

Utilization of FAD Distribution in South Buton Waters as a Fishing App by Purse Sein Fishermen in Kadatua District, Selatan Buton Regency

Bahtiar Hamar¹, Abdul Hadi Bone¹

¹ Water Resources Management Study Program, Faculty of Agriculture, University of Muhammadiyah Buton, Indonesia

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Abstract

Fish Aggregating Devices (FAD's) have long been used by fishermen in South Buton Regency. This study aims to determine the utilization of FAD distribution as a fishing aid by purse sein vessels in the waters of Kadatua District, South Buton Regency. This study aims to determine the utilization of FAD distribution as a fishing tool by purse sein vessels in Kadatua District, South Buton Regency. Data collection methods include FAD point data taken from GPS (Global Position System) fishermen and dominant catch data from purse sein fishermen. The results of the study obtained data on the distribution of FADs in Kadatua District spread between a distance of 0-12 miles, during the study the coordinates of FADs were obtained as many as 79 coordinate points owned by fishermen in Kadatua District. FADs used by purse sein fishermen to carry out fishing operations have 24 FAD points, which are spread over a distance of 0 – 12 miles. In April the distribution of FADs used as fishing aids by purse sein vessels was at a distance of $\pm 0 - 12$ miles, while in May and June FADs used as fishing aids were at a distance of $\pm 2 - 12$ miles. The dominant fish catch data for purse sein fishermen is 690 kg in April, 525 kg in May and 735 kg in June. The dominant catch during the study was dominated by scad fish (*Decapterus spp*). The level of effectiveness of the dominant catch of purse sein fishermen is highest at a distance of 4-12 miles with a total catch of 1,070 kg of the total catch of 1,950 kg.

Keywords: Fads, Fishermen, Purse Sein, Scad Fish, Effectiveness

Introduction

According to the Ministry of Maritime Affairs and Fisheries (2015) stated that small fishermen dominate the Indonesian fishery business world, namely 95.5%, with a total of 643,100 vessels under 10 GT. Fishermen are one of the key players in resource management. However, what fishermen get is not always what they expect. Fishermen's welfare may seem constant or in place. Various problems of fishermen arise when they try to improve their welfare. This problem is related to internal problems in the social structure of the coastal area itself and external problems related to natural disasters which are increasingly difficult to predict. Fishermen's businesses in increasing their catch have an alternative to overcome these limitations, namely by catching fish using FADs. FAD-based fishing operations have many benefits, including reduced fuel oil extraction costs, shorter fishing times, and clear fishing grounds (Hsu et al., 2021).

According to Albert et.al (2014) stated that the presence of FADs in waters can increase fish production, catches around FADs are always higher than in waters without FADs. This is in accordance with Prayitno et al. (2016) opinion that the presence of FADs can lead to the formation of potential fishing areas. In addition, FADs can not only increase fishing success by increasing fish density, but also attract marine biomass such as fish.

Utilization of fish resources, especially in the waters of South Buton Regency in the WPP714 area, has been fully exploited, both for demersal and large pelagic fish, so fishing efforts must be closely monitored. Meanwhile, small pelagic fish status can increase catches. However, the higher the utilization of FADs, the lower the catch per unit. This indicates that the average catch is on a downward trend from year to year.

The success of using FADs as fishing aids is determined by a good understanding of the productivity of the fishing gear, the function of the fishing gear, the size and biological aspects, and the number of fish caught per species. A study on the use of FAD distribution as a fishing tool in the waters of Kadatua Buton Selatan District is very necessary to do.

This study aims to determine the utilization of FAD distribution as a fishing aid by purse sein vessels in South Buton waters.

The benefits of research can provide scientific information in developing science and technology related to the development of FAD fisheries and can be used as consideration and information for the government in determining FAD management policies as an effort to preserve fish resources.

Material and Methods

This research was conducted for three months, from April to June 2021, located in Kadatua District, South Buton Regency. Data on the dominant catch of purse seine vessels that use FADs as fishing aids landed in Kadatua sub-district. Weekly data on landings of caught fish is used to calculate the productivity of fishing gear obtained during the study from purse sein vessels. The determination of FAD distribution points was obtained directly from the fishermen's GPS (Global Positioning System) and from the captain of the purse sein vessel. The data on the coordinates of the FADs obtained are then processed using ArcGIS 10.8 software which is then presented in the form of images.

