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## Capture fisheries business activities in Anambas islands regency, Indonesia: A review of traps fisheries

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### Abstract

It is necessary to pay attention to the dependence of the people in the Anambas Islands Regency on marine products so as not to disturb the balance of the ecosystem in the sea. Information on the components involved in the trap fishing effort is needed to support the sustainability of area management. The operation of trap fishing gear in Batu Belah Village takes place every day by 1 fisherman who brings 20–30 units of trap fishing gear. The composition of the catch was dominated by the Leopard coral grouper (*Plectropomus leopardus*). The business capital that needs to be spent every year is updating the trap fishing gear. The total operational cost of trap fishermen is IDR 47,000.

**Keywords:** trap fisheries, fishing effort, capital, operational costs, construction of fishing gear

### 1. Introduction

The fishing business is defined as an economic activity in which each activity is based on economic considerations so that the business being carried out generates profits <sup>[1]</sup>. The development of a fishing business in an area is expected to be able to open jobs and increase the income of the surrounding community <sup>[2]</sup>. The capture fisheries business is growing along with the increasing market demand, especially for marine fish <sup>[3]</sup>. It is necessary to supervise fishing business activities so that the sustainability of fishery resources is maintained <sup>[4]</sup>.

Anambas Islands Regency is part of the Riau Archipelago Province which is geographically located between 2°10'0" - 3°40'0" N to 105°15'0" - 106°45'0" E <sup>[5]</sup>. Most of the Anambas Islands Regency area consists of seas and distribution of islands in the waters of the Natuna Sea and the South China Sea <sup>[6]</sup>. Its sea area reaches 46,033.81 km<sup>2</sup> or equivalent to 98.73% of the total area, with only 1.27% of the land area covering 592.14 km<sup>2</sup> <sup>[7]</sup>. This has resulted in most people in Anambas Islands Regency depending on marine products for their lives <sup>[8]</sup>. Fishing efforts in Anambas Islands Regency are carried out with various methods, methods, and different objectives so that the fishing gear used is different. One type of fishing gear used is a trap.

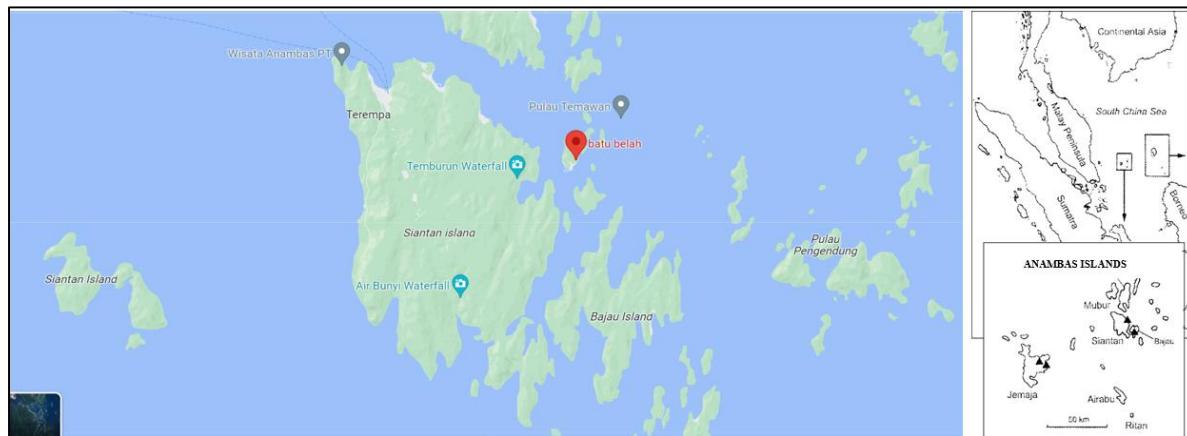
Fishery business opportunities that are widely open and the community's dependence on them can cause damage to the habitat and fishery resources in it <sup>[9]</sup>. Information about the various components that exist in the fishing effort is important to know to support the ongoing management of an area <sup>[10]</sup>. There is no specific information regarding the condition of capture fisheries in the Anambas archipelago, especially in trap fisheries. Thus, it is necessary to conduct an assessment of the condition of the capture fisheries business to improve the management of water areas. The research is focused on the analysis of fishing efforts using trap fishing gear in the Anambas Islands Regency.

