EEC24-19.pdf

by

FILE	EEC24-19.PDF (1.96M)		
TIME SUBMITTED	29-NOV-2019 10:18AM (UTC+0700)	WORD COUNT	8355
SUBMISSION ID	1223459101	CHARACTER COUNT	37959

Eco. Env. & Cons. 24 (4) : 2018; pp. (1590-1603)

ISSN 0971–765X

Feasibility study of cantrang (Danish Trawl): fisheries biology perspective

Sri Suro Adhawati*, Achmar Mallawa, Aris Baso and A. Adri Arief

Faculty of Marine Science and Fisheries, Hasanuddin University
Jl. Pioneers of Independence KM. 10, Makassar 90245, Indonesia

(Received 27 June, 2018; accepted 10 August, 2018)

ABSTRACT

The purpose of this research is to analyze the feasibility of the catch of cantrang in the Strait of Makassar and Bone Gulf after the moratorium policy of the use of fishing equipment in the Fisheries Management Area of the Republic of Indonesia. The research was conducted in August 2016 - July 2017. The research was conducted at 3 locations namely in L1 (Takalar), L2 (Pangkep) and L3 (Palopo). The location of the study was determined deliberately by considering the presence of cantrang and the representation of the waters of Makassar Strait and Bone Gulf. The study sample consisted of 2 types: cantrang and dominant catch fish. The number of samples of cantrang vessels is 73 (seventy-three) both units with classification in L1, 44 (forty-four) both units, in L2, 24 (twenty four) both units and in L3, 5 (five) both units. Fish samples consist of 6 species of dominant fish of catchrang catch that is; *Leiognathus* sp, Parapeneuscyclostenus, *Upeneussulphureus, Clupeaharengus, Sphyraena* sp and *Lethrinuslentjan* the total number of fish samples as many as 1800 heads or 600 heads per research location. Parameters observed include; both size, mesh size nets, fish catch type, fish body circumference, fish body length, fish body weight, and fish gonad condition. Research result; (1) mesh size used by fishermen in the three research sites is smaller than 2 inches. (2) The type of fish catch is a mixture of palagis fish and demersal fish with the number of species as many as 28 species. (3) Lethrinuslentjan at all three locations, entering the catch-catching category with the percentage of catch in mature gonad condition above or greater than 50%. (4) *Sphyraena* sp, *Clupeaharengus, Upeneussulphureus, Parapeneuscyclostenus* and *Leiognathus* sp at all three entry sites in unacceptable caught categories with the percentage of catches under conditions having matured gonads below or below 50%.

Key words : *Capture fish cantrang, Lethrinuslentjan,Sphyraenasp, Clupeaharengus, Upeneussulphureus, Parapeneuscyclostenus and Leiognathussp, Makassar Strait and Bone Bay.*

Introduction

Fish is the main source of daily protein and as a source of income. Over-exploitation, ecosystem modification and international conflict in fish management and trade are a major threat to the long-term sustainability of fisheries. According to Carruthers *et al*. (2014)in developed countries, excessive exploitation causes the condition of global fish stocks to decline. Estimated stock ranges from 10% - 50% according to hunter *et al*. (2015). If fish populations are heavily exploited then fish will be caught before adulthood and tend not to mature gonads.

Fishery resources, are constantly under pressure from various human activities, either directly or indirectly. One of the human activities that can directly cause damage to fishery resources is the use of cantrang fishing gear. According to Stepputtis *et al*. (2016) the selectivity of fishing gear plays an important role in achieving the desired pattern of ex-

***Corresponding author's email :** adhawatiss@gmail.com

ploitation. Non-selective catches cause the immature biota of gonads and spawns cannot breed produce new individuals. If the biota has been caught in small or spawning times, there will be a depletion of stock or a reduction in the stock of fish resources and the catch will diminish.

The catch is not selective (Sudirman, 2008; Mallawa, 2012) cantrang harming small fishermen. Survey Results on Fishermen Nets in Takalar, November 2013, Fishermen who use the longline routing cannot catch fish for 3 days to 1 week if a location has been swept by cantrang pull. If cantrang continues to operate at a location, then other small fishermen cannot catch fish because of the declining fish resources in the region and surrounding areas. Cantrang fishing equipment damaging the environment and marine biota (Habibi 2015) (www.Indonesia 2015). therefore through PERMEN / KP / 2/2015 cantrang tool is prohibited its use.