Results and Discussion

Distribution of FADs in South Buton waters

FAD (Fish Aggregating Device) which are generally used by fishermen in South Buton waters are categorized as shallow sea and deep sea FADs. FADs installed in the waters of South Buton Regency by fishermen are still traditional as shown in Figure 1 below:



Figure 1. FADs used by Purse Sein fishermen

From the results of observations, FADs that are generally used by fishermen in Kadatua District are shallow sea and deep sea FADs which are categorized as surface settled FADs. According

to the Minister of Maritime Affairs and Fisheries Number 18 of 2021 in Chapter III paragraph (3) it explains that the permanent FADs as referred to in paragraph (1) letter b are FADs that are permanently placed using anchors and/or weights. In addition, Tamarol & Wuaten (2013) explain that FADs are one of the fishing aids for fishermen whose placement is in shallow and deep seas whose placement is permanent which functions to attract schools of fish.

The construction of FADs used by fishermen in Kadatua District as shown in Figure 1 is still traditional, which can be seen from the components used consisting of bamboo, ballast rope, attractor, attractor rope, and attractor ballast. The Minister of Maritime Affairs and Fisheries Regulation number 18 of 2021 in paragraph 4 explains that FADs are fishing aids that become one unit with fishing vessels, use various forms and types of lures/attractors from solid objects, function to lure fish to gather, which are utilized to increase the efficiency and effectiveness of fishing.

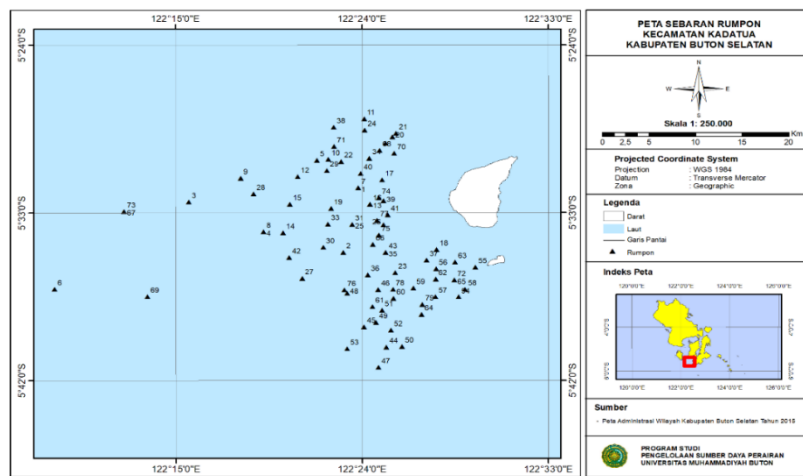


Figure 2. Distribution of FADs in South Buton waters

The results of the study obtained data on the distribution of FADs in Kadatua District spread between a distance of 0-12 miles, during the study the coordinates of FADs were obtained as many as 79 coordinate points owned by fishermen in Kadatua District. Based on Figure 2, it can be seen that the distribution of FADs is very dense, where the distance between one FAD and another FAD is close to each other which is less than 10 miles away, where many FADs are only $\pm 1-2$ miles between FADs. According to the Regulation of the Minister of Maritime Affairs and Fisheries Number 18 of 2021 in chapter IV article 16 explaining the placement of permanent FADs at WPPNRI in Sea Waters as referred to in Article 12 paragraph (6) that the distance between FADs is at least 10 (ten) nautical miles. Based on this regulation, the placement of FADs in South Buton waters is not in accordance with existing regulations, so it is necessary to regulate the placement of existing FADs.

