

**IDENTIFICATION AND SELECTIVITY OF OCTOPUS AND FISHING TOOLS
SIDE-CATCHES IN THE WATERS OF NANGHALE VILLAGE
SIKKA DISTRICT**

PROPOSAL

By

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**WATER RESOURCES MANAGEMENT STUDY PROGRAM
FACULTY OF HUSBANDRY, MARINE AND FISHERIES
NUSA CENDANA UNIVERSITY
Kupang 2023**

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SIKKA DISTRICT**

PROPOSAL

**Submitted to the Faculty of Animal Husbandry, Maritime Affairs and Fisheries, University of Nusa
Cendana to fulfill some of the requirements to obtain a Bachelor of Fisheries (S.Pi) degree**

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EXAMINATION SHEET

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FOREWORD

Praise and gratitude the author goes to God Almighty for the love and His grace so that the author can complete the preparation of research proposals with

Title **Identification and Selectivity of Octopus and Sidecatch Gear in**

The waters of Nangahale Village, Sikka Regency The author is aware of the preparation of this proposal could not have been possible without the help and encouragement of many people. Therefore, the author with wholeheartedly thank all those who have helped

complete the preparation of this research proposal specifically to:

1. Dr. Lady Cindy Soewarlan, S.Pi., M.Si as Supervisor I
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one by one who have supported and assisted in the preparation of this research proposal, The author realizes that the research proposal still has deficiencies and is still far from being perfect perfection because of the limited knowledge that the author has. Therefore, the author of course really hope for constructive criticism and suggestions from both the supervising lecturer, examiner lecturers and other lecturers and friends who read this article.

This paper is expected to provide benefits for readers and writers who will conduct research.

Kupang, March 2023

Arnoldus Yanrian Nahak

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I. Introduction

A. Background

Octopus is a fishery commodity that has high economic value with a wide distribution, found in almost all Indonesian marine waters (Beautiful Rufiati et al. 2021). Based on statistical data from the Ministry of Maritime Affairs and Fisheries (KKP 2022), the total production of octopus fishery in Indonesia in 2020 is 55,913 tonnes with a production value of IDR 1.2 trillion. The largest octopus production contributor area is East Nusa Tenggara (19,102 tonnes), then followed by Central Sulawesi (10,411 tons), and East Java (7,838 tons). In addition to the high number of production, octopus is one an export commodity with a fairly competitive value. Data from the International Trade Centre (ITC) Trade Map shows that octopus export volume throughout 2020 reached 17,752 tons with an export value of USD 68.5 million or equivalent to IDR 979.4 billion. Country of destination the largest octopus exports in 2020 were China (3,464 tons), Italy (3,343 tons), and America (2,837 tons).

Octopus is also one of the export fishery products in East Nusa Tenggara Province (NTT) which is quite promising. Fish Quarantine Station, Quality Control and Safety Fishery Products (SKIPM) Kupang reported that throughout January 2019, the province of NTT had exported 24 tonnes of octopus to China. The 24 tons of frozen octopus that were exported were from the island Flores sent via Surabaya, East Java, said the Head of SKIPM Kupang. export the octopus was made by PT Okishin Flores with a value of USD 63,000. Octopus commodity is one of the marine products from the local province which started interested in China. The first export of octopus from NTT has been carried out since 2018 reached 15.8 tons ([https://econusa.id/id/ecoblog/gurita-salah-satu-primadona-eksport fisheries-indonesia/](https://econusa.id/id/ecoblog/gurita-salah-satu-primadona-eksport-fisheries-indonesia/) 2022).

Catching octopuses in various regions in Indonesia is carried out in various ways fishing gear and bait, including *jigger* fishing gear equipped with bait imitation resembles a crab (Nurdiansyah et al. 2015). Initial survey results were in July 2022 in Ende Regency assisted by the Tananua Foundation received fishing gear what is used is a hand line fishing gear that is modified to resemble an octopus what the local people call pocong, crabs and spears. Octopus as potential non-fish soft animal fisheries in Indonesia (Rita et al. 2019). Because of resources

octopuses (*octopuses*) are scattered throughout the waters in Indonesia. Indonesia also has certain places recorded in statistical reports about octopus landings.

