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The Construction Design of Octopus Fishing Gear Operated by Fisherman in Ende Waters, East Nusa Tenggara Province, Indonesia

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ABSTRACT

The purpose of this research was to determine the main variables related to the construction of octopus fishing gear operated by fishermen in Ende Waters, East Nusa Tenggara Province. The method used in this research is descriptive method. Data collection techniques used observation and interview techniques. The results of the study found that the fishing gear used in octopus fishing comes from the hand line group with a construction consisting of a fishing line reel, string, kili-kili and bait (artificial bait). The baits used are pocong-pocong, crab and artificial shrimp baits. The size of the string for pocong-pocong bait is No. 2000 and for crab and artificial shrimp bait No. 1000, then kili-kili with size No. 3-4. The bait used has its own construction, namely pocong-pocong bait resembling an octopus consisting of a head wrapped in dark-colored cloth, an iron hook connecting the string and kili-kili, a cloth cut to resemble tentacles from the head dressing, equipped with mines, then artificial crab bait has a construction consisting of a crab body equipped with a hook connecting the string and kili-kili, crab legs equipped with hook number 9 as many as 4 pieces, then kili-kili number 8 as many as 4 pieces and a spoon. As for artificial shrimp bait, it has a construction similar to the construction of crab bait, but the only difference is that the crab bait is located on the hook.

Key words: *Construction, Fishing Gear, Octopus, Ende*

Introduction

Octopus is one of the fishery resources that is a favorite export in Indonesia for nowadays (Bubun and Mahmud, 2019). Based on statistical data from Ministry of Marine Affairs and Fisheries (KKP) in 2021, it was recorded that the total production of octopus fisheries in Indonesia in 2020 was 55,913 tons with a production value of IDR 1.2 trillion. This production value comes from the largest contributing region, East Nusa Tenggara (19,102 tons), followed by Central Sulawesi (10,411 tons) and East Java (7,838 tons). In addition to the high amount of production, octopus is also one of the export commodities with quite competitive value, which based on data from the International Trade Centre (ITC) Trade Map shows that the volume of octopus exports throughout 2020 reached 17,752 tons with an export value of USD 68.5 million or equivalent to IDR 979.4 billion. The largest octopus export destinations in 2020 were China at 3,464 tons, Italy at 3,343 tons and America at 2,837 tons (Kenedi, 2022).

The largest contribution to supplying octopus production in East Nusa Tenggara Province comes from Ende District (Rosari, 2022). The potential value of octopus catch in Ende Regency in 2021 re-

corded a total catch of 10,907 octopus with a total weight of 16,315,440 kg with details of 4,504 females and 6,403 males. The economy in Ende Regency is supported by the potential value of octopus catches with a total income value in 2021 of IDR 487,257,800 (Rosari, 2022). In addition, a supporting factor for the increase in octopus production is that most people in Ende Regency have a livelihood as fishermen by utilizing various fishing technologies to obtain or catch fish and also other types of biota including octopus in local waters (Laka, 2017).

Yahyah *et al.* (2023) explained that one of the fishing technologies that contributes greatly to the acquisition of catches lies in the construction of fishing gear, the use of types of fishing gear and operating techniques. Until now, information has been obtained that the fishing gear used by fishermen in Ende Regency in octopus fishing operations is handline gear whose bait is modified in various specific forms in the term of the local community in the form of pocong-pocong, crabs and artificial shrimp. According to Manohas *et al.* (2017), Bubun and Mahmud (2019), octopus fishing gear is a modification of handline fishing gear with a traditional design and is only found in certain areas, so information on its construction is still very limited. Observing this, of course it must be studied through a research entitled Octopus Fishing Gear Construction Design and Operating Techniques in Ende Waters, East Nusa Tenggara Province, in order to obtain information to provide education to fishing communities and related agencies in efforts to manage fisheries, especially sustainable octopus resources.

Materials and Methods

Research Location. This research was conducted from April to May 2023 and took place in Arubara Village, Tetandara Village, South Ende Subdistrict, Ende Regency with the coordinates of S = 8°52'3.95" and E = 121°39'43.63". Arubara Village is located in the coastal area in the Ipi Bay area which faces the port of freight and passenger ships and the anchorage area of fishing boats. Around this area there are also residential areas with the majority of the population working as fishermen, most of whom are octopus catchers.