The pros and cons of the ban on the use of the cangtrang fishing gear from the past has continued to evolve to this day. According to (Yunus, 1994) from the point of view of production, cantrang gives a positive influence on increasing the production and utilization of demersal fish resources with a fairly economically profitable business analysis. Kusnandar (2000) saw from the production function, cantrang in Tegal feasible to be developed. Permana (2003) see from production and production factor, in principle cantrang feasible to be developed. Sutanto (2005) sees from the point of view of technical efficiency, price efficiency and economic efficiency of gillnet and cantrang in Pemalang Regency, the majority of gillnet fishing business has achieved technical efficiency over 80% while the cantrang fishermen achieve technical efficiency between 50 - 80%. Fishing business is still quite profitable, with R / C ratio of 1.32 for gillnet and cantrang 1.18. Wardhani *et al*. (2012) see from the feasibility of fishery business cantrang in fishing port of Tawang Beach. The feasible cantrang continues. Imron (2008) looks at the selectivity of fishing gear. Types of arad, dogol, cantrang and trawl fishing gear are effective but not selective, so that if not managed properly, it may endanger the availability of demersal fish resources. Hapsari & Fitri (2016) sees from a technical point of view, Modification of fishing gear can affect fish catch and fisherman income. Suratissa & Rathnayake (2016) see the problem in general. The cause of habitat destruction is not solely caused by fishing gear but because of the threat of solid waste from industries and households. Lack of human consciousness and decision makers are interrelated threats so that biodiversity damage is far more dangerous.

More specifically Ermawati & Zuliyati (2015) see from the application of PERMEN /KP/ 2/2015. Moratorium on the use of fishing equipment cantrang impact on Social and Economics fishermen. Social impacts include; unemployment rises, the welfare of fishing communities decreases and the high crime. Economic impacts include; decrease in catch, decrease in income. According to Adhawati *et al*. (2017) PERMEN/KP/2/2015 moratorium caused structural unemployment and declining ability of fisherman's purchasing power to fulfill their daily needs. (Sukandar *et al*., 2015) looks at the role of decision makers in relation to the permit of fishing gear and the ban on fishing operations within a certain time (moratorium). Governments need to bear the cost of converting fishing gear which is prohibited to fishing gear which is not prohibited. If this policy is applied consistently, there will be a huge impact in Lamongan, Probolinggo, Jember and Tuban. This is because the proportion of the catch from this prohibited device exceeds 50% of the total catch of the whole tool. It will directly affect the social community of fishermen in some districts / cities.

From the search of the research results of cantrang fishing gear, the study of the impact of moratorium PERMEN/KP/2/2015 biological perspective is still very limited, especially in south Sulawesi. Therefore it is necessary to research about the feasibility of the catch-post-moratorium PERMEN/KP/2/2015 viewed from the perspective of biology in Makassar strait waters and bone gulf of South Sulawesi Province

Goals and usage

This study aims to analyze the feasibility of catch catching equipment cantrang post-moratorium PERMEN/KP/2/2015. viewed from the perspective of biology in Makassar strait waters and bone bay of South Sulawesi Province and the usefulness of the research is as an information material for the development of future fishing gear

Methods

Time and Location Research

The study was conducted in August 2016 - July

2017. The study sites were located at Location 1 (L1) in North Galesong Takalar District, Location 2 (L2) in Podang-podang Island of Pangkep District and Location 3 (L3) in Pontap Kota Palopo. Taking or placing the location is done deliberately by considering the presence of cantrang and representation of Makassar Strait Mainland (L1), Makassar Strait Island Region (L2) and Bay of Bone (L3). As illustrated in Figure 1.

Sampling Technique

The study sample consisted of two parts:

1. Boatcantrang and boat owner. Sampling using census method. The number of samples is equal to the total population of 73 cantrangboat consisting of 44 units in L1, 24 units in L2 and 5 units in L3.
2. Boatcantrang and dominant catch fish. Sampling using simple random sampling method. Samples were taken from cantrang vessels that landed and unloaded catches at fish auction sites (TPI) in L1, L2 and L3. The number of fish used as a sample measuring as much as 120 per catch. Consisting of 20 individuals per unit of research research vessel. Measurements of the fish were cultivated for 5 repetitions, ie in August, September, October, November and December 2016. Thus the total number of samples was 1800 tails (600 heads per study site).

