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IMPACT OF ARTISANAL FISHING GEAR ON CATCH COMPOSITION AND VOLUME, AND RELATIVE ABUNDANCE OF SPECIES: A CASE STUDY ON THE EAST COAST OF PENINSULAR MALAYSIA

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ABSTRACT

Different types of fishing gear tend to capture different compositions of fish species. However, there is a lack of empirical evidence supporting these relationships on the East Coast of Peninsular Malaysia. Hence, this study examines the impacts of artisanal fishing gear on catch composition and volume, and relative abundance of species in this region. This study used primary data collected through face-to-face interviews in the three states on the East Coast of Peninsular Malaysia: Kelantan, Terengganu, and Pahang. Three hundred artisanal fishers were interviewed from October 2023 to May 2024. Data was analysed using descriptive analysis. The findings revealed that 45 species were caught by all methods, with gill nets hauling in 37 species, traps (26 species), and hooks and lines (23 species). Gill nets also caught the largest weight of fish (10,886 kg), followed by traps (8,651 kg) and hand lines (5,713 kg). The main species caught according to the type of fishing gear are Indian mackerel (24.80%) by gill nets, squid (26.99%) by hook and line, and Japanese threadfin bream (65.02%) by traps. These studies suggest that fisheries management policies should emphasise gear selectivity and responsible fishing practices to ensure sustainable resource utilisation.

Introduction

Artisanal methods to catch fish often involve simple, traditional tools such as basic traps, traditional boats and other rudimentary equipment (Batista *et al*., 2014). Even though artisanal fishing is often small-scale, these two terms are not interchangeable. While artisanal fishing emphasises simplicity and traditional practices, small-scale fishing is more about the volume of operations (Batista *et al*., 2014). Artisanal fishing is generally a form of subsistence fishing, where the catch is mainly to feed the fisherman's family or local community (Rahman *et al*., 2020). It requires minimal capital investment, relying on basic technology and long-standing traditions (Akhtar *et al*., 2017). The people who conduct artisanal fishing typically reside in coastal areas, passing down techniques and knowledge from one generation to the next (Rahman, 2017). Thus, those who depend on artisanal fishing for their livelihood, follow practices that are passed down through generations, and use traditional methods and equipment are known as artisanal fishers.

On the East Coast of Peninsular Malaysia, the fishing industry is dominated by artisanal fishers using traditional fishing methods and equipment for small-scale fishing. Despite the limited scope of their operation, in aggregate, artisanal fishers contributed for about 80% of the total fish landings in Malaysia (Department of Fisheries Malaysia, 2022). Different types of fishing gear such as gill nets, traps and handlines, are commonly used by artisanal fishers, resulting in different catch compositions, volumes and species abundance. Catch composition refers to the variety of fish species caught, and it is mostly influenced by the fishing gear used (Rubel *et al*., 2014). Previous research (McClanahan and Mangi, 2004; Sarker *et al*., 2008; Rubel *et al*., 2014; Santana-Morales *et al*., 2020; and Cerbule *et al*., 2022) has shown that catch composition differs depending on the type of fishing gear used.

In general, the composition of catches in artisanal fisheries varies based on factors such as gear type, area, season, and management measures. Humphries *et al*. (2019) found that *Etelis coruscans*, *Gymnocranius microdon*, *Lutjanus timoriensis*, and *Nemipterus furcosus* were usually caught using handlines, whereas most herbivorous species, including *Scarus xanthopleura*, *Acanthurus mata*, *Naso brevirostris*, *Naso caeruleacauda*, *Naso literatus*, *Naso unicornis*, and *Naso vlamingii*, were captured using spearguns. Gill nets catch the most types of species but longlines and traps catch more commercially valuable fish species (Hidayati & Mohamad, 2024).

The effects of the hook and line method on catch rate, species composition, and size selectivity of fish are influenced by hook size and design, fishing strategy, bait type, and size (Herrmann *et al*., 2018), and the use of accessories like swivels and floats. Smaller hooks may lead to more catches of less desirable species, which can be time-consuming to remove and may damage the gear. Increases in hook size led to fishes of larger sizes (Yamashita *et al*., 2009; Campbell *et al*., 2014; Garner *et al*., 2014). However, handline fishery yields better capture rates with smaller hooks (Bacheler & Buckel, 2004; Mongeon *et al*., 2013). For example, reducing the hook size increases the catch rates of both Spotted Rose Snapper and most of the bycatch species. When the size of the hook increased, the mean size of Spotted Rose Snapper also increased but the catch rates of most of the bycatch species decreased.

