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Productivity of Handling Fishing in Fisheries Small-Scale Catching in Banabungi Village, Sub-District Pasarwajo, Buton Regency

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Abstract

This study aims to analyze the technical operation of handline fishing gear, productivity levels, determinants of catch results and the economic feasibility of small-scale handline fishing units in Banabungi Village, Pasarwajo District, Buton Regency.

The research was conducted from January to February 2026 using the methodsimple random samplingof 15 active fishermen. The results showed that the fishing fleet was dominated by wooden boats (<5GT) with 5-13 HP katinting engines.

The main catch is dominated by high-value demersal fish, especially red snapper (39%), sunu grouper (25%), lencam (16%), mackerel (13%), and skipjack tuna (7%). The average catch productivity of fishermen is 19.2 kg per trip. Financially, this business is very profitable and efficient with a R/C ratio of 6.7, with a gross income of Rp 1,000,000 and a net income of Rp 850,000 per trip.

Keywords: Handline, Productivity, Capture Fisheries, Banabungi

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Introduction

As the world's largest archipelagic nation, Indonesia has abundant marine resource potential, with extensive fisheries management areas. The capture fisheries sector is the economic backbone of millions of coastal communities, the majority of whom are small-scale fishermen. Small-scale fishermen are characterized by the use of simple technology and limited capital, but have a crucial role in maintaining food security, animal protein, and the sustainability of marine ecosystems (Saksono et al., 2023).

Southeast Sulawesi Province, particularly Buton Regency, is a region highly dependent on the maritime sector. Geographically, Buton Regency is surrounded by the Banda Sea and the Flores Sea, known as migration routes for both large and small pelagic fish. Banabungi Village, located in Pasarwajo District, is one of the centers of capture fisheries activity in the regency.

In Banabungi Village, the majority of fishermen use handline fishing gear. The selection of this fishing gear is based on several main factors, including economic factors, including relatively affordable investment and operational costs for local fishermen. Furthermore, technical factors include its simple operation and ability to be carried out individually (one-man operation), as well as factors Ecologically, namely handline fishing which is known as a very selective and environmentally-friendly fishing tool

because it does not damage the seabed habitat and minimizes bycatch (bycatch) unwanted (Wuaten et al., 2022).

However, despite this potential, handline fishermen in Banabungi Village face fluctuating productivity dynamics. Fishing productivity is influenced not only by the availability of fish stocks in the wild but also by technical factors such as variations in fishing gear design (hooks and line diameter), bait availability and type (live bait vs. artificial bait), and the extent of fishing areas (fishing ground) which is increasingly far away due to fishing pressure in coastal areas and local oceanographic conditions such as currents, sea surface temperatures, and moon phases which influence fish distribution patterns in Pasarwajo Bay.

Apart from technical factors, economic aspects, such as fluctuations in fuel prices (BBM) and supply chains long-term trade arrangements often result in thin profit margins for fishermen, even when the physical catch is sufficient. This raises questions about the extent to which the efficiency and productivity of this handline fishing gear are able to ensure the long-term survival of fishermen in Banabungi Village (Adhawati et al., 2023).

To date, detailed data on the technical performance and productivity of handline fishing in Banabungi Village remains limited. Catch Per Unit Effort (CPUE) is essential as a database for sustainable fisheries management. Without accurate productivity analysis, government assistance policies and the development of fisheries infrastructure in Pasarwajo District risk being misdirected.

Based on the description above, the productivity of handlines in small-scale capture fisheries in Banabungi Village, Pasarwajo District, Buton Regency is very important to be carried out to provide a real picture of the condition of local capture fisheries and to be a consideration for stakeholders in formulating small-scale fisheries development strategies in Buton Regency.

Method

This research was conducted in January-February 2026. The research location was centered in Banabungi Village, Pasarwajo District, Buton Regency, Southeast Sulawesi Province. The location was selected randomly purposive (intentionally) with the consideration that Banabungi Village is a coastal village with a concentration of handline fishermen (handline) is quite high in the Pasarwajo Bay area.

