



World News of Natural Sciences

An International Scientific Journal

WNOFNS 41 (2022) 85-97

EISSN 2543-5426

Construction of Traps (*Krendet*) as traditional fishing gear of Lobster (*Panulirus* sp.) in Pangandaran Regency, Indonesia

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ABSTRACT

The fishing gear used by the majority of fishermen on Madasari Beach, Pangandaran Regency, Indonesia is the *krendet* as known as fishing traps. *Krendet* is a passive fishing gear and is classified as trap *net a* selective because the lobster caught is legal size of lobster, which is above 200 grams. *Krendet* has a construction of a frame, net, bait line, towing line and ballast. One of the commodities is lobster (*Panulirus* sp.). Lobster catching permits have been regulated in the Minister of Maritime Affairs and Fisheries Regulation No. 17 of 2021, its stated regarding permitted lobster catching with carapace lengths above 6 cm or weight above 150 grams per head for sand lobster (*Panulirus homarus*). This study aims to determine the construction of the fishing gear *krendet* used by the fishermen of Madasari Beach, Pangandaran Regency. Based on observations that the webbing is made of PA monofilament with 3.5 inches mesh size. The Frame is made of iron in the form of a circle with a diameter of ± 60 cm. The ballast used was made of stone with a weight of ± 1.5 kg. The traps (*krendet*) also consist towing rope and a float rope. The tow rope is made of monofilament with a size of 3-4 mm diameters and a length of 15-30 m, while the float rope is made of polyethylene (PE) with a size of 1.5 mm and a length of about ± 60 cm.

Keywords: Fishing gear construction, lobster, Pangandaran, trap, *Krendet*, *Panulirus homarus*

1. INTRODUCTION

One of Indonesia fishery commodities is lobster (*Panulirus* sp.) or crayfish. According to the Department of Maritime Affairs, Fisheries and Food Security (DKPKP) of Pangandaran Regency (2020), the production of lobster in Pangandaran Regency in 2018-2019 is 6,561.99 kg and 7,251 kg, respectively. This shows that Pangandaran has a relatively high lobster potential compared to other types of shrimp commodities (DKPKP 2020). This commodity is superior because it has a high economic selling value in local and international trade (Asvin *et al.* 2019). This is because lobster meat has a smooth meat texture and a savory and delicious taste compared to other types of shrimp, this is one of the consumer preference (Mubin *et al.* 2013). Lobster prices are determined by type and size. The high selling value of lobster is a lobster that is still alive, it has complete organs are not damaged. The high economic value of lobster is a motivating factor for fishermen to take advantage of it. This means that if the number of catches is small but the quality is good, fishermen will still get a high income (Jayan *et al.* 2015).

Madasari Beach in Pangandaran Regency has filled with coral rocks and is the main location that has potential for lobster catches (*Panulirus* sp.). This can be seen from the lobster production data at Fish Auction Place (TPI) Madasari which is the largest compared to other TPIs in 2018-2019, respectively (1,784.78 kg and 2,150.56 kg). One of the efforts to maintain the quality of catches is the use of good fishing gear without injuring the lobster's limbs (Khikmawati *et al.* 2015).

The fishing gear used by fishermen to catch lobster are mini bottom trawl, *gill nets*, and *trap nets*. One of the type fishing gear *trap net* used by the majority of Madasari fishermen is *krendet* (local name). *Krendet* is a fishing gear that considers the sustainability of fishery resources. This gear categorized as environmentally friendly fishing gear in accordance with the *CCRF (Code of Conduct for Responsible Fisheries)* (Zulkarnain *et al.* 2011). According to Firdaus *et al.* (2017) based on *CCRF* that the criteria for a good fishing gear are having a high enough selectivity, not causing damage to the habitat as a habitat for fish and as a habitat for other organisms, producing high quality fish, not endangering fishermen, safe products for consumers, *bycatch* low, low impact on biodiversity, no catch or harm protected fish [10-32].