The effect of gill nets on catch composition can be significant, influencing both the types of fish caught and the overall health of marine ecosystems. The gill net is designed to target specific species of fish (Lucchetti *et al*., 2020). It can lead to a more homogeneous catch, as the nets are often set in areas where certain species are known to congregate such as near the bottom of the ocean or in shallow waters. Pouladi *et al*. (2020) noted a significant impact the mesh size of gill nets had on the catch composition. The findings reveal that species such as *Scomberomorus commerson*, *Thunnus. tonggol*, and *Euthynnus affinis* were the main species caught using 130 mm gill nets, which yielded a higher catch than 140 mm and 150 mm gill nets. This observation was attributed to the mesh size, which had a significant effect on the abundance, number and diversity of caught species. Specifically, larger mesh sizes resulted in lower abundance and diversity compared with smaller mesh sizes. These results underscore the importance of considering the mesh size of gill nets.

In contrast, collapsible crab traps are designed to catch bottom species, particularly crustaceans like crabs, and are easily collapsible for easy transport and deployment. These traps are normally used by artisanal fishers and are typically set on the seabed. The traps are baited to attract the target species, which enter the trap through the openings and cannot escape due to the collapsible design (Vadziutsina & Riera, 2020). Bycatch of non-target species are minimised,d reducing the environmental impact compared with other fishing methods (Petetta *et al*., 2021).

Even though prior studies have provided evidence of differences in catch composition and volume in other countries, to the best of the researchers' knowledge, no such study has been conducted in Malaysia. Hence, this study examined the impact of artisanal fishing gear on catch composition and volume, and the relative abundance of species along the East Coast of Peninsular Malaysia. This study hopes to provide valuable insights to support the development of more effective fisheries management strategies in the region.

Materials and Methods

Study Area

This study was conducted at selected fish landing ports in the East Coast of Peninsular Malaysia states of Kelantan, Terengganu, and Pahang (Figure 1). These states, facing the South China Sea, were selected as the study area due to the relatively high number of artisanal fishers and the use of various types of fishing gear by the fishers in the states.

Data Collection

Data for this study were collected via face-to-face interviews with the leaders or owners of artisanal fishing vessels in zone A, accompanied by a questionnaire, from October 2023 to May 2024. Fishermen were selected through random sampling, to give each individual an equal chance of being chosen. The questionnaire was adapted from those published in several previous studies, including Lili (2019), Putri and Wulandari (2020) and Abd Hamid *et al*. (2022). The questions included the participant's socio-economic status and fishing activities. The sample size was determined based on Slovin's formula, which was also used by Rafiola *et al*. (2020). According to the Department of Fisheries Malaysia records, there were 4,534 artisanal fishers on the East Coast of Peninsular Malaysia in 2022: 918 in Pahang, 2,431 in Terengganu, and 1,185 in Kelantan. Using a 6% margin of error, the minimum number of participants should be 262. Based on the proportionate sampling technique, the number of respondents to be selected in each state was 53 in Pahang, 140 in Terengganu, and 69 in Kelantan. However, since face-to-face interviews have multiple risks, including incomplete forms, the researchers decided to increase the number of participants to 300.