The fishing operation for octopus by local fishers depends on seasonal factors or wave conditions. When the waves and tides are relatively small, fishers tend to be active in fishing activities every day,

Fig. 1. General Condition of Research Location (Location of Data Collection)

but in unstable weather conditions or large waves and tides, only at certain times do fishers carry out fishing activities and some even do not carry out fishing activities at all (Yahyah *et al.,* 2022). In addition, for fishing trips, only one trip is made, namely fishermen start moving from the fishing base to the fishing area at 05.00 Wita in the morning and return at 12.00 Wita in the afternoon, the peak of fishing activity starts from September to March.

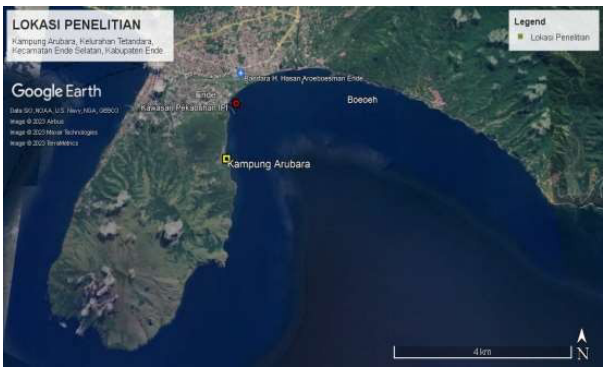

Fig 2. Map of Research Location

Data Collection Technique. This study used observation and interview techniques to collect data. The parameters observed were the construction of fishing gear, The number of respondents interviewed was 20 people. Determination of this respondent using purposive sampling technique. The data obtained were analyzed using qualitative descriptive analysis.

Results and Discussion

The results of observations and interviews with octopus fishermen obtained information that the fishing gear used to catch octopus by local fishermen is hand line gear using different types of artificial bait. The types of artificial bait can be in the form of pocong-pocong, artificial crabs or the local language is called kujo and artificial shrimp which the local language is called kura. The following can describe

the parts or construction of octopus fishing gear used by local fishermen.

String Winders

This fishing string winders is made of plastic which functions as a string winder. The winder also serves to facilitate the process of operating the fishing gear so that the rope is not tangled and can be rolled up after the fishing operation is complete and then stored for reuse at the time of operation (Tesen and Hutapea, 2020).

The Strings

The string used was made of monofilament. The string for crab bait and artificial shrimp is No. 1000. As for the pocong-pocong bait and its mines No. 2000. This string has a function to move the lure, disguise the bait and provide a sensation when tugging and pulling with the octopus. In addition, the function of this string or towing rope is also the main rope where the kili-kili, sinker, and also the fishing line and bait are tied (Mudzakir *et al.*, 2014).

Kili-Kili

The kili-kili is made of stainless steel, the size of the kili-kili used on artificial crab and shrimp bodies is number 3-4. These villi are placed on the top of the body or head of the rapala and the hands / claws of artificial crabs and shrimp. The function of the kili-kili at the top of the body / shell is as a connector between the bait and the string so that when pulling the bait into the canoe the string is not wrapped around. Kili-kili is also part of the hand line which is useful for connecting and for preventing the towline from being spun or tangled during the process of operating fishing gear (Purnomo *et al.*, 2014 in Tesen and Hutapea, 2020).

The Baits

The baits used by local fishermen are pocong-pocong, artificial crab and artificial shrimp (Manohas *et al.*, 2017 and Minggo *et al.*, 2023).

Images of the parts and overall construction of the octopus fishing gear used by fishermen in Arubara Village, Tetandara Village, South Ende District, Ende Regency are shown in Figures 3 and 4.