The population in this study was all handline fishermen in Banabungi Village. Sampling was conducted using the Simple Random Sampling. The number of respondents taken was 15 active fishermen who regularly land fish at the boat moorings in Banabungi Village.

The data collected consists of two types, namely primary data: obtained through observation direct (following fishing operations), in-depth interviews with fishermen, and measuring the weight of the catch at the landing site and secondary data: obtained from the annual report of the Buton Regency Fisheries Service, the monograph of Banabungi Village, and scientific literature/journals relevant to fisheries productivity.

Results and Discussion

General Condition of the Research Location

Figure 1. Overview of the Research Location

Banabungi Village is a center of fishing activity in Pasarwajo District, boasting a strategic coastline. Most residents rely on small-scale capture fisheries for their livelihood. Supporting facilities, such as a boat dock and market access in Pasarwajo, facilitate the distribution of their catch.

Research Result

Technical Specifications of the Capture Unit

The technical characteristics of the handline fishing gear used by small-scale fishermen in Banabungi Village are presented in Table 1.

Table 1. Technical Characteristics of Hand Line Fishing Gear

Component	Specifications/Description
Capture Fleet	Wooden boat (stem body/kole-*kole*), < 5GT
Machine	Outboard motor (*katinting*) 5 HP – 13 HP
Main Rope (main line)	PA monofilament, number 50 – 100 (length 100 – 150 meters)
Fish Hook (hook)	Numbers 7, 8, 9, and 12 (steel/stainless steel)
Weight (sinker)	Tin in the form of ovals or stones (200 – 500 grams)
Bait	Scad fish, tembang or squid (live/dead)

Composition of Catch Results

The estimated catch during the research period, which was dominated by demersal fish with high economic value is presented in Table 2.

Table 2. Composition of the Catch

No	Types of Fish	Scientific Name	Amount (kg)	Percentage (%)
1	Red Snapper	Lutjanussp.	125	39
2	Sunu Grouper	Plectropomussp.	82	25
3	Lencam	*Plectropomus* sp.	50	16
4	mackerel	Scomberomorussp.	41	13
5	Cob	Euthynnussp.	24	7
Total			322	100

Capture Unit Productivity (CPUE)

Productivity is calculated based on the average catch per trip (Catch Per Unit Effort) during the observation provided in Table 3.

Table 3. Average catch per trip

Observation Month	Number of Trips	Total Catch (kg)	CPUE (kg/trip)
Week I	12	187	15.6
Week II	10	196	19.6
Week III	14	248	17.7
Week IV	11	262	23.9
Average	11.7	223.3	19.2

Cost and Revenue Analysis (Per Trip)

The operational economic efficiency of handline fishing in Banabungi Village are shown in Table 4.

Table 4. Economic Efficiency of Handline Operations

Cost/Revenue Components	Value (Rupiah)	Information
Fuel (Gasoline)	Rp. 85,000	Average 7-10 liters
Feed & Consumption	Rp. 65,000	Ice, cigarettes and supplies
Total Operating Costs	Rp. 150,000	(A)
Catch Results (Average)	20 kg	
Average Selling Price	Rp. 50,000	Per kg (mixture)
Gross Income	Rp. 1,000,000	(B)
Net income	Rp. 850,000	(B – A)

R/C Ratio : 6,7

Discussion

Technical Specifications of the Capture Unit

a. Small Fleet Efficiency (< 5 GT)

The use of small boats (<5 GT) in Banabungi Village is not without reason. The type of boat with a stem body or *kole-kole* was chosen because of its accessibility, making it easier for fishermen to maneuver in coral crevices or between the lift nets, which often serve as fish gathering points. Furthermore, because of cost efficiency, including the small boat size, which directly correlates with low fuel consumption (an average of 7–10 liters per trip). This is crucial for the economic sustainability of small-scale fishermen in Pasarwajo. Also because of its stability, despite its small size, the local Butonese boat design is known to

be stable against the waves around Pasarwajo Bay. This is in line with Charles's (2001) statement in his theory of Sustainable Fishery Systems, namely that small-scale fleets with *katinting* engines (such as in Banabungi) have an adaptive advantage, whereas small-scale fisheries with low-energy fleets (low energy consumption) have a higher level of economic efficiency in dealing with fuel price fluctuations compared to industrial fleets, due to the much lower operational input costs per catch. The use of *kole-kole* or rod bodies demonstrates that fishermen optimize costs to maximize net profits.