Distribution of FADs used by Purse fishermen

During the study of FADs used by purse sein fishermen to carry out fishing operations, there were 24 FAD points (figure 6), spread over a distance of 0 – 12 miles. In April the distribution of FADs used as fishing aids by purse sein vessels was at a distance of $\pm 0 – 12$ miles, while in May and June FADs used as fishing aids were at a distance of $\pm 2 – 12$ miles. In April FADs used as fishing aids by purse sein vessels are at a distance of $\pm 0 – 12$ miles 8 FAD points, while in May and June each 8 FADs used as fishing aids are at a distance of $\pm 2 – 12$ miles. Details of FADs used are in April FADs at a distance of 0-2 miles as much as 1 FAD, a distance of 2-4 miles as many as 4 FADs, a distance of 4-12 miles as many as 3 FADs, in May a distance

of 2-4 miles as many as 5 FADs, distance 4-12 miles of 3 FADs, while in June the distance of 2-4 miles is 4 FADs and 4-12 miles of 4 FADs. The FAD distribution map can be seen in Figures (3, 4, and 5).

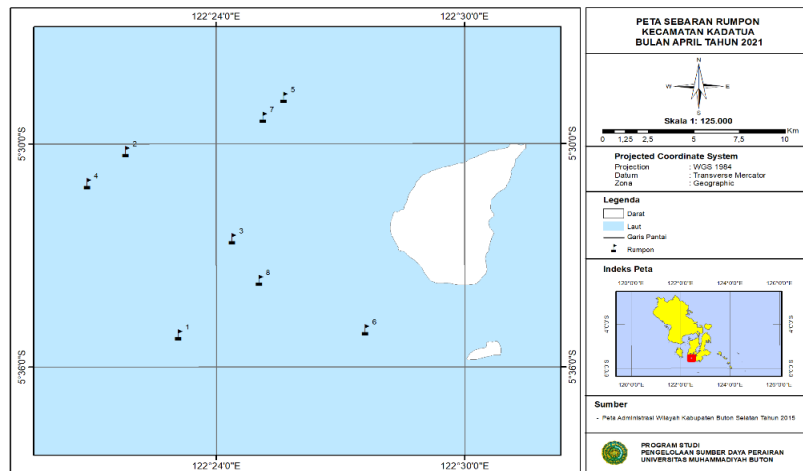


Figure 3. Distribution of FADs for purse sein fishermen in April

Based on the results of the study, there is 1 FAD point whose position is on fishing line 1A (0 - 2 miles), for line 1 B (2-4 miles) there are 13 FADs and lane II (4 - 12 miles) there are 10 FADs (Appendix 1) . Based on these data, it can be seen if there are fishing lanes that are not in accordance with the regulations set by the government where there are 14 FAD points that become fishing grounds for purse sein fishermen, namely on the 1 A (0 - 2 mile) fishing line and the IB line (2 - 2 miles). 4 miles) while there are 10 FAD points on line II (4 – 12 miles). This condition is not in accordance with the regulations set for purse sein vessels in Kadatua District. The type of fishing gear used by fishermen in Kadatua District is purse sein vessels with 10 – 30 GT with one boat, with a net length of ± 300 – 400 meters with a net mesh size of > 1 inch.