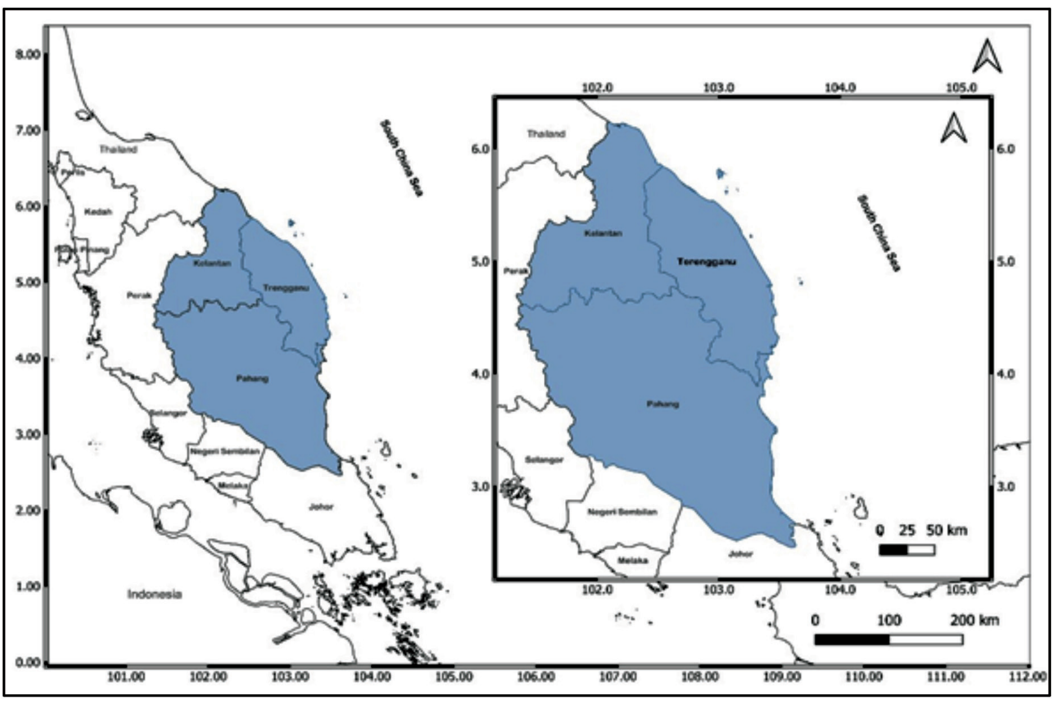

Figure 1: Study area in the East Coast of Peninsular Malaysia

Data Analysis

Descriptive analysis was used to analyse the catch composition and volume, and the relative abundance of species for the different types of fishing gear. This approach was also used by Yonas Derebe *et al*. (2023) and Hidayati and Mohamad (2024). Despite its simplicity, descriptive analysis helps in understanding the distribution of catch composition and identifying patterns or trends in data (Loeb *et al*., 2017). Before conducting the descriptive analysis, the researchers calculated the relative abundance of species using the relative abundance formula [Equation (1)].

$$\textit{Relative abundance}\ \% = \left(\frac{ni}{N}\right) \times 100 \qquad (1)$$

where:

ni = The number of individual fish of a particular species caught

N = The total number of individual fish caught

Results and Discussion

Types and Characteristics of the Fishing Gear Used

After data cleaning, responses from 294 participants were found to be valid for further analysis. Table 1 shows the characteristics of the fishing gear used by the fishers, comprising gill nets, hook and line, and traps. In terms of length, 78.1% gill nets are longer than 100 m. In contrast, the hook and line gear is almost exclusively shorter, with 98.3% measuring 100 m or less. All of the traps were 100 m or less in length. Regarding width, 87.7% of the gill nets were 5 m or narrower. Traps similarly tend to be compact, with 93.4% measuring 5 m or less in width. For height, almost all traps are 5 m or shorter (91.5%). Mesh size also varies, with 73.9% of the gill nets having a mesh size of 2 inches or less. Similarly, 80.9% of traps have mesh sizes of 2 inches or less. For the hook and line gear, the focus shifts to the number of hooks, where 60.0% use 10 or fewer hooks.

Operational Aspects of the Fishing Gear Used

Table 2 shows the operational aspects of the different types of fishing gear used on the East Coast of Peninsular Malaysia comprising gill net, hook and line, and trap. The analysis provides insights into the distance of fishing areas, water depth, working hours, and frequency of trips. Gill nets are predominantly used close to shore (≤ 10 NM, 79.14%) and at intermediate depths (11–20 m, 45.45%), with most operations lasting 6–10 hours (48.66%) and involving frequent trips (51.87% exceed 21 trips per month). Hook and line fishing is more varied in distance, with notable activity in waters ≥ 21 NM (38.33%) and depths ≥ 41 m (25%). It also involves

Table 1: Types and characteristics of the fishing gear used by fishers

Characteristics			Types of Fishing Gear					
			Gill Net		Hook and Line		Trap	
			n	%	n	%	n	%
Total length (m)		≤ 100	41	21.9	59	98.3	47	100.0
		> 100	146	78.1	1	1.7	-	-
Width (m)		≤ 5	164	87.7	-	-	44	93.4
		> 5	23	12.3	-	-	3	6.4
Height (m)		≤ 5	-	-	-	-	43	91.5
		> 5	-	-	-	-	4	8.5
Size	Mesh (in)	≤ 2	138	73.9	-	-	38	80.9
		> 2	49	26.2	-	-	9	19.1
	Hook (N°)	≤ 10	-	-	36	60.0	-	-
		> 10	-	-	24	40.0	-	-
			n = 187		*n* = 60		*n* = 47	