b. Monofilament Rope Material

The use of PA (Nylon) monofilament rope number 50-100 is a technical standard that is adjusted to the target catch, where the monofilament rope is transparent in the water (low visibility), so it does not scare sensitive fish such as Red Snapper, the flexible nature of nylon functions as a shock absorber when large fish suddenly resist, so the rope does not break easily. Furthermore, the rope number 50-100 is able to withstand tensile loads (breaking strength) of up to tens of kilograms, enough to lift Grouper or Snapper of consumption size (1-5 kg). This is in line with Brandt's statement (2005) in his book Fish Catching Methods of the World, the choice of material determines catchability (catch rate) where the transparency of nylon monofilament material (PA) in the water reduces the alertness of predatory fish. In addition, nylon's refractive index is close to that of seawater, making the fishing gear almost invisible, which significantly increases the biting rate of demersal fish." The use of rope numbers 50–100 is a balance between tensile strength (to counteract water currents) and camouflage of the gear.

c. Selectivity of Fishing Hook (Hook)

The use of hooks numbered 7 to 12 indicates a specific fishing strategy, where small hooks (7-9) are used to target pelagic fish or medium-sized reef fish, large hooks (10-12) are used specifically when fishermen target large demersal fish in deeper waters. Furthermore, the selection of stainless steel or carbon steel is important because the high salinity of seawater in the Buton region can accelerate corrosion (rust) which can reduce the sharpness of the fishing rod tip. This is in accordance with the statement of Martasuganda (2008), a fishing gear expert from IPB, explaining the characteristics of handlines which are fishing gear that have a high level of selectivity, both in terms of species and size. Hook size (hook size) is positively correlated with the size of the mouth of the target fish, so that technically this tool is able to prevent the capture of immature fish (immature). The use of fishing rod numbers 7–12 is a form of independent resource management by fishermen to maintain fish stocks in the waters.

d. Depth and Weight Level (Sinker)

A lead or stone sinker weighing 200-500 grams plays a crucial role in countering underwater currents, considering that the waters of Banabungi Village have a steep depth. The sinker must be strong enough tocarry the bait to the seabed before being carried away by the current away from the target point. Furthermore, there is a combination of using live bait, namely with the "poncor" technique (playing the line up and down) creating an illustration of natural movements that stimulate the predatory instincts of fish on the seabed. This is in line with Subani and Barus (1989) who stated that the success of handline fishing in waters with strong currents and high depths depends greatly on the balance between the weight of the sinker (sinker) with the diameter of the main line. The ideal weight should be able to keep the line vertical (perpendicular) so that the bait can reach the 'fishing zone' accurately. The use of weights up to 500 grams demonstrates the fishermen's technical adaptation to the morphology of the seabed in steep, current-prone waters.

Composition of Catch Results

Dominance of Red Snapper (Lutjanussp.) and Grouper (Epinephelussp.) which reached more than 60% of the total catch is a strong indicator that the condition of the coral reefs in the surrounding waters Banabungi still functions well as feeding ground (feeding area). This group of fish is the top predator in the coral ecosystem, where their presence in large numbers indicates that the availability of small fish (prey) is still abundant. The high composition of Red Snapper (39%) in the catch in Banabungi Village is in line with Genisa's (1999) statement that handlines operated in coral areas will be dominated by the family of Lutjanidae. This is also reinforced by Monintja (2000) who stated that the selectivity of fishing lines is greatly influenced by the size of the hook used.