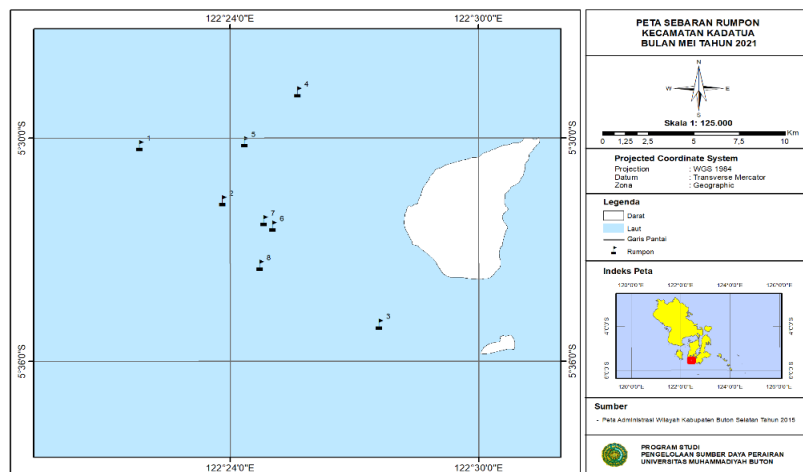


Figure 4. Distribution of FADs for purse sein fishermen in May

Based on the regulations issued by the government, purse sein fishing gear in Kadatua sub-district is included in the category of small pelagic ring seine with one vessel operating on fishing line II with a distance of 4-12 nautical miles. According to the Minister of Marine Affairs and Fisheries Regulation No. 18 of 2021 concerning Placement of Fishing Equipment and Fishing Aids in the Fisheries Management Area of the Republic of Indonesia and the High Seas and Arrangement of Fishing Andon in article 24 paragraph 1 (b) describes the size of the

mesh bag 1 (more than or equal to one) inches and the length of the Upper Ris Line 400 (less than or equal to four hundred) meters, ABPI in the form of FADs and/or lamps with a total power of $\pm 8,000$ watts, and motor boats measuring $> 5 - 30$ GT on Fishing Line II in WPPNRI 714.

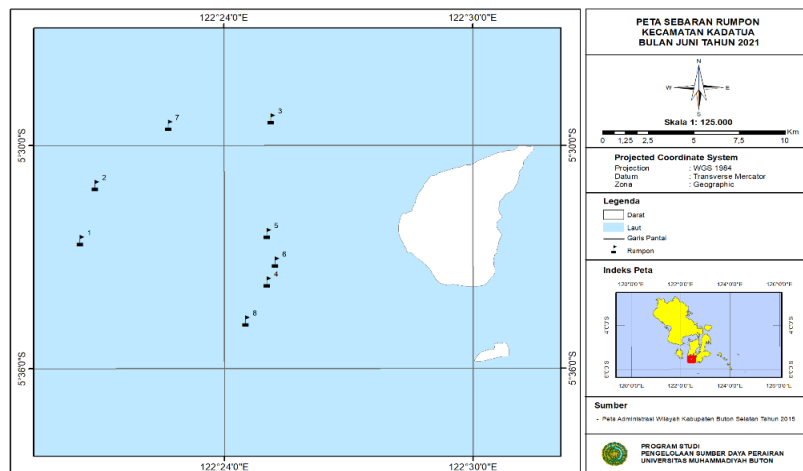


Figure 5. Distribution of FADs for purse sein fishermen in June

Based on the description above, the fishing area carried out by fishermen in Kadatua District is incompatible with the regulations issued by the government, it is necessary to make efforts from the local government to make efforts to regulate the fishing area in accordance with applicable regulations.

Purse seine fishermen's dominant catch

Table 1. The Dominant Catch of Purse Seine Fishermen during the study

Rumpon Distance (miles)	Moon						Total Catch (kg)
	April		May		June		
	Number of units	Catch (kg)	Number of units	Catch (kg)	Number of units	Catch (kg)	
0-2 thousand	1	75	0	0	0	0	75
2-4 thousand	4	255	5	235	4	315	805
4-12 thousand	3	360	3	290	4	420	1,070
< 12 thousand	0	0	0	0	0	0	0
Total	8 unit	690 kg	8 unit	525 kg	8 unit	735 kg	1,950 kg

Based on table 1, data obtained by the dominant catch of purse sein fishermen, namely in April the dominant catch of purse sein fishermen was 690 kg, in May of 525 kg and in June of 735 kg. The dominant catch during the study was dominated by scad fish (*Decapterus spp*). Based on the results of observations and interviews with several fishermen, the beginning of the fishing season for scad fish (*Decapterus spp*) occurs in March – July while the peak season occurs in August – November. According to Hamka and Rais (2016) stated that the fishing season for scad fish (*Decapterus spp*) in Southeast Sulawesi waters using mini purse seine fishing gear is carried out between May - October.

Based on these data, it can be seen that the dominant catch of purse sein vessels has fluctuated where in April the total dominant catch was 690 kg, while in May it decreased by 525 kg, and in June it increased by 735 kg. This condition is caused during the research is a transitional or famine season, this causes fishermen to carry out fishing operations according to weather conditions. This is in accordance with the opinion of Hamar et.al (2020) that the waters of

South Buton from May to July are a season of famine and bad weather/high waves, which causes some purse sein fishermen to choose not to go to sea due to reduced catches.