### 2. Materials and Methods

The research was conducted in October 2015 in Anambas Islands Regency, precisely in Batu Belah Village (Figure 1).

The method used is the survey method. The data used are primary data and secondary data. Primary data was obtained from the results of a literature study regarding the general condition of the Anambas Islands Regency. Secondary data is in the form of characteristics of fishing gear, catches, and costs in the fishing effort. Secondary data was obtained

through direct interviews with fishermen in Batu Belah Village using a questionnaire tool. The questionnaire tool is used to facilitate data collection regarding activities in the fishing effort carried out. Respondents were determined using a purposive sampling method for 10 trap fishermen. Other tools used are cameras, ships/boats, and GPS.

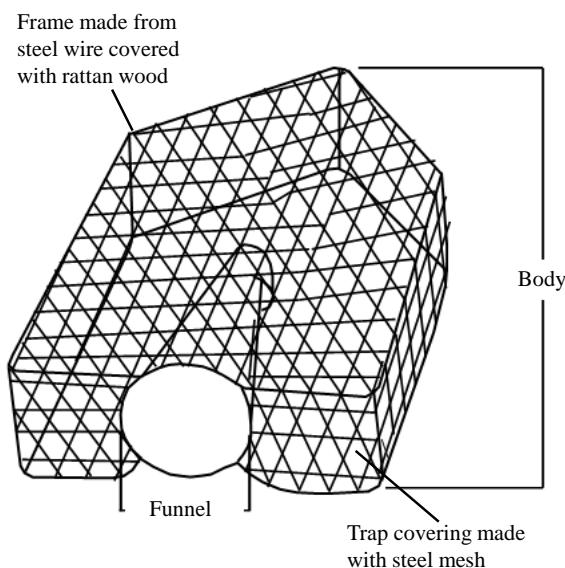


**Fig 1:** Map Location of Batu Belah Village, Anambas Islands District

### 3. Result

#### 3.1. Characteristics of Traps

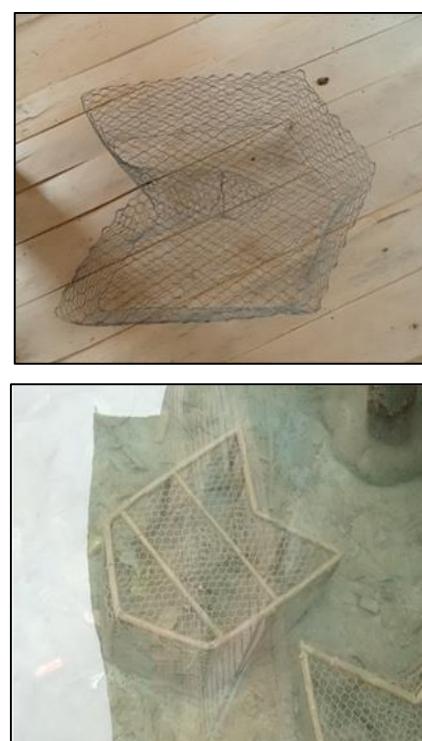
Trap with the local name Bubu, is a type of fishing gear that is classified into trap fishing gear [11]. Trap fishing gear in Batu Belah Village is made of steel wire, each frame covered with rattan wood. The shape of the trap resembles an arrow measuring 60 x 40 x 20 cm. The rattan attached to the frame serves to strengthen the wire trap construction so that it does not change shape because the trap is operated and covered by rocks. Vessels used in trap fishing operations are vessels with engines with a capacity of 8–15 PK. The ship is made of wood. Traps are operated by 1 fisherman who carries 13–20 trap units. The construction of trap fishing gear is shown in Figure 2.



**Fig 2:** Construction of Traps

The trap-catching unit in Batu Belah Village is operated every day through several stages, namely the preparation, setting, soaking, and hauling trap stages. The preparatory phase includes activities to prepare fishing supplies, fishing

gear, fishing aids, as well as boats and equipment. The trap installation stage is carried out by backfilling the trap with dead rock. The trap installation process was carried out from morning to evening in the area around Batu Belah Village. After the trap is installed, objects that block the entrance of the fish must be removed so that the fish can enter the trap. The trap immersion stage was carried out for two days from the time the trap was installed. The process of removing the trap is carried out by removing the rocks that are piling up the trap, then the trap is hauled and the caught fish is released into a container so that the fish stay alive. Fish that are caught are sold alive so the price of fish is higher than if it is dead. The trap fishing gear in Batu Belah Village is attached in Figure 2.