Table 2: Operational aspects of fishing by fishers

Characteristics		Types of Fishing Gear					
		Gill Net		Hook and Line		Trap	
		n	%	n	%	n	%
Distance (NM)	≤ 10	148	79.1	20	33.3	18	38.8
	11–20	37	19.8	17	28.3	16	34.0
	≥ 21	2	1.1	23	38.3	13	27.7
Depth (m)	≤ 10	37	19.8	14	23.3	4	8.5
	11–20	85	45.5	16	26.7	24	51.1
	21–30	39	20.9	8	13.3	13	27.7
	31–40	10	5.4	7	11.7	6	12.8
	≥ 41	6	3.2	15	25.0	-	-
Working (hour)	≤ 5	41	21.9	2	3.3	7	14.9
	6–10	91	48.7	22	36.7	12	25.5
	10–20	16	8.6	21	35.0	4	8.5
	≥ 21	39	20.9	15	25.0	24	51.1
Number of trips per month	≤ 10	1	0.5	16	26.7	28	59.6
	11–20	89	47.6	22	36.7	14	29.8
	≤ 21	97	51.9	22	36.7	5	10.6
		n = 187		*n* = 60		*n* = 47	

moderate to long working hours (36.67% for 6–10 hours and 35% for 10–20 hours). Trap fishing is concentrated nearshore (38.8%, ≤ 10 NM) but also occurs at 11–20 NM (34.04%), with depths of 11–20 m (51.06%). This method requires longer hours (51.06%, ≥ 21 hours) and tends to involve fewer monthly trips (59.57%, ≤ 10 trips). Overall, the data indicates that gill netters operate closer to shore with shorter working hours and high trip frequencies, hook and line vessels tend to fish at long distances and depths with moderate working hours, and trap vessels operate for the longest hours but with fewer trips. These findings reflect the distinct operational strategies used for each gear type.

Catch Composition, Volume of Catch, and Relative Abundance of Species

The catch composition, volume of catch, and relative abundance of species caught using various types of fishing gear (gill net, hook and line, and trap) are shown in Table 3. The 294 artisanal fishers on the East Coast of Peninsular Malaysia caught a total of 45 species. Gill nets had the highest catch composition with 37 species, followed by traps with 26 species, and hooks and lines with 23 species. Gill nets, hooks and lines, and traps display distinct species profiles in their catches, reflecting their effectiveness for specific groups of marine

Table 3: Catch composition, volume of catch, and relative abundance of species by fishing gear

Species	Gill Net		Hook and Line		Trap		Total
	Vc	Ra	Vc	Ra	Vc	Ra	
Indian threadfish	4	0.04	-	-	-	-	4
African pompano	30	0.28	114	2.00	17	0.20	161
Oxeye scad	75	0.69	25	0.44	-	-	100
Blackfin scad	145	1.33	5	0.09	20	0.23	170
Round scad	1,057	9.71	375	6.56	10	0.12	1,442
Yellow-tail scad	1,039	9.54	142	2.49	47	0.54	1,228