The octopus fishery is currently not well managed, indicated by its absence of regulation and utilization is still *open access*. The amount of demand for octopus exports led to an increase in fishing effort resulting in a decrease in stocks and the occurrence of overexploitation (Rufiati et al. 2021). Octopus fishery problems in Indonesia are limited data and information that is complete and accurate about the status and utilization of octopus resources related to fishing gear. Because of its potential for management of sustainable octopus fisheries, it is important to strengthen research with other information about fishing gear, gear selectivity, catch target and non-target catches that can be used for octopus fishery management. Therefore it is necessary to carry out capture fisheries management using an approach Ecosystem Approach to Fisheries Management [EAFM] 2014. The approach regulates regarding environmentally friendly fishing and capture selectivity. But the lack of research and the condition of the people who are familiar with the species that are mainly caught fish.

B. Problem Formulation

Based on the background above, several problems can be formulated as follows:

1. What type of fishing gear is used to catch octopus?
2. How do the octopus fishing gear used by fishermen operate?
3. Does the fishing gear used also produce other catches?
4. What is the level of friendliness of the octopus fishing gear operated by fishermen?

C. Research Objectives

This research aims to:

1. Identify the types of octopus fishing gear used
2. Knowing the forms of practice of octopus fishing gear
3. Identifying bycatch.
4. Knowing the friendliness level of octopus fishing gear.

D. Research Benefits

The benefits of this research include: 1. Researchers

To add insight or knowledge about the potential for octopus fisheries and octopus fishing gear operated by fishermen in Nangahale Village.

2. Local Government

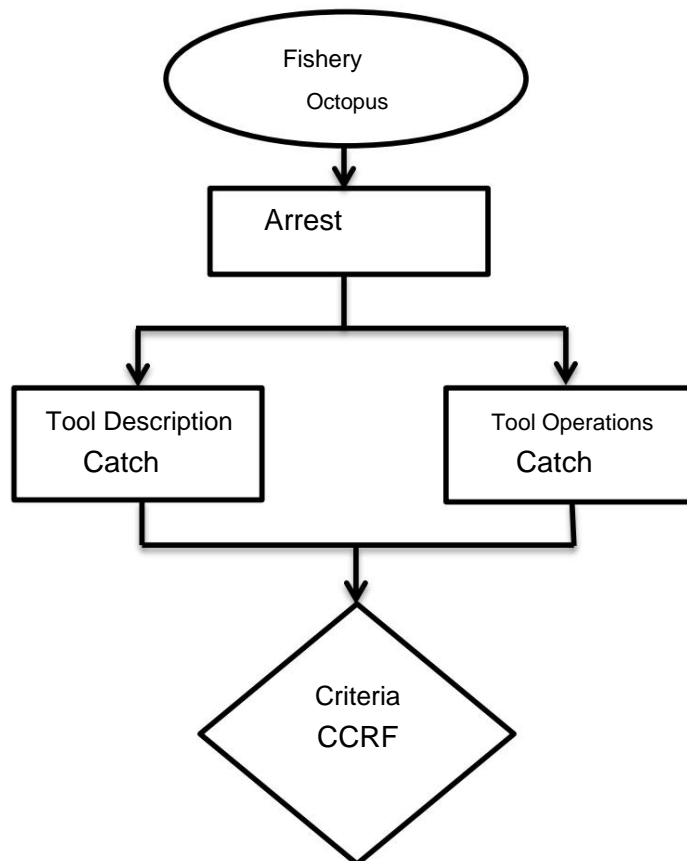
Can be used as basic information or data that is important in efforts to manage fishery resources in Sikka Regency or in order to support the preparation of an important *database* for the development of Octopus fishing gear in the future.

3. Society

In order to maintain the resources or potential of the octopus fishery in the local area.