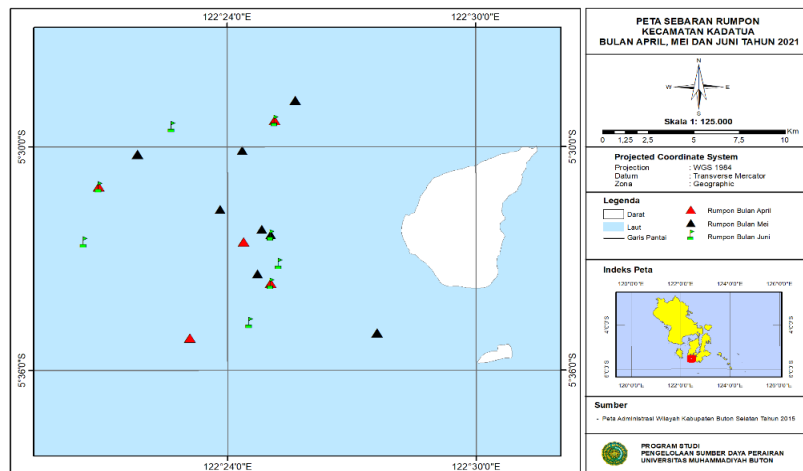


Figure 6. Fishing areas for purse sein fishermen during the study

Based on Figure 6, it can be seen that the distribution of FADs used during the study contained 4 FAD points that were used more than 1 (one) time, namely in April there were 3 FADs which were then used in June, and 1 FAD used in May which was then used in the month of June. This can be indicated if FADs that are used more than 1 (one) time in fishing operations are areas that have abundant fish resources. This is in accordance with the opinion of Nurwahidin & Setianto (2018) which states that the density of FADs in an area can be used as an indication that fish resources in the area are very abundant.

Based on the data in table 2 (attachment 1), it can be seen that the FAD points for purse sein fishermen are located at a distance of 0 – 12 miles (figure 2). While in table 1 it can be seen the coordinates of the distribution of catches in April at a distance of 0-12 miles with the distribution of FAD points at a distance of 0-2 miles by 75 kg and a distance of 2-4 miles by 255 kg and a distance of 4-12 miles by 360 kg, while in May the catch at a distance of 2-4 miles is 235 kg and a distance of 4-12 miles is 290 kg, for June the catch spread at a distance of 2-4 miles is 315 kg and at a distance of 4-12 miles the result is 420 kg.

Based on the description above, it can be seen that the highest level of purse sein effectiveness occurred in June at 735 kg, and was located at a distance of 4-12 miles with a total catch of 1,070 kg from a total catch of 1,950 kg, where that distance is the most common fishing route. has been determined in the regulations issued by the government. According to Permen KP number 18 of 2021, Chapter V article 24 paragraph (b) explains that purse sein vessels with the size of motorized vessels are above 5 – 30 (thirty) GT (gross tonnage) on Fishing Route II (4 – 12 millimetres) in WPPNRI 714.

Conclusion

Based on the results of this study, it can be concluded that the use of FADs by purse seine fishermen is at a distance of 0 - 12 miles and the distribution of the coordinates of the distribution of catches in April is at a distance of 0 - 12 miles with catches at a distance of 0 - 2 miles of 75 kg and a distance of 2-4 miles is 255 kg and a distance of 4-12 miles is 360 kg, while in May the catch at a distance of 2-4 miles is 235 kg and a distance of 4-12 miles is 290 kg, for the month of June the catch distribution at a distance of 2-4 miles, the result is 315 kg and at a distance of 4-12 miles the result is 420 kg. Based on these data, it can be seen that the highest level of purse sein effectiveness occurred in June at 750 kg, and was found at a distance of 4-12 miles with a total catch of 1,070 kg.

Suggestion

Based on the results and conclusions of the research obtained, it is necessary to socialize the regulations regarding the use of FADs and fishing lanes that have been issued by the government.

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