Tools and materials

The tools used to measure the parameters of the study are, meter, electric scales, ruler, knife, scissors, basket / streform. While the materials used are clean water, ice cubes, *Leiognathus* sp, *Parapeneuscyclostenus*, *Upeneussulphureus*, *Clupeaharengus*, *Sphyraena* sp and *Lethrinuslentjan*. The parameters observed include the number of boat size, mesh size nets, types of fish catch, fish body circumference, fish body length, fish body weight, and fish gonad condition.

Data Analysis

To analyze the data used descriptive analysis of quantitative percentage.

Results

Size of Cantrang Nets

Cantrang is used to catch demersal fish. The main part of the cantrang is a net made up of pockets, bodies, wings or feet. The net size and mesh size of the cantrang nets in the three locations varies from Table 1.

The net body is the largest part of cantrang fishing equipment located between the pockets and wings. The wing part is a connection and an extension between the net body with a string of drawings

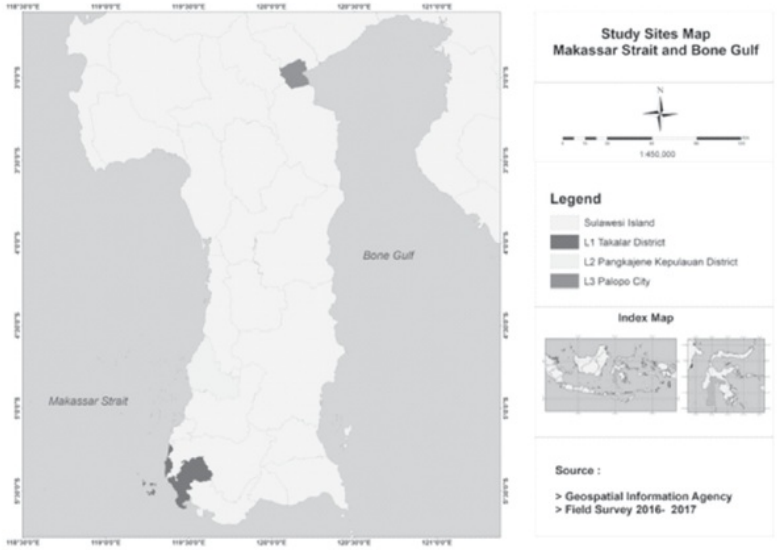

Fig. 1. Map of study sites

Table 1. Net Size and Mesh Size of Cantrang Nets On Location LI (Takalar) L2 (Pangkep) and L3 (Palopo), Year 2017

Location	Size of net			Mesh Size		
	Wing	Body	Bag	Wing	Body	Bag
L1	13	10	13	5"	3"	1.5"
L2	15	10	10	6"	4"	2"
L3	12	10	10	5"	3"	1.5"

that serves as a fish barrier to enter the mouth of the net. The wing mesh size in L1 and L3 is shorter than wing mesh size in L2. For the size of the body net, in all three locations have the same size. Furthermore the size of the bag net in L1 is longer than L2 and L3. For mesh size nets, mesh size wing mesh, body and pockets in L1 and L3 are smaller than mesh size wing nets, body and pockets at L2. Overall of all the cantrang size indicator indicators used in all three locations, the largest net size is in L2 followed by L1 and L3.

The size of a Salambar Rope

The salambar is a rope that is used to stretch and pull the nets at the time of the arrest operation. Salambar rope consists of two parts, namely a salambar of the right and left. Boat sections are connected with wing mesh. The length of the salambar ropes used by fishermen in all three locations; L1, L2 and L3 are relatively the same, respectively 68 rolls (680 meters), 62 roll (620 meters) and 60 roll (600 meters) respectively the diameter of the rope of a sheet used the same, of 3 (three) cm.

Cantrang Both

Boatcantrang on the third location is made of wood. The vessel is used as the main tool for catching activities using cantrang nets. the size of the vessel in all three locations is found in Table 2.

Of the size and width, the size of the vessels used by fishermen in L2 is greater than the size of Boatused by fishermen in L1 and L3. If sorted by largest size, then the largest Boat size is at L2 followed by L3 in second and L1 in third. Conversely, if viewed from the capacity of the Boat, Boat capacity in