E. Thinking Framework

In general, the preparation of this proposal is based on a frame of mind that can look at the picture below:



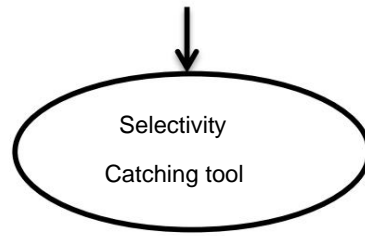


Figure 1. Research Thinking Framework

II. LITERATURE REVIEW

A. Octopus Production

Global octopus fish production carried out over the last three decades conveys Octopus fisheries are relatively stable increasing, reaching a doubling of 179,042 tons in 1980 to 355,239 tonnes in 2014. More than 50% of global octopus catches come from Asia. China is the largest catching nation comprising between 100,000 and 150,000 tons per year. Morocco is the second largest catching country recording 64,000 tonnes in 2015 and 55,000 tonnes in 2016. Mexico, Mauritania and Japan each caught over 30,000 tonnes in 2016. From 2015 to 2016, there was a small increase in catch volume. During this period, the octopus catches represent 8–12% of the total catch (Sauer, et al. 2020).

Based on the 2021 Ministry of Maritime Affairs and Fisheries (KKP), production octopuses in Indonesia as many as 19,098 tons with a value of IDR 548.90 billion in 2021. Total it decreased 0.38% from the previous year which reached 19,171 tons. In 10 years finally, the most octopus production reached 21,584 tons with a value of IDR 746.08 billion in 2017. Meanwhile, the production of these fishery commodities is at least 6,838 tons with a value of IDR 141.77 billion in 2014. By region, Java East is the province that produces the most octopus, namely 5,355.56 tons in 2021. This figure is equivalent to 28.04% of the total octopus production in Indonesia. As much 3,553.61 tons of octopus were produced in Central Sulawesi. Then, another 2,877.06 tons of octopus produced in North Sumatra. Meanwhile, only 1.79 tons of octopus were produced in Central Java. Matter that makes Central Java the province that produces the least octopus in 2021. Above it are Lampung and Bali with consecutive octopus production of 7.5 tonnes and 10.11 tonnes. Meanwhile, 11 provinces do not produce octopus, namely Jakarta, Jambi, West Kalimantan, South Kalimantan, Central Kalimantan, North Kalimantan, North Maluku, Riau Islands, Papua, Riau, West Sulawesi.

B. Capture fisheries

Based on Law (UU) No. 45 of 2009 states that Fisheries are all activities related to the management and utilization of natural resources fish and its environment from pre-production, production, processing to marketing carried out in a fishery business system. Capture fisheries are activities which include catching or collecting aquatic animals and plants that live freely in sea water or in public waters (Nurhayati, et al. 2020). Capture fisheries regulated in the Republic of Indonesia's Fisheries Management Area Indonesia, hereinafter referred to as WPPNRI, is a fisheries management area capture which includes inland waters, archipelagic waters, territorial sea, additional zones, and Indonesia's exclusive economic zone.

C. Morphology and Classification of Octopus

Cephalopods are a class of the phylum Molluscs which can be found in all seawater. Benthic species can be found in coral reef areas, plains seagrasses, sand, silt, and between rocks. Epibenthic and pelagic types are common found in bay waters (Hafid Y. 2022). Coral Octopus (*Octopus cyanea*) belongs to class Cephalopods of the Octopodidae tribe, the genus Octopus, from the phylum Mollusca, which is a genus the most famous among the genera of the class Cephalopoda. This genus consists of about 150 species that live in almost all the world's seas, from tropical to arctic seas north and south pole (Lane, 1957), referenced by (Rufianti et al. 2021).