Yellow-banded scad	835	7.67	343	6.00	31	0.36	1,209
Double-spotted queenfish	10	0.09	-	-	-	-	10
Torpedo scad	239	2.20	140	2.45	35	0.40	414
Bludger trevally	-	-	-	-	5	0.06	5
Black pomfret	232	2.13	5	0.09	-	-	237
Eastern little tuna	262	2.41	1,492	26.12	-	-	1,754
Longtail tuna	44	0.40	122	2.14	4	0.05	170
Indian mackerel	2,700	24.80	308	5.39	79	0.91	3,087
Chub mackerel	400	3.67	-	-	-	-	400
Narrow-barred Spanish mackerel	30	0.28	418	7.32	-	-	448
Two-spot red snapper	-	-	10	0.18	72	0.83	82
Brownstripe red snapper	83	0.76	20	0.35	158	1.83	261
Red snapper	-	-	17	0.30	175	2.02	192
John's snapper	5	0.05	45	0.79	258	2.98	308
Bigeye snapper	33	0.30	-	-	-	-	33
Engraved catfish	148	1.36	-	-	-	-	148
Smoothbelly sardinella	110	1.01	10	0.18	-	-	120
Soldier croaker	435	4.00	-	-	20	0.23	455
Painted sweeplips	-	-	-	-	114	1.32	114
Saddle grunt	41	0.38	-	-	87	1.01	128
Lattice monocle bream	10	0.09	-	-	30	0.35	40
Japanese threadfin bream	1,251	11.49	351	6.14	5,625	65.02	7,227
Fourfinger threadfin	28	0.26	-	-	-	-	28
Tardoore	203	1.86	-	-	-	-	203
Orange-spotted grouper	50	0.46	209	3.66	1,044	12.07	1,303
Spotted grouper	-	-	-	-	58	0.67	58
White-spotted spinefoot	-	-	-	-	18	0.21	18
Redbelly yellowtail fusilier	-	-	-	-	2	0.02	2
Dorab wolf-herring	199	1.83	14	0.25	23	0.27	236
Indian spiny turbot	25	0.23	-	-	-	-	25
Largehead hairtail	29	0.27	-	-	-	-	29
Grey bamboo shark	15	0.14	-	-	-	-	15
Dwarf whipray	104	0.96	-	-	-	-	104
Whitespotted whipray	25	0.23	-	-	-	-	25
White shrimp	398	3.66	-	-	-	-	398
Pink shrimp	104	0.96	-	-	-	-	104
Blue swimming crab	323	2.97	-	-	204	2.36	527
Squid	165	1.52	1,542	26.99	495	5.72	2,202
Bigfin reef squid	-	-	6	0.11	20	0.23	26
Total (kg)	**10,886**	**100%**	**5,713**	**100%**	**8,651**	**100%**	**25,250**

Notes: Vc = Volume of catch (kg/trip); Ra = Relative abundance (%)

organisms. In terms of catch volume, gill nets led (10,886 kg), followed by hooks and lines (5,713 kg), and traps (8,651 kg).

Gill nets seem to be the most effective for capturing pelagic and semi-pelagic fish, particularly scad, mackerel, and bream. This may be explained by the fact that gill nets hang vertically in the water column, allowing them to intercept fish that swim through or near the net. Pelagic and semi-pelagic fish, which spend part of their lives in open waters, are more likely to encounter these vertical barriers (Fishing gear: Gill nets) (NOAA Fisheries, 2019). These fish species often swim in schools and follow predictable migration patterns, making them more likely to encounter stationary gill nets. Their schooling behaviour increases the likelihood of multiple fish being caught at once. The finding is aligned with previous studies by Hidayati and Mohamad (2024) and Wan Azimi *et al.* (2025), which report that pelagic species (mackerel tuna and round scad) were the dominant fish caught using gill nets.

In the context of relative abundance, gill nets are highly effective in capturing a wide range of species, as shown in Table 3. The main species caught using gill nets are Indian mackerel (2,700 kg, 24.80%) and Japanese threadfin bream (1,251 kg, 11.49%). Other notable species include yellow-tail scad (9.54%), round scad (9.71%), and yellow-banded scad (7.67%). Species like soldier croaker (3.99%), chub mackerel (3.67%), and squid (1.51%) were present but at lower relative abundance. Rarely caught species, such as grey bamboo shark (0.14%) and Indian spiny turbot (0.23%), were observed in small quantities. This finding is consistent with Koya *et al.* (2018), which highlight that non-target or rare species occur at very low percentages in catches, reflecting incidental bycatch rather than targeted harvest.

This finding can be explained by the fact that gill nets are designed with mesh sizes tailored to the size of the target fish (Prchalová *et al.*, 2009). Pelagic and semi-pelagic fish, which often have streamlined bodies, can easily swim into the net, and their gills get caught as they try to back out. This design is less effective for demersal (bottom-dwelling) species. More interestingly, gill nets are designed to be less visible underwater, further increasing their effectiveness (Hanamseth *et al.*, 2017). In addition, pelagic species like mackerel and sardine are attracted to surface or near-surface waters where plankton or smaller fish are abundant (Domínguez-Contreras *et al.*, 2012), thus increasing their exposure to gill nets.