Regarding the use of the above types of artificial bait, including pocong-pocong, crab and shrimp, according to local fishermen, they were initially introduced and taught how to make and use them by fishermen from Nangahale, Sikka Regency. In 2007,

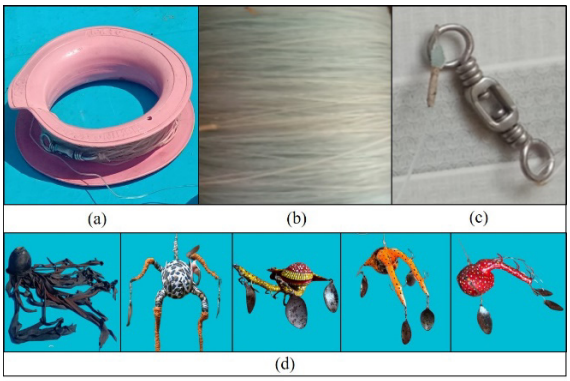

Fig. 3. The Parts and Overall Construction of The Octopus Fishing Gear Used by Fishermen in Arubara Village, Tetandara Village, South Ende District, Ende Regency: (a) String Winders, (b) The Winders, (c) Kili-Kili and (d) The Baits

local fishermen were introduced to pocong-pocong bait, then in 2007 artificial crab bait was introduced and in 2010 bait made from bautan shrimp was introduced. To date, octopus fishermen in the local area have become adept at designing these baits and using them in octopus fishing operations. These baits also have their own construction as described below:

Pocong-Pocong Baits

The construction of the pocong-pocong bait in octopus fishing operations by fishermen in Arubara Village, Tetandara Village, South Ende District, Ende Regency is made of medium-sized cement castings weighing approximately 1 kg wrapped in dark-colored cloth resembling an octopus head and the rest of the cloth is cut out so that it is formed to resemble the fingers/tentacles of an octopus with a length of approximately 35-45 cm. at the top of the cement castings, iron folds are placed connecting the strings and kili-kili. This bait is also equipped with a mine as an octopus hook that is attached to the bait. The mine is made of monel which is tied and attached to a number 6 hook of 4-6 pieces and equipped with a number 2 kili-kili of 1 piece as a connector.

The construction of pocong-pocong bait used by fishermen in Arubara Village, Tetandara Village, South Ende Subdistrict, Ende Regency based on the picture above is similar to the construction of pocong-pocong bait used by fishermen in several other areas as reported by several researchers such as Nurdiansyah *et al.* (2015) who reported the construction of pocong-pocong in Karimunjawa, Cen-