Krendet is a passive fishing gear and is classified as *trap net*. Its selective gear because the lobster caught is an legal size lobster, which is above 200 grams (Rombe *et al.* 2018). This is in accordance with the Regulation of the Minister of Maritime Affairs and Fisheries Number 17 of 2021, namely regarding the permitted catching of lobsters with sizes above 150 grams (KKP 2020). Therefore, it is necessary to know about the construction of *krendet* to catch lobster at Madasari Beach, Pangandaran Regency.

2. EXPERIMENTAL / RESULT

The method used in this study is a descriptive method. This method used to describe and elaborate of the construction of the fishing gear including the body of the net (*webbing*), frame (*frame*), rope (*rope*), ballast. Types of data in this study using primary data and secondary data. Primary data is obtained directly from the source. This data was not previously available, because research had never been done or the results of research that had expired, then had to find and collect data independently (Kusuma *et al.* 2012). This data is the result of observation,

participation, interviews and documentation during the research. Primary data were obtained directly from activities in the field located in Masawah Village, Cimerak District, Pangandaran Regency. Secondary data was obtained from documents contained in the Musawah Village Office and the Department of Marine Fisheries and Food Security (DKPKP), such as lobster production data (*Panulirus* sp.) in 2013-2021, geographical location, and data from other sources, namely journals and books.

2. 1. Definition



Figure 1. Capture Device *Krendet*
(Source: Field Documentation 2021)



Figure 2. Construction of the *Krendet*
(Source: Field Documentation 2021)

Krendet is a passive fishing gear and is classified as a trap consisting of a frame, net, tow rope, bait rope, ballast and bait, but some use a sign buoy or known as *umbul-umbul* (flag) made of styrofoam. Fishermen *Krendet* who catch lobsters do not use a fleet. Fishermen at Madasari Beach take advantage of sea conditions filled with rocks and cliffs to operate fishing gear. This fishing gear includes traditional fishing gear that is still actively used by fishermen to catch lobster at Madasari Beach.

The shape of the fishing gear is simple and easy to make. *Krendet* is made of a circular iron frame tied with rope, but some are cast. The middle part of the net is installed and then there is a bait line. *Krendet* are placed on the sidelines of the rocks, in the middle of the waters hit by big waves, and the bottom of the waters. The principle of catching *krendet* is to attract the attention of lobsters that enter the net using bait tools, so that the lobsters will bounce and

cannot move freely. Sightings of fishing gear form *krendet* already assembled can be seen in Figure 1.

2. 2. Construction

Krendet operated in Madasari Beach, Pangandaran, Indonesia consisting of a framework, nets, bait lines, tow lines, and weights. The following is the construction of the fishing gear, *krendet* which can be seen in Figure 2.

1) Frame

Frame of the fishing gear used by Madasari Beach fishermen is made of iron. The framework used is made from materials that are easily available, inexpensive, and easy to shape. The size of the iron used has a diameter of 4 mm in the form of a circle with a diameter of ± 60 cm. The following is the construction of the frame, *krendel* which can be seen in Table 1.