This finding is supported by Thomas and Hridayanathan (2003), which found 19% of the total catch was caught using gill nets with various mesh sizes. The species' schooling behaviour makes it easier to capture them in large quantities using gill nets. In addition, plankton is the main food source for mackerel. During the monsoon season in this region, nutrient-rich waters promote plankton growth, providing ideal conditions for the species' growth and reproduction (Kamaruzzaman *et al.*, 2021). In sum, gill nets are one of the most effective fishing gears for catching Indian mackerel due to their ability to capture mid-water schooling species (Thomas, 2019).

Hook and line fishing, particularly effective for tunas and squids, shows a different profile (Table 3). The eastern little tuna (26.12%) was the most abundant species caught by this fishing gear, constituting over a quarter of the total catch. Tuna species are often targeted using hooks and lines due to their behaviour and habitat. Squids (26.99%) were similarly significant, indicating that the hook and line method (squid jigging) also attracts invertebrates. Narrow-barred Spanish mackerel (7.32%) and round scad (6.56%) were other key contributors. Japanese threadfin bream (6.14%) remained prominent for this method, though with lower relative abundance compared to gill net catches. Species like torpedo scads (2.45%) and longtail tuna (2.14%) contributed moderate percentages. Less common species included the blackfin scads (0.09%) and black pomfret (0.09%). In other words, hook and line fishing showed particular effectiveness for larger pelagic fish, tunas and squids.

Hook and line techniques utilise hooks attached to lines for the targeted capture of various species (Manoharadoss, 2002). The hook and line fishing methods, including hook line, long line, and squid jigging, are designed to mimic the appearance and movement of prey such as small fish or prawns (Solomon & Ahmed, 2016). Jigging is equipped with multiple small hooks or "crown hooks" that easily entangle squid tentacles and provide a strong hold. Additionally, squids respond well to hook size and the varied retrieval techniques that can be used with hook and line such as vertical jigging or casting and reeling (Kusuma *et al*., 2022). Also, more hooks allow fishers to set bait at various depths, thereby increasing the likelihood of encountering fish at different levels of the water column (Monnahan & Stewart, 2018). This method is especially useful in situations where fish are not evenly distributed.

Eastern little tuna is commonly caught using hook and line methods due to a combination of their behavioural traits, ecological preferences and bait attraction. They are active, fast-swimming pelagic predators that feed primarily on small fish, crustaceans, and cephalopods (Artetxe-Arrate *et al*., 2021). They are highly responsive to live bait or artificial lures, especially those that mimic natural feeding scenarios (Horne, 2024). Fast-swimming fish are typically predatory and aggressive feeders, quickly striking at moving targets that resemble their prey (Huntingford, 2020; Kusmedy *et al*., 2020). In other words, the dynamic motion of bait or lure presented by the hook and line gear mimics the erratic swimming of prey, triggering the predatory instincts of fast-swimming fish. Their aggressive feeding response often results in a higher catch rate. This technique, which involves dragging baited hooks or lures behind a moving boat, aligns perfectly with tuna's pelagic lifestyle and swimming pattern.

Meanwhile, Japanese threadfin bream (65.02%) dominated the trap catch, contributing more than half of the total trap yield (see Table 3). This finding suggests that this species is particularly susceptible to trapping gear. Orange spotted grouper (12.07%) was the second most significant species, reflecting the trap's effectiveness for groupers. Squids (5.72%) also featured prominently, indicating that traps also attract invertebrates. Species such as blue swimming crab (2.36%), john's snapper (2.98%), and red snapper (2.02%) also showed reasonable abundance. Species like spotted grouper (0.67%) and redbelly yellowtail fusilier (0.02%) were observed in smaller quantities.

These findings can be attributed to the effectiveness of fishing traps in catching demersal species (Vadziutsina *et al*., 2021), such as grouper, snapper and Japanese threadfin bream, which tend to remain near the seabed. They often move within a specific area, making them more likely to encounter and become trapped in stationary traps. Unlike trawl nets or other active fishing methods, traps are more selective and less invasive. These characteristics help reduce bycatch, targeting only the species that are attracted to the bait within the traps (Vadziutsina *et al*., 2020).