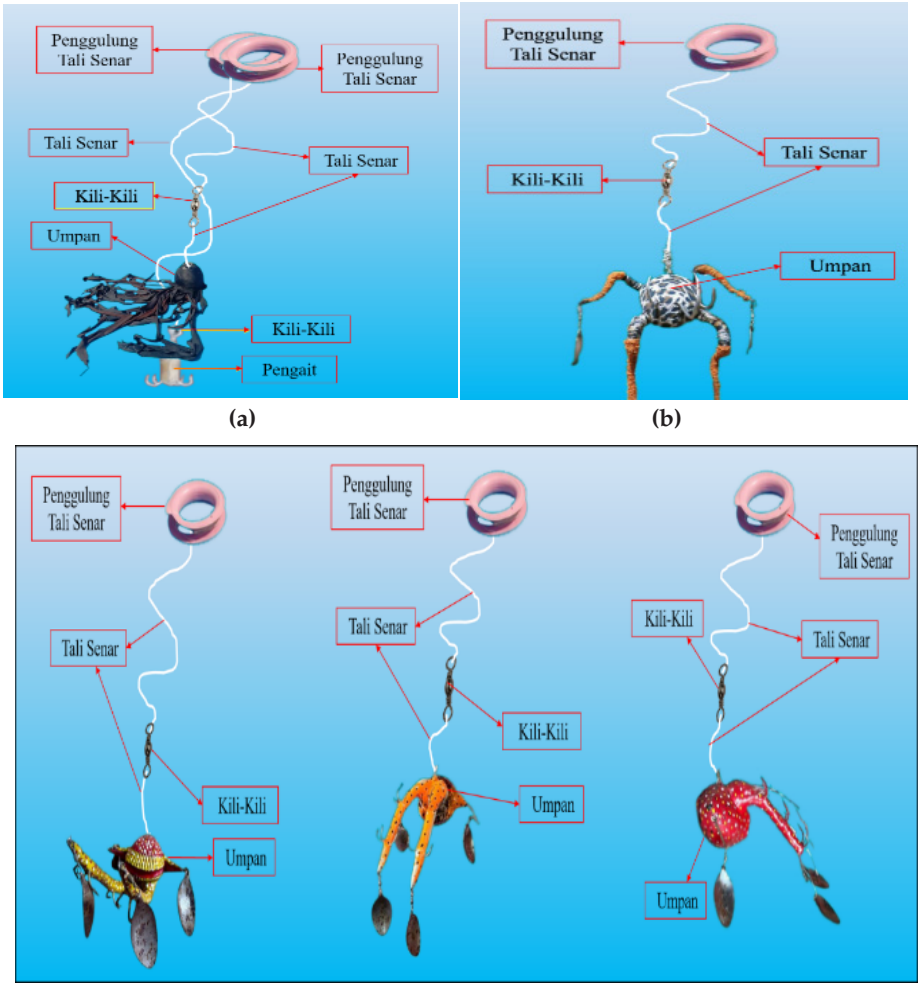

Fig. 4. Construction of Octopus Fishing Gear Used by Fishermen in Arubara Village, Tetandara Village, South Ende District, Ende Regency with Various Artificial Baits: (a) Bait Pocong-Pocong equipped with hooks / mines, (b) Artificial Crab Bait and (c) Artificial Shrimps Bait

tral Java, then Manohas *et al.*, (2017) who described the construction of pocong-pocong bait in octopus fishing, then Bubun and Mahmud (2019) who reported the construction of pocong-pocong used by fishermen in West Kabaena District, Southeast Sulawesi, as well as Kurniawan *et al.* (2019) who reported the construction of pocong-pocong bait by fishermen in Budo Village, Wori District, North Minahasa Regency, North Sulawesi Province. The

Fig. 5. Construction of Pocong-Pocong Bait

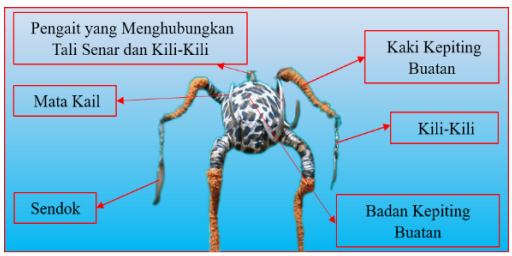

Fig 6. Construction of Artificial Crab Bait

same thing was also reported by Minggo *et al.* (2023) regarding the construction of pocong-pocong bait used by fishermen in Nangahale Village, Sikka Regency, East Nusa Tenggara Province in catching octopus.

Artifacial Crab Bait

Crab bait is one of the artificial baits used by fishermen in Arubara Village, Tetandara Village, South Ende District, Ende Regency. The construction of this is quite simple which is made to resemble a crab. The crab body is made of lead weighing 0.5 kg which is inserted into a crab body that has been designed using plastic base material and closed using glue and painted to resemble the color of the crab. On top of the crab body is equipped with a hook from the iron fold that connects the kili-kili and the string. In addition, the crab legs are made of iron wrapped with tin and covered with glue which is then painted according to the color of the crab legs. The construction of this bait is also equipped with a hook number 9 of 4 pieces, then kili-kili number 8 of 4 pieces which are used as hooks for spoons. The spoon used is a spoon cut to a size of 1-2 cm made of stainless material with a function as a rudder as well as to attract the attention of octopus.

The artificial crab bait used by fishermen in Arubara Village, Tetandara Village, South Ende Subdistrict, Ende Regency also has basically the same construction as other artificial crab baits operated by fishermen in octopus fishing operations in several areas in Indonesia. This is in line with what was found by several previous researchers such as Farikha *et al.* (2014) who reported the construction of artificial crab baits in octopus fishing in Baron Waters, Gunung Kidul, as well as Minggo *et al.* (2023) who reported the same construction of artificial crab baits in octopus fishing by fishermen in Nangahale Village, Sikka Regency, East Nusa Tenggara Province.