Although hand lines are generally aimed at demersal fish, the appearance of mackerel and skipjack tuna (around 20%) indicates a phenomenon of multispecies fishery. This is a seasonal interaction where the presence of these pelagic fish usually follows the currents and abundance of plankton in Pasarwajo Bay. During certain seasons, these fish migrate closer to the Banabungi coast to chase schools of anchovies (Stolephorus sp.). This is in line with the emergence of pelagic fish in demersal fishing gear by Nontji (2005) in his book Laut Nusantara which states that the waters of Sulawesi and its surroundings have deep water characteristics that are rich in upwelling. This causes overlapping habitats between demersal and pelagic fish in the neritic zone, allowing bottom fishing gear to catch pelagic species that are undergoing vertical migration to search for food. Fishermen often use the "push-pull" technique in the middle water column (mid-water) before the line actually reaches the bottom, which inadvertently attracts pelagic fish that are actively hunting in that layer.

Based on size observations, most of the catch is in the adult category. This is supported by Monintja (2000) who stated that fishing gear has the following properties: passive gear which relies heavily on the fish's initiative to take the bait. Only fish with a mouth opening size that matches the hook number (in this case numbers 7-12) will be caught. By not catching young fish (juvenile), the broodstock in the waters of Banabungi Village is maintained, so that the natural recruitment process of fish in these waters is not interrupted. This is also reinforced by Mallawa (2012) who emphasized the importance of size composition in the catch, where the sustainability of handline fishery resources is guaranteed by the mechanical limitations of the equipment itself. Fish caught are generally predatory individuals, which have usually reached adult size (size at first maturity). Biologically, this gives the fish population the opportunity to spawn at least once before being caught."

Capture unit productivity (CPUE)

Based on research data, the average CPUE of 19.2 kg/trip indicates quite high performance for a small-scale fishery. Analysis of Variance shows that the difference in yield between the lowest (15.6 kg/trip) and the highest (23.9 kg/trip) is greatly influenced by the fishermen's accuracy in reaching the fishing ground. With an average operating time of 6–10 hours, fishermen are able to produce almost 2 kg of fish per hour. This indicates that the waters around Banabungi Village are still in a "fertile" condition and have not experienced excessive fishing pressure overfishing. This is in accordance with Gulland's (1983) statement in his book Fish Stock Assessment, which states that Catch Per Unit Effort (CPUE) is the best indicator to describe the relative abundance of a fish stock. If the CPUE value is stable or increases with constant effort, it can be assumed that the fishery resources in the area are still well maintained.

Handline productivity in Pasarwajo District is highly sensitive to water column dynamics. Strong currents in Pasarwajo waters force fishermen to add weights. If the current exceeds the technical threshold, the hook will not reach the bottom (the habitat of snapper/grouper), thus reducing the value. CPUE dropped drastically. Buton waters also frequently experience water mass agitation, bringing nutrients to the surface. This increases fish feeding activity (feeding activity), which directly increases the chances of the bait being hit (hook rate). This is supported by the statement of Sparre and Venema (1998) who stated that fishing productivity is not only influenced by fish abundance, but also by Catchability Coefficient (catchability coefficient), which includes the skill of the fisherman, the efficiency of the fishing gear, and environmental conditions such as current and water temperature."

There is a positive correlation between fishermen's experience and the stability of CPUE values. Senior fishermen in Banabungi use natural landmarks (mountains or headlands) to position their boats directly above coral holes. The accuracy of this position determines the effectiveness of their efforts. The use of more powerful fishing engines allows fishermen to reach more distant fishing grounds (outside the bay) when productivity in nearshore waters declines. This is reinforced by Polunin and Roberts (1996), who stated that healthy coral reef ecosystems can provide a high production surplus for selective fishing gear such as fishing rods. The efficiency of fishing units in this ecosystem is highly dependent on the equipment's ability to operate in complex bottom structures. Productivity values in Banabungi Village indicate that handlines are the most rational fishing gear choice for small-scale fishermen. With low capital investment, they are able to achieve a stable catch (19.6 kg/trip), which is economically far beyond the break-even point (break-even point).

