thereby improving overall economic efficiency. These findings suggest that the wuwu fishing method provides the most favorable balance between operational expenditure and financial return. Business feasibility analyse is plays an essential role in evaluating the sustainability of fishing enterprises. Through the assessment of financial indicators such as BEP, R/C Ratio, ROI, and PP, fishers can determine whether a particular fishing operation is capable of generating long-term economic benefits and contributing to household livelihoods. The results of this study confirm that Barred Loach fishing in the Karang River represents a profitable and sustainable economic activity for local communities [45].

VI. CONCLUSIONS

1. The telik and wuwu traps used in the Karang River possess bottle-shaped and cylindrical configurations, respectively, and consist of a trap body, two openings, a funnel-shaped entrance (injab), a cover, and a suspension rope. The teliktrap has a body height of 18cm and a maximum diameter of 9cm, where as the wuwu traps have body lengths of 100cm and 65.5 cm with maximum diameters of 28.6 cm and21.9 cm, respectively. Both fishing gears are constructed from woven bamboo and raffia rope. Fishing operations involve three principal stages: setting, immersing, and hauling. The primary target species captured by both gears was the Barred Loach (Nemacheilus fasciatus). During the four-month study period, teliktraps produced a total catch of 136 kg, while wuwu traps produced 79.5 kg.
2. Barred Loach fishing enterprises in the Karang River using both telik and wuwu traps were found to be financially feasible. For the telik fishing enterprise, the BEP price and production values were IDR 10,598 kg^{-1} and14.4kgperfour-month season, respectively. The enterprise achieved an R/C Ratio of 9.4, an ROI of 1365 %, and a Payback Period of 9.0 days. For the wuwu fishing enterprise, the BEP price and production values were IDR6, 201kg^{-1} and 4.9kg per four-month season, respectively. The enterprise achieved an R/C Ratio of 16.1,an ROI of 1814%, and a Payback Period of 6.8 days. These results indicate that both fishing methods are economically viable, with the wuwu trap demonstrating superior financial performance and efficiency.

Author contribution Statement

Conceptualization: Hajarani Nadiyalslam,
Literature Review and Methodology design: Trisnani Dwi Hapsari, Aristi Dian Purnama Fitri
Software: Hajarani Nadiyalslam
Validation: Aristi Dian Purnama Fitri
Formal Analysis: Trisnani Dwi Hapsari, Aristi Dian Purnama Fitri
Investigation: Hajarani Nadiyalslam
Resources: Trisnani Dwi Hapsari, Aristi Dian Purnama Fitri
Data Curation: Aristi Dian Purnama Fitri
Writing original draft preparation: Hajarani Nadiyalslam
Writing review and Editing: Aristi Dian Purnama Fitri
Visualization: Hajarani Nadiyalslam
Supervision: Trisnani Dwi Hapsari, Aristi Dian Purnama Fitri
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