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Composition of catches of Bagan boats on KM.NF vessels in UPTD PPW II PPI Air Bangis Pasaman Barat Sumatera Barat

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Abstract
The research was conducted from January 01 to January 31, 2024, at the UPTD PPW II PPI Air Bangis, Pasaman Barat, West Sumatra Province. This study aimed to determine the target catch using the boat lift net fishing gear on the KM.NF vessel at the UPTD PPW II PPI Air Bangis Pasaman and to analyze the catch on Pini and Mentawai islands using the boat lift net fishing gear on the KM.NF vessel at the UPTD PPW II PPI Air Bangis Pasaman. The method used in this research was a survey method, which was analyzed descriptively. This boat lift net fishing gear utilizes light as a tool to attract the attention of fish, inviting them to approach the gear or enter the desired catch area, known as the catchable area. The boat lift net can be categorized into lifting nets based on its operational method. The use of light as an aid in boat lift nets continues to evolve, with variations ranging from stationary to floating boat lift nets. The fishing grounds for boat lift net vessels are located around the Mentawai and Pini islands, approximately 70 miles from the waters, with a depth of about 50 m. Fishing activities occur during the tide's ebb and flow at night. The process of retrieving the catch is done when the speed of the ebb or flow begins to weaken, ensuring more conducive conditions for fishing operations. The use of fishing gear is not.

1. INTRODUCTION

The boat lift net has a small mesh size, so various types of fish can be caught. The main catch of the boat lift net is anchovies, and the bycatch is mackerel, skipjack, baby tuna, sail, and mackerel. The indicators of excessive fishing on fisheries' resources are as follows: 1) The amount of fish catch (production) exceeds the MSY (maximum sustainable yield) of aquatic resources. 2) Fish catches are decreasing. 3) The average number of catches is getting smaller. 4) Fishing areas move farther from land or penetrate deeper into the seabed (Dahuri, 1996). Air Bangis is one of the largest fish producers in West Pasaman. The coastline is 72.56 km long. West Sumatra has an extensive sea area, including hundreds of islands in a straight line from north to south. The target fish for bagan fishing are small pelagic fish with positive phototaxis, meaning they are attracted to light (Sani et al., 2016).

Many islands certainly provide high biological resources, but until now, their sustainability has not been possible unless managed and supervised well. West Sumatra has a sea area of around 138,750 km with a coastline of 375 km. Additionally, 186 islands stretching from North to South West Sumatra have potential fisheries and marine resources. The impacts of excessive fishing on fishermen include decreasing catches, distance from fishing areas, increasing fishing costs, and decreasing fishermen's income due to low fish prices (Aqualdo & Wati, 2014). The boat lift net equipment has a relatively small

mesh size so that everything near the boat lift net is caught. The boat lift net operation has been operating at PPI Air Bangis for quite a long time, so it is feared that the catch diversity index will decrease due to the number of boats moored at PPI Air Bangis describing the business of catching Bagan boat as quite profitable. The number of fishing boats affects increasing catches. The increase in catch results is related to fishing productivity to determine the sustainability of fishing by fishing vessels.

The selectivity process is key in conserving and recruiting biological natural resources, ensuring that young fish can remain alive and contribute to reproduction. Using less selective fishing gear can result in bycatch, where various types of fish not the fishing target are also caught. This practice often results in the fish being thrown into the sea (discarded). This factor causes fishing gear to become less environmentally friendly, prompting research into the composition of the main and side catches of boat fishing gear.

Bagan is a fishing gear used to catch fish with high economic value (Borges et al., 2005). The boat lift net is one of the most dominant fishing gears in UPTD PPW II PPI Air Bangis, and the catches caught are the dominant ones. One of the ships that catches the most catches is the KM boat. NF. However, it is not yet known for certain how the fishing ability and the rate of increase and decrease in fish catches on the KM.NF vessel at UPTD PPW II PPI Air Bangis West Pasaman.

2. RESEARCH METHODS

Time and Place

This research will be carried out on 01-31 January 2024 at PPI Air Bangis West Sumatra.