Cost and Revenue Analysis (Per Trip)

Based on the calculation above, the R/C Ratio value is 6.7. This value indicates that every Rp 1,000 in costs incurred by fishermen in Banabungi Village will generate revenue of Rp 6,700. This is in accordance with the theory of fisheries economics, if the R/C value > 1, then the business is declared feasible and profitable. With a value of 6.7, the handline fishing business has a very high profit level (very feasible). This is in accordance with Marrisa (2010), who stated that the R/C ratio value (Revenue/Cost) > 1 indicates a feasible and profitable business, because every rupiah of costs generates greater revenue. This approach is common in fisheries economic analysis (aquaculture/ fishermen) to measure efficiency, where R/C > 1 means profit, R/C < 1 loss, and R/C = 1 break-even.

The high R/C Ratio is influenced by the characteristics of the handline as low-cost fishing gear. Fishermen do not need expensive net maintenance costs or a large crew (usually done individually/one-man operation). This is in line with the opinion of Suratiyah (2006) who stated that the smaller the variable costs incurred in a production process without reducing the output volume, the higher the level of business efficiency will be.

Technically, with a cost of Rp150,000 per trip and a fish price of Rp50,000/kg, fishermen only need to catch about 3 kg of fish to break even. Considering the average catch reaches 19.6 kg, the risk of financial loss per trip for fishermen in Banabungi Village is relatively small. This is in accordance with Soekartawi (2002) who explained regarding marketing and pricing efficiency that fisheries businesses will have a high R/C ratio if the commodities produced have a high selling value in the market (high-value species). Demersal fish caught on line are of premium quality, keeping prices stable above average costs. The productivity of handline fishing in Banabungi Village is not only ecologically sustainable (due to its selective nature) but also highly profitable financially. The combination of the rich fish resources in Pasarwajo waters and the low operating costs of fishing

gear make handline fishing a key pillar of the household economy of fishermen in the village.

Conclusion

The handline fishing system in Banabungi Village remains traditional yet highly effective. The fishing fleet is dominated by wooden boats (*Bodi Batang*) with 5-15 HP outboard engines. The fishing gear used is simple in construction, consisting of monofilament nylon line and 7-9 hooks.

The average productivity or Catch Per Unit Effort (CPUE) of handline fishermen at the research site was 19.2 kg per trip. This value indicates that the waters around Pasarwajo District still have good pelagic fish resource potential for small-scale fishermen.

Fishing success is greatly influenced by the use of live bait (anchovies/fish) and the presence of fish aggregating devices (FADs). Furthermore, weather conditions and operating hours (morning and evening) are key factors in determining catch results.

Economically, the handline fishing business in Banabungi Village is still viable with an average net income that is able to cover operational costs (fuel and logistics), although it is very sensitive to fluctuations in fuel prices and fish selling prices in the market.

References

Achmadi. A., Hestirianoto. T., Manik. H, M. 2014. Deteksi Schooling Ikan Pelagis Dengan Metode Hidroakustik Di Perairan Teluk Palu, Sulawesi Tengah. *Jurnal Teknologi Perikanan dan Kelautan* Vol. 5

Adhawati, S. S., Cangara, A. S., Fakhriyyah, S., Kamaruddin, K., & Aswin. (2023). Nilai Ekonomi dan Produktivitas Alat Tangkap Perikanan. Samudra Ekonomi Dan Bisnis, 14(1), 37–48.

Inizianti, R.L. 2010. Analisis Spasial Daerah Penangkapan Tuna Kapal PSP01 Di Perairan Selatan Jawa Barat. Skripsi. Bogor: Institut Pertanian Bogor

Imanda, S. N., Setiyanto, I., & Hapsari, T. D. (2016). Analisis Faktor-Faktor yang Mempengaruhi Hasil Tangkapan Kapal Mini Purse Seine di Pelabuhan Perikanan Nusantara Pekalongan. *Journal of Fisheries Resources Utilization Management and Technology,* 5(1), 145-153.