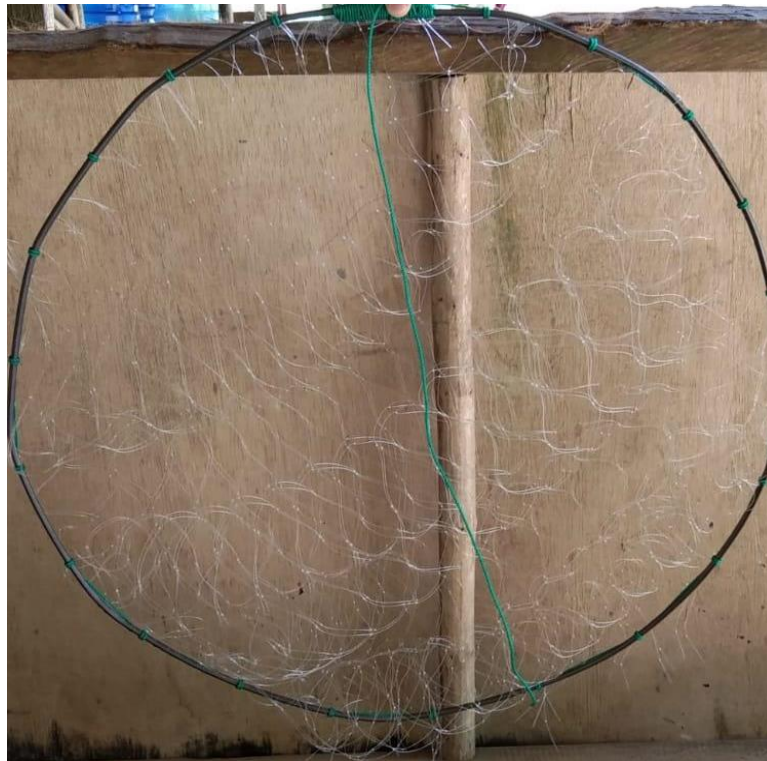


Figure 3. Iron Framework *Krendet*
(Source: Field Documentation 2021)

Table 1. Construction of Frame

Type	Description
Material	Iron

Shape	Circle
Diameter (mm)	4
Length (cm)	200
Diameter (cm)	±60

(Source: Primary Data)

Krendet can be used as much as three to seven times the operation, because of the nature of iron which is easy to corrode when immersed in sea water, so it is not suitable for use anymore. The following is the form of the framework, *credit* which can be seen in Figure 3.

2) Nets (*webbing*)

The nets made of *monofilament polyamide* (PA) with a thread number of 40 and 3.5 inches mesh size. The principle of the net is to make the lobster bounce. The installation of the net on the frame consists of two layers and is not too tight, so that the snare is better. Two layers of nets can be used to catch lobsters a minimum of three operations and a maximum of seven operations must be replaced due to sea waves. The following construction of nets *krendet* can be seen in Table 2.

Replacement of the net based on the condition of the net after operation, if it is not suitable for use then replaced with a new condition. The following is the shape of the fishing gear *krendet* as seen in Figure 4.



Figure 4. Construction of the net
(Source: Field Documentation 2021)

Table 2. Construction of Krendet Nets

Type	Description
Material	<i>Monofilament polyamide (PA)</i>
Knot type	<i>English knot</i>
Color	Transparent
<i>Mesh size (inch)</i>	3.50
<i>Mesh stretched (inch)</i>	4.40

(Source: Primary Data)

3) Ballast

Used on the *krendet* is made of stone which is found around the edge of the house or the beach. If the weight is ± 1.5 kg, then one per *Krendet* is enough, but if the weight is less than ± 1.5 kg, then two per *Krendet*. The following ballast construction can be seen in Table 3.



Figure 5. Weights

(Source: Field Documentation 2021)

The ballast serves to sink the bottom of the net so that the entire frame *krendet* sink to the bottom of water. The weights provide a downward force on the net so that the net can be upright and not carried away by the waves during operation. The following forms of ballast on the fishing *krendet* gear can be seen in Figure 5.

Table 3. Construction Ballast

Type	Description
Material	Stone
Shape (kg)	Irregular
Weight (kg)	± 1.50 kg
Quantity/fishing gear	1

(Source: Primary Data)

4) Towing

Rope The towing rope is made of material monofilament with a size of 3-4 mm. The length of the rope is 15-30 m depending on the depth of the sea and the length of the rock with the spinning direction to the left. *Krendet* that has sunk to the bottom of the sea, the tow rope will be tied to rocks or large rocks as a pedestal. The following construction of rope monofilament can be seen in Table 4.



Figure 6. Towing Rope
(Source: Field Documentation 2021)

Table 4. Construction Towing Rope.