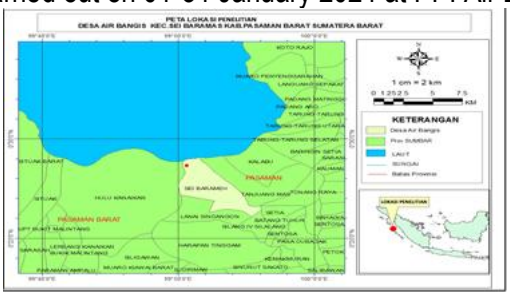

Figure 1. Location of sampling station

Methods

The method used in this research is the survey and interview method, namely collecting data on catches in fishing areas by participating in the data collection process in the field and interviewing fishermen who catch boat fishing gear at UPTD PPW II PPI Air Bangis West Pasaman, West Sumatra.

Procedures

The data collected is data on the type of fish caught, the number of individual fish caught, and the total weight of the fish caught. The data is grouped based on main catch, bycatch, and discards.

Data Analysis

The data analysis that will be used in this research is that the data that has been collected is arranged in the form of tables and graphs and then analyzed descriptively. Data regarding Main Catch Results (HTU), Bycatch Results (HTS), and Discards are analyzed descriptively. Next, the analysis results are presented in tabular form to provide a clear and detailed picture. In addition, the data is also given in histogram form, allowing better visualization of the distribution and frequency of each type of catch. Descriptive analysis was carried out to provide an in-depth understanding of the characteristics, patterns, and quantities of main catch results, bycatch results, and discards. Data was taken for 30 days. In this way, the information obtained can be more easily understood and used as a basis for making decisions regarding fisheries resource management.

Calculation The composition of the catch: $P(\%) = Ni/N \times 100$

Note:
P : Percentage of one type of fish caught
Ini : Number of each type of fish (kg)
N : Total catch (kg):

3. RESULTS AND DISCUSSION

Capture Fisheries Bagan Boat

Fish productivity and distribution in a fishery fluctuate. This is caused by changes in marine environmental conditions, which make capture fisheries challenging to predict. Fishing activities are an important aspect of aquatic biological resource management, focusing on exploiting biological resources that can cause imbalances. Fishing gear plays a crucial role in fishing activities, where using the right gear can facilitate fishing. Selecting fishing gear is important so that the results are optimal and do not damage the aquatic ecosystem. The Bagan boat is a rectangular fishing gear with the same length and width. Its construction involves nets, bamboo, iron pipes, ropes, lights, and motorized boats. The nets in this Bagan are made of waring material, which is then organized into pockets. The bag is formed from sheets of waring arranged or sewn to create a square-shaped bag, supported by a framework consisting of bamboo and iron pipes.

Ship Bagan Boat

A boat lift net is one of the vessels found at PPI Air Bangis. Bagan boats are often referred to as fishing boats, and they are used in fisheries activities for fishing operations and as a means of bringing catches to fishing ports. This vessel is specifically designed to operate net fishing gear and is equipped with auxiliary fishing equipment, such as line hollers and other equipment. With an appropriate design, the banana boat becomes an effective tool for catching fish and supports the sustainability of fisheries activities.

The type of fishing gear used on NF bagan boats involves using nets with certain specifications. The vessel is 25 m long, 25 m wide, 84 m high, and the net is 27 m long, 27 m wide, and 30 m high. The mesh size of the net, which measures the distance between the nodes of the net, is about 4 mm. These specifications give an idea of how a banana boat vessel is designed to catch fish by using a net that is specified in terms of size and depth to achieve the desired catch. In boat bagan fishing gear, a bagan frame is assembled on the left and right sides of the main vessel. The net is rectangular and black, with weights at each corner to prevent drifting. The net frame, a rectangular frame made of wood joined and tied with rope, is the same size as the net. This frame is a place to hang the net, sinker, and hanging rope connected to the net roller. The parts of a Bagan boat fishing gear involve the towline, lights, net, sinker, roller, and frame. All these components work together to support the efficiency and effectiveness of fishing using Bagan boat vessels.

Based on information on the KM.NF banana boat data from the owner, Mr Yoga Nofriandi, the fishing fleet used in the operation of the banana boat is a wooden ship measuring 24 GT with a ship length of 25 m, a width of 25 m, and a boat depth of 19 m. The ship uses two engines, namely the main engine with the Mitsubishi brand, with size of the ship's engine PK 120 pk, speed of 7 knots, and the weight of the main engine weighing 400 kg; the main engine functions to drive the ship and drain the electric current in the ship. Capstan engine with Mitsubishi brand weighing 200 kg pulls the net to lift the catch to the boat and lowers the net during fishing operations by 200 kg.