**Fig 1:** Trap Fishing Gear Operated in Batu Belah Village

### 3.2. Catch Composition

The composition of the trap catch per trip is attached in Figure 4. The fish composition of the trap catch only consisted of 2 fish species, namely the Leopard coral grouper (*Plectropomus leopardus*) and the brown-spotted grouper (*Epinephelus chlorostigma*). The catch was dominated by 4.5 kg of Leopard coral grouper or 56% of the total catch. As much as 44% of the catch, namely 3.5 kg of brown-spotted grouper. The fish caught are reef fish because traps are a type of fishing gear whose operations are carried out in rocky waters [12].

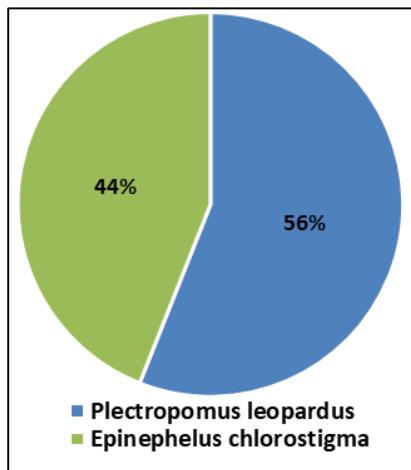


Fig 4: Composition of Trap Fishing Gear per Trip

### 3.3. Fishing Business Capital

The business capital for catching trap fishing gear is shown in Table 1. Fishermen spend quite a lot of business capital every year on fishing gear. The technical life of the trap is relatively short, so it can be said that the trap is a fishing gear that is easily damaged [13]. The trap is easily damaged because the operation is carried out by filling the trap with rocks. Its operation which takes place every day will eventually damage the trap construction due to continuous pressure.

The compressor is one of the tools that is still used by trap fishing gear fishermen in Batu Belah Village. The compressor is used by fishermen as an air supply aid when setting up traps [14]. Compressors are dangerous because they can cause decompression and death for fishermen [15]. Prohibition of using compressors as diving aids is contained in Article 9 paragraph (1) of Law no. 45 of 2009 concerning changes to Law no. 31 of 2004 concerning fisheries, that every person is prohibited from owning, controlling, carrying or using fishing gear or fishing aids that disturb and damage the sustainability of fish resources on fishing vessels in the fishery management area of the Republic of Indonesia. It is further explained in Article 9 paragraph (1) that fishing gear or fishing aids that disturb and damage the sustainability of fish resources include trawlers and compressors [16]. There are still fishermen who use compressors in secret so fishermen tend to run away when data collection is taking place. The necessities of life encourage fishermen to continue to use compressors as an operational tool for catching traps.

Table 1: Business Capital for the Procurement of Traps Fishing Units

Fishing units	Technical age	Purchase price (IDR)	Purchase time	Exp.
Fishing vessel	5 years	30,000,000	2010	1.5 GT
Engine	5 years	7,000,000	2010	16 PK
Fishing gear	1 years	2,000,000	2010	
Fishing equipment (compressor)	5 years	4,000,000	2010	

### 3.4. Fishing Operational Costs

Fishing operational costs are costs incurred during fishing operations and are usually incurred by the fisherman owner [17]. Each fishing gear has different operating costs due to various factors such as the length of operating time, the distance to the fishing ground, and the number of workers required. There are two components to the operational costs of catching using traps, namely for fuel and fishermen's consumption.

The cost incurred for fuel is IDR 17,000 per trip. The price of diesel in Batu Belah Village is IDR 8,500, so it is known that trap fishermen only need 2 L of diesel in one trip. The amount of fuel costs incurred is related to the distance to the fishing area traveled. The farther the distance that needs to be traveled, the more expensive the fuel costs incurred. Trap fishing operations are carried out in catchment areas that are not far away so that the costs incurred are minimal. Meal costs incurred are only IDR 30,000 per trip because the operational trap is only carried out by 1 person.

### 4. Conclusions

Trap fishing gear is operated every day by 1 fisherman who brings 20–30 trap units. The composition of the trap catch was dominated by 56% Leopard coral grouper. Considerable business capital is required annually to renew perishable traps. The total operational cost of catching by trap is IDR

47,000.

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