Type	Description
Material	<i>Mono fillament Spinning</i>
Direction	<i>Z</i>
Length (m)	15-30

Size (mm)	3-4
Color	gray

(Source: Primary Data)

This rope is also used as a heavy tie rope and connecting rope. This rope has good resistance, both in rainy and hot conditions. The following is the towing rope *krendet* which can be seen in Figure 6.

5) Bait Rope

The bait line is made of polyethylene (PE) with a size of 1.5 mm. The length of the rope is about ± 60 cm or size of the diameter according to the render. The bait line is attached to the center of the rope frame, which has good resistance in rainy and hot conditions. The following is the construction of the bait line can be seen in Table 5.

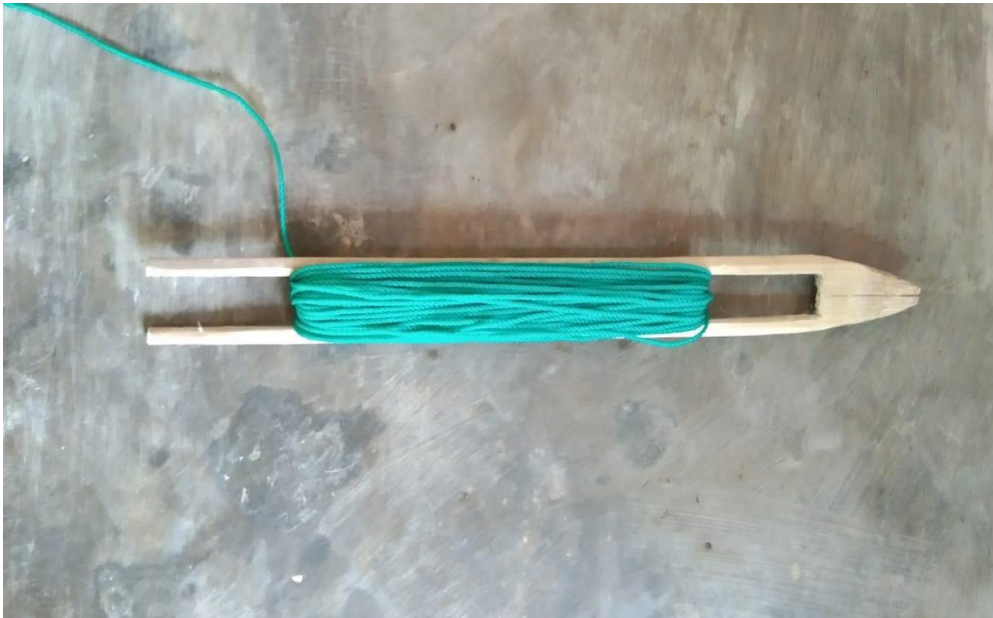


Figure 7. Bait Rope
(Source: Field Documentation 2021)

Table 5. Bait Rope Construction

Type	Description
Material	<i>Polyethylene (PE)</i>
Spinning direction	<i>Z</i>

Length (cm)	60
Size (mm)	1.5
Color	green

(Source: Primary Data)

The bait is attached by tying it with a bait line to the body of the net. This rope is also used as a rope to tie the net to the frame *krendet*. This rope has good resistance in rainy and hot conditions. The following shape of the bait line can be seen in Figure 7.

3. CONCLUSIONS

The construction *krendet* consists of a web body (*webbing*), framework, rope, sign buoys and ballast. The parts of the *krendet*, namely the webbing, are made of PA monofilament transparent with 3.5 inches mesh size, which serves to trap lobsters and places for baiting and the color of the net is not easily visible to the target organisms. The frame *is made* of iron in the form of a circle with a diameter of ± 60 cm which functions as a house made of nets. The ballast used is made of stone with a weight of ± 1.5 kg. Next there is a towing rope and a float rope. The tow rope is made of *mono-filament* with a size of 3-4 mm and a length of 15-30 m, while the float rope is made of polyethylene (PE) with a size of 1.5 mm and a length of about ± 60 cm.

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