Fishing operations are conducted as the sun begins to set. Before heading to the fishing ground to start fishing, some preparations are made to ensure a smooth and successful operation. The following are some preparatory steps taken beforehand: Involves an overall vessel check to ensure that all systems and equipment function properly. This includes the engine, navigation system, safety equipment, and other components essential to the vessel's operation.

Fishing Gear Check. Ensures that fishing gear, such as nets, rollers, and Bagan boat frames, are in good condition and ready for use. Repairs or replacements are made if damage or wear is found.

Checking the Lights on the Bagan Boat. The lights on the Bagan boat are inspected to ensure they are in good working order. Lights play an important role in attracting fish at night. Preparation of Lifting Operation Supplies. Preparation of operation supplies involves ensuring the availability of fresh water, fuel for the boat engine, and other food supplies for the crew during the fishing operation.

Timing of the Operation: Fishing operations begin at sunset. The decision to start at this time may be influenced by the migratory patterns of fish in night fishing. By making these preparations carefully, boat lift net crews can improve the efficiency of fishing operations and ensure safety and well-being during these activities. Boat lift net Gear Lowering (*Setting*): Boat lift nets arrive at the fishing ground at night, with the distance usually between 4 to 7 hours, depending on the location and weather conditions. Once at the fishing ground, the lights on the Bagan boat are turned on. Halogen lights are the type of lights used to attract and gather fish towards the boat. The net is not lowered immediately, allowing the fish to gather under the light. This process helps to focus the fish's attention on the fishing area.

Next, the net and hanging rope are lowered slowly to a certain depth with the help of a roller. Although this process is done slowly, fishermen who are experts in operating this fishing gear can execute it efficiently. The skill and experience of the fishermen play an important role in carrying out this setting process quickly and effectively. During fishing operations, halogen lamps and this net-setting method are key strategies in attracting and catching fish efficiently at night.

The length of net immersion in boat nets is not fixed, and fishermen tend to only estimate based on observations of fish gathering around the nets. Fishers rarely calculate or determine the exact duration of net immersion time. The time it takes for the fish to gather under the light can vary but is sometimes estimated to take around 2-3 hours. This approach suggests that fishers' experience and instinct play a key role in judging when it is appropriate to lift the net. Observations of fish behavior around the Bagan and previous fishing success can serve as a guide to determine when it is optimal to end net immersion and begin lifting the catch.

Hauling the gear begins once the nets are soaked and the fish are collected under the lights. The initial stage involves gradually turning off the lights on the Bagan boat, with only the incandescent and fluorescent lights remaining on. This aims to keep the fish focused on the light around the Bagan. Next, the process of slowly lifting the net begins. The net is pulled up until it reaches the surface, and the fish caught by the net are lifted onto the boat deck. To facilitate the lifting of the fish, fishermen use dragging tools. Using lights maintained during the hauling process helps guide the fish onto the boat's deck, allowing the fishermen to capture the catch more efficiently. This process reflects the careful and planned fishing techniques practised by fishermen on Bagan boats.

Once the fish are caught and lifted onto the boat, the next step is sorting based on the type of fish caught. This process involves sorting the fish according to their kind. Once the sorting is complete, the fish are put into ice-filled crates, commonly known as cool boxes. Cool boxes maintain the quality and freshness of the fish by keeping the temperature low. After being put into the cool box, the fish crates are placed in the fish hold. A fish hold is a specially designed storage area on a fishing vessel to facilitate fish transportation while maintaining the condition and quality of the fish during the journey back to the port or landing site. The use of ice and cool boxes in conjunction with fish hatches are measures commonly taken to ensure that caught fish remains fresh and of good quality during the transportation process from sea to land.

4. CONCLUSIONS

The research on the KM.NF vessel found 11 fish species: 3 main catch species (tuna, flying fish, squid), six bycatch species, and two discarded species. The catch composition was 73% main catch, 26.8% bycatch, and 0.2% discards—the research on the KM.NF vessel found 11 fish species: 3 main catch species (tuna, flying fish, squid), six bycatch species, and two discarded species. The catch composition was 73% main catch, 26.8% bycatch, and 0.2% discards. According to Sudirman et al. (2011), the captured fish have varying lengths across different species.

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