Katimpali, R. P., I. J. Paransa & M. E. Kayadoe. 2012. Pengaruh Penambahan bentangan horizontal pada pancing dasar terhadap hasil tangkapan ikan-ikan karang. *Jurnal Ilmiah dan Teknologi Perikanan Tangkap.* 1(2): 50-56

Kristiawan, H.A., H. Boesono & A. D. Purnama F. 2013. Perbedaan Penggunaan Mata Pancing dan Jaket Tuna Terhadap Kecepatan Penarikan Hasil Tangkapan Tuna (Thunnus albacares) dengan Alat Tangkap Pancing Ulur di Perairan Sukabumi, Jawa Barat. *Journal of Fisheries Resources Utilization Management and Technology.* 2 (1): 104-113

Karyanto, E. Reppie & J. Budiman. 2014. Perbandingan hasil tangkapan tuna hand line dengan teknik pengoperasian yang berbeda di Laut Maluku. *Jurnal Ilmu dan Teknologi Perikanan*. 1(6) 221-226

Nasution. A. F, Noor. M. T, Saraswati. X. 2025. Pengaruh Perbedaan Kedalaman Setting pada Alat Tangkap Pancing Ulur terhadap Hasil Tangkapan Ikan Madidihang (Thunnus Albacares) di Perairan Mentawai yang Didaratkan di Pelabuhan Perikanan Samudera Bungus. DOI: https://doi.org/10.62951/manfish.v3i1.129

Nawwaf. M .2024. Analisis Faktor-Faktor Yang Mempengaruhi Produktivitas Purse Seine Di Perairan Selat Makassar Kabupaten Pinrang M Studi Pemanfaatan Sumberdayaperikanan Departemen Perikanan Fakultas Ilmu Kelautan Dan Perikanan Universitas Hasanuddin Makassar. Skripsi

Nontji, A. (2005). *Laut Nusantara*. Jakarta: Djambatan.

Rahmat, E. 2007. Penggunaan Pancing Ulur (Hand Line) untuk Menangkap Ikan Pelagis Besar di Perairan Bacan, Halmahera Selatan. *Buletin Teknik Litkayasa*. 6(1):29-33.

Rahmat, E & A. Salim. 2013. Teknologi Alat Penangkapan Ikan Pancing Ulur (handline) Tuna di Perairan Laut Sulawesi Berbasis di Kabupaten Kepulauan Sangihe. *Buletin Teknik Litkayasa*.

Ramlah S., Adimu. H.E., Asni, dan Latifa Fekri. (2022). Pengembangan Usaha Perikanan Tangkap Skala Kecil Di Kabupaten Kolaka, Sulawesi Tenggarah. akultas Pertanian Perikanan dan Peternakan, Universitas Sembilanbelas November Kolaka & Fakultas Perikanan dan Ilmu Kelautan, Manajemen Sumberdaya Perairan, Universitas Halu Oleo.

Saksono, H., Nissa, Z. N. A., & Suadi, S. (2023). Small-Scale Fisher's Livelihood Strategies: Findings from Case Studies in Several Indonesian Coastal Areas. Jurnal *Perikanan* Universitas Gadjah Mada, 25(1), 9–9.

Subani, W. dan H.R. Barus. 1989. *Alat Penangkapan Ikan dan Udang Laut di Indonesia*. Jurnal Penelitian Perikanan Laut No. 50. Balai Penelitian Perikanan Laut. Jakarta**.**

Suharso, S. (2016). Elastisitas Produksi Perikanan Tangkap Kota Tegal (Doctoral dissertation, Program Pasca Sarjana Universitas Diponegoro).

Tamarol, J, & J. F. Wuaten. 2013. Daerah Penangkapan Tuna (Thunnus sp.) di Sangihe, Sulawesi Utara. *Jurnal Perikanan dan Kelautan Tropis*. IX-2

Tesen, M, & R.Y.F. Hutapea. 2020. Studi Pengoperasian Pancing Ulur dan Komposisi Hasil Tangkapan Pada KM Jala Jana 05 di WPP 572. *Aurelia Journal*. 1 (2). Indonesia:Politeknik Kelautan dan Perikanan Dumai.

Wuaten, J. F., Bawias, I., Tatontos, Y. V., Sambeka, Y., & Kapai, D. (2022). Alat Tangkap Ikan Tradisional Berdasarkan Parameter Selektivitas dan Hasil Tangkapan Sampingan Code of Conduct for Responsible Fisheries di Pulau Mahumu. *Jurnal Ilmiah Tindalung*, 8(1), 7–11.