Since fishing traps often use bait, demersal fish are more likely to be caught in traps due to their behaviour of scavenging or searching for food on the seabed (Butcher *et al*., 2012). The trap's design allows the fish to enter, but once inside the structure prevents them from escaping (Tran *et al*., 2020). Many demersal fish species inhabit rocky or reef areas (Vadziutsina *et al*., 2021). These areas are where traps can be placed and camouflaged to blend with the environment. The design of traps such as pots or cages, often fits well in such habitats, where other forms of fishing gear might be difficult to be used effectively.

Fishing traps are particularly effective for catching Japanese threadfin bream (*Nemipterus* sp.) due to a combination of the species' behavioural traits and habitat preferences, alongside the characteristics of the traps themselves. Japanese threadfin bream are demersal fish found in sandy and muddy substrates at depths ranging from 5 to 80 m (Ching, 2024) and fishing traps placed on the seabed are ideal for targeting this species

(Alamsah *et al*., 2019). Threadfin bream are opportunistic feeders that consume crustaceans, small fish, and other benthic organisms. Traps are designed to attract these fish using bait that mimics their natural prey (Derby *et al*., 2024), making them more likely to enter the traps. Furthermore, the species is known to form small schools, thus increasing the likelihood of catching them in high quantities in a single trap deployment. This behaviour makes traps highly efficient for catching Japanese threadfin bream without damaging the quality of the fish, resulting in a higher market value and profitability (Sogn-Grundvåg *et al*., 2021).

Overall, the results revealed that Japanese threadfin bream (7,227 kg) was the most abundantly trapped species, followed by Indian mackerel (3,087 kg) and squid (2,202 kg). The Japanese threadfin bream is a demersal species commonly found in coastal waters at depths ranging from 5 to 80 m over sandy and muddy substrates (Wora *et al*., 2024), making the coastal areas of Peninsular Malaysia its ideal habitat. This species is known to form large schools and has a fast growth rate, resulting in high catch volumes and profitability for local fishers. Its adaptability and abundance make it a primary target for both commercial and artisanal fisheries throughout its range (Russell, 1990). Other than that, Japanese threadfin bream, Indian mackerel, and squid are highly sought-after species in both local and export markets. This rising demand not only promotes sustainable fishing practices but also ensures consistent economic returns for artisanal fishers engaged in their capture.

Conclusions

Gill net, hook and line, and trap are the artisanal fishing gear used along the East Coast of Peninsular Malaysia. These different types of fishing gear exhibit distinct effectiveness, influenced by their design and operational characteristics, for specific groups of species. Overall, 45 fish species were recorded by 294 artisanal fishers in the East Coast of Peninsular Malaysia. Gill nets yielded the highest catch composition (37 species), followed by traps (26 species) and the hook and line method (23 species). By species, Japanese threadfin bream (7,227 kg) accounted for the highest catch volume, followed by Indian mackerel (3,087 kg) and squid (2,202 kg).

Overall, gill nets yielded the highest catch (10,886 kg), followed by traps (8,651 kg) and the hook and line method (5,713 kg). While this research provides valuable insights on catch composition and volume, and relative abundance by species, there are limitations. Since data collection was based on average catch a year per trip without distinguishing between seasons, the study did not capture the seasonal variations in fish catch and income. Seasonal factors such as monsoons, fish migration patterns, and changes in sea conditions can significantly influence catch composition and fishing activities, affecting the reliability of the findings.

Thus, the study recommends that future research consider integrating other factors, including economic, social, and environment aspects. In addition, other regions of Malaysia such as the West Coast of Peninsular Malaysia and East Malaysia, should be included to enable comparisons of catch composition and volume, and the relative abundance of species among artisanal fishers across different regions. These studies suggest that fisheries management policies should emphasise gear selectivity and responsible fishing practices to ensure sustainable resource utilisation. Regulatory authorities such as the Department of Fisheries Malaysia, could strengthen the implementation of mesh size regulations, gear restrictions, and the monitoring of fishing practices to reduce the capture of juvenile and non-target species.

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Author Contributions Statement

Wan Mohamad Aiman Wan Azimi carried out the research, and wrote and revised the article; Rumeaida Mat Piah and Fadzliee Asmat anchored the review and revised the manuscript; Abdullah Mohamad supervised research progress, revisions, and approved the article submission.

Conflict of Interest Statement

The authors agree that this research was conducted in the absence of any self-benefits, commercial or financial conflicts and declare absence of conflicting interests with the funders.

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