Octopus body parts can be divided into five parts: body, eyes, swimming membranes, suction bag and hand. In general, the body shape of the octopus is rather round or round short, no fins. On the round body there are protrusions like warts. The main body of the octopus resembles a bubble and is covered by a casing, then tapers to form a kind of "neck" where it meets the head. Head shape of this octopus is very clear with a very complex pair of eyes so that the octopus have perfect vision and are surrounded on the front (anterior) by arms. The octopus has eight arms and is equipped with swimming membranes (membrane) which is located in the crevices of the base of the arm. On each arm

found two rows of suction sacs arranged lengthwise starting from the base of the arm to the cuffs and has no horn-like edges. The mouth is located at the part of the head that is surrounded by the arms (Hafid Y. 2022)

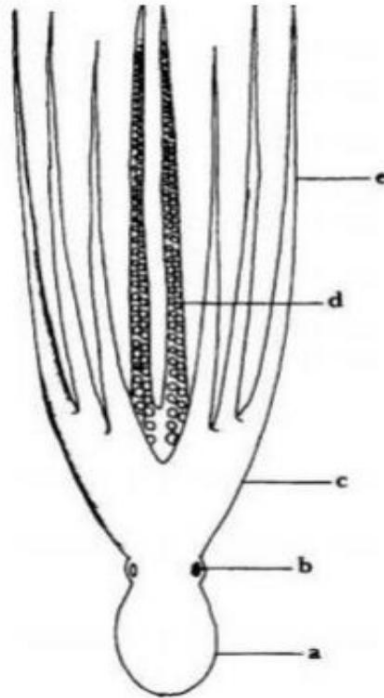


Figure 2. Morphology of Octopus sp. : a. Body, b. eyes, c. swimming membrane, d. suction bag, e. arm (Source Norman, 1992), ignored by (Hafid Y. 2022)

In complete order of octopus classification (*Octopus cyanea*) according to the World Register of Marine Species are as follows:

kingdom	: Animalia;
phylum	: Molluscs;
Class	: Cephalopods;
Subclass	: Coleoidea
Order	: Octopods;
Suborder	: Octopodiformes
Superfamily	: Octopodea

Family : Octopodidae;
genus : Octopus;
Species : *Octopus cyanea*

Octopus is Octopus is a predator that is more benthic in comparison pelagic. Octopuses tend to be active during the day or when it's bright, and hunt for food during the day night time. They have excellent camouflage abilities. octopus too have the ability to mimic the patterns and textures of the substrates they inhabit. Octopus Habitat found in Ende waters, which are often encountered by fishermen. *Octopus cyanea* by Dominantly inhabit coral reefs and rocks on the beach and in tidal areas waters with a depth range of 0 - 150 m. Octopus cyanea usually hunts during the day day.

D. Octopus Catcher

There are various types of fishing gear used to catch octopuses as follows:

a. Octopus Trap

Octopus traps are framed traps with one partial entrance blocked usually with a plastic strip, easily pushed by the octopus but not backwards. These traps have various types of fish and are usually baited with fish (Saurel et al. 2020). These traps can be made using a variety of local foodstuffs or can use wire.



Figure 3. Octopus Trap Catcher (Saurel et al. 2020)

b. Pocong Catch Tool

Pocong fishing gear is one of the hand line fishing gear used for fishing catching octopus, the mention of the name pocong because this fishing gear is modified resembling an octopus (Rita et al. 2019). Complete fishing gear construction consists of: head, body, attractor rope, fishing line. Ball-shaped part of the head, Pada the head and body of the attractor have attractor straps. This rope functions as the binder of the attractor cloth so that when it is lowered into the water the attractor cloth is not easy regardless. The body parts have fingers or tassels (attractors) with size length varies. Installation of tassels on pocong aims to attract attention octopus out of the nest. Pocong fishing gear is equipped with a tonda rope with and attractor rope as long as it is made of strings. This pocong-pocong fishing gear different from other fishing gear, because it resembles an octopus. Fishing line section shaped like a tube made of cast cement. This section works too as a ballast.