The Artificial Shrimp Bait

Artificial shrimp bait is an artificial bait that is also used by fishermen in Arubara Village, Tetandara Village, South Ende District, Ende Regency in the process of catching octopus. This bait also has a simple construction made to resemble shrimp which only consists of shrimp heads and legs. The shrimp head is made of tin weighing approximately 0.5 kg which is inserted into empty conch and clam shells such as spotted conch shells and blood clams which are closed using glue. In addition, the legs are made of iron wrapped with tin and covered with glue and then painted. Similar to artificial crab bait, this

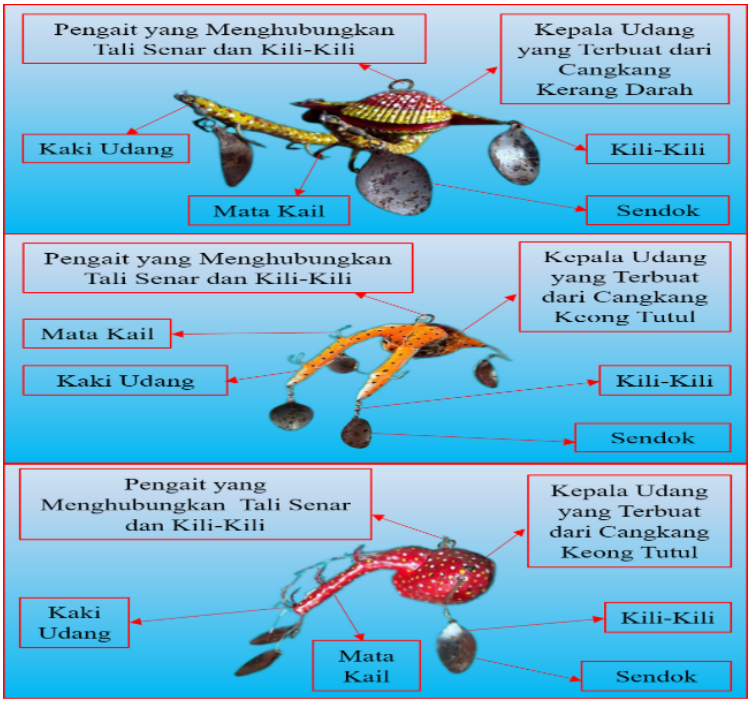

Fig. 7. The Construction of Artifacial Shrimp Bait

shrimp bait is also equipped with other constructions such as equipped with hooks number 9 as many as 3-4 pieces, then kili-kili number 8 as many as 3-4 pieces which are used as hooks for spoons. The spoon used is a spoon cut to a size of 1-2 cm made of stainless material with a function as a rudder as well as to attract the attention of octopus.

The artificial shrimp bait in the form of shrimp heads and legs used by fishermen in Arubara Village, Tetandara Village, South Ende District, Ende Regency is certainly not much different from the construction of other artificial shrimp baits used by fishermen in octopus fishing in other regions in Indonesia, because what distinguishes it only lies in the size of the head and legs and also the color. This is in accordance with the reports of several previous researchers such as Jamil *et al.* (2019) who reported the construction of artificial shrimp fishing gear used in octopus fishing by fishermen in Padaelo Village, Pulau Sembilan District, Sinajai Regency, South Sulawesi Province. Likewise, as reported by Minggo *et al.* (2023) who observed octopus fishing by fishermen in Nangahale Village, Sikka Regency, East Nusa Tenggara Province, who found that the manufacture of artificial shrimp bait for octopus fishing certainly has a construction similar to artificial crab bait, but the difference is only in the shape of the shell and artificial legs, while the other construction is of course the same.

Conclusion

The fishing gear used in catching octopus comes from the hand line class with a construction consisting of a fishing line reel, string, kili-kili and bait (artificial bait). The baits used are pocong-pocong, crab and artificial shrimp baits. The size of the string for pocong-pocong bait is No. 2000 and for crab and artificial shrimp bait No. 1000, then kili-kili with size No. 3-4. The bait used has its own construction, namely pocong-pocong bait resembling an octopus consisting of a head wrapped in dark-colored cloth, an iron hook connecting the string and kili-kili, a cloth cut to resemble tentacles from the head dressing, equipped with mines, then artificial crab bait has a construction consisting of a crab body equipped with a hook connecting the string and kili-kili, crab legs equipped with hook number 9 as many as 4 pieces, then kili-kili number 8 as many as 4 pieces and a spoon. As for artificial shrimp bait, the construction is similar to the construction of crab bait but the only difference lies in the shape of the body and legs.

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