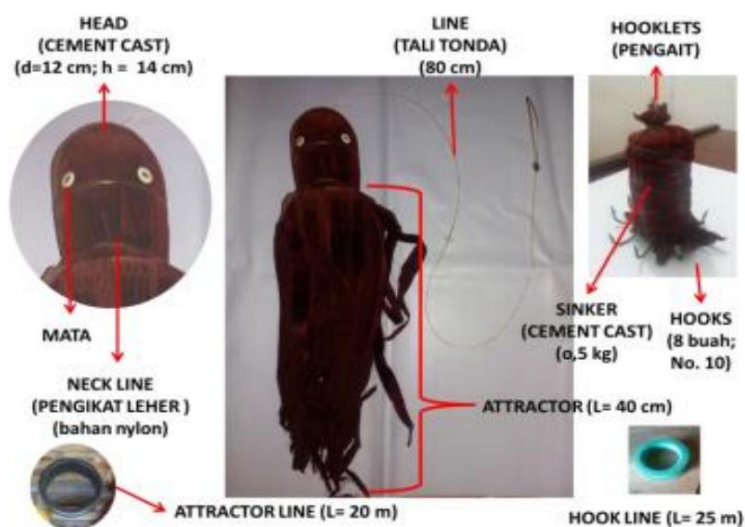


Figure 4. Pocong fishing gear (Rita et al, 2019)

This fishing gear is operated in coral areas, where there are octopuses hiding in the holes under the reef. The fishing line is lowered almost to the bottom while the boat keeps running waiting for an octopus to hug the cloth, then the fishing line directed to the octopus and pulled, after the octopus was hooked then the fishing line was pulled onto the boat and take the catch (Manohas et al. 20

III. RESEARCH METHODS

A. Time and Location

This research is planned to be conducted for 3 months starting from April until June 2023, which is located in the residential waters of Nangahale Village, Sika Regency.

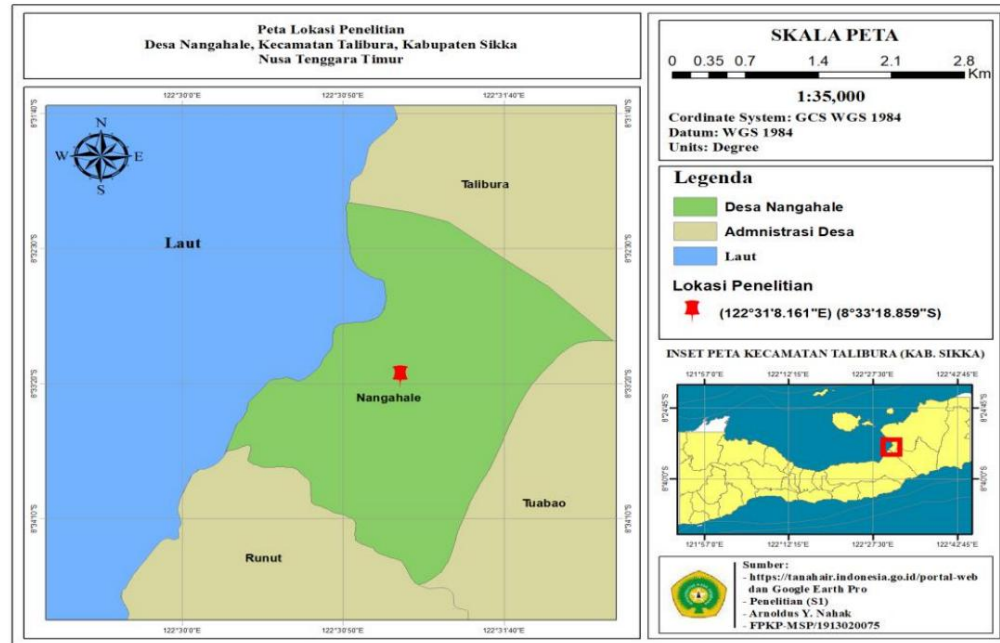


Figure 5. Research location map

B. Tools and Materials

The tools and materials used in this research can be detailed in the following table.

Table 1. Research Tools and Materials

No	Name	Function
1	Octopus fishing gear	To determine the selectivity and side catch of octopus fishing gear
2	Waterproof Camera	To take pictures or documentation at the time of research
3	Stationery	To record the data obtained at the time

		ongoing research
4	Fleet or Ship	Transportation During Research

C. Method

The research method used is a quantitative or survey method, for know the general description of the fishing gear used to catch octopuses in the village Nangahale Sikka Regency includes the main catch and catch species. In addition, it is done through direct observation of the object to be examined. Data collection techniques in this study using observation techniques. Technique observation is to directly observe the type of fishing gear used at the time catching octopus and by-catch from the fishing gear.

D. Population, Sample and Sampling

The population used in this research process is the octopus fishing gear used by fishermen in Nangahale Village, Sikka Regency, octopus catching activities done in March. During the process of catching octopuses in the village of Nangahale the possibility of fishermen using the same fishing gear.

F. Research Stages

1. Follow the fisherman to the location of the fishing operation to find out the fishing gear used by octopuses in the waters of Nangahale Village Sika District.
2. Identify the main catch and bycatch from fishing gear octopus used by fishermen in the waters of Nangahale Village, Sikka Regency.

G. Data Analysis

In analyzing the data in this study it is divided into two, namely:

1. Descriptive Data Analysis
Descriptive data analysis was carried out directly in the field by directly observing the octopus fishing gear which was the object of research.

2. Fishing Gear Friendliness Level

Environmentally friendly technology data analysis is carried out based on FAO provisions in CCRF (1995) then an analysis of 9 criteria that are ignored by (Rufiati et al. 2021):

Table 2. Criteria for assessing the level of environmental friendliness of fishing gear.

No.	Criteria 1	Sub Criteria	Score
	Has high selectivity	Catching more than three species of fish with a wide variety of sizes.	1
		Catch three species of fish or less with a wide variety of sizes.	2
		Catch less than three species of relatively uniform size. Fish of one species with	3
		relatively uniform size	4
2	Does not destroy habitat Causes	habitat destruction in a large area Causes habitat damage in	1
		a narrow area Causes some habitat damage in a narrow area	2
		Safe for habitat.	3
			4
3	Produce high quality fish	Dead and rotten fish	1
		Dead fish, fresh, physically disabled	2
		Dead and fresh fish	3
			4
4	No harm to fishermen	Live fish Can result in death for fishermen 1 Can result in permanent disability for fishermen. 2 Is only a health problem which is temporary 3 is temporary Safe for fishermen Has a big chance of causing	4
5	Production endangers consumers No	death to consumers Has a chance to cause health to consumers	1
		Relatively safe for consumers Safe disturbance for consumers By-catch,	2
		there are several species and	3
		they cannot be sold in	4
6	Low by-catch	the market By-catch there are several species and there are	1
		species that sell well in the market By-catch are less than three species	2
		and sell well in the market.	3
		By-catch less than three species and 4	

		has a high price Causes death of	
7	Biodiversity impact	to all living things and destroys habitat Causes death of several species and destroys	1
		habitat Causes death of several species but does not destroy habitat	2
		Safe for biodiversity 4 Protected fish are often caught 1 Protected fish have been	3
		caught several times 2 Protected fish have been caught	3
8	Does not harm the protected fish	Protected fish have never been caught 4 Low investment	
		costs 1 Profitable 2 Does not conflict with local culture 3	
		Does not conflict with existing regulations 4.	
9	Socially acceptable		
TOTAL SCORE			36

The score or maximum value is 36 points, while the category is the level of friendliness gear environment is divided into four categories, with ranges of values:

- 1-9 is not very environmentally friendly
- 10-18 not environmentally friendly
- 19-27 eco-friendly
- 28-36 is very environmentally friendly

The final result can be obtained by adding up the total weight based on the value

Respondents' answers were divided by total respondents according to Sima *et al.*, (2019) as follows:

$$X = \frac{\sum y}{N}$$

$$X = \frac{\sum y}{N}$$

Information:

X = Weight Value = Total X divided by N

Xn = The total weight of the value of the respondent's answer

N = Total respondents

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ATTACHMENT

Research Budget Plan

No	Tool Description and Material	Volume	Unit	Unit Cost (IDR)	Amount (IDR)
1	Gopro Hero 7 camera Black	1	Fruit	5,500,000.00	5,500,000.00
2	Fleet or Ship	1	Fruit	150,000.00 / Per Day	13,500,000.00
Total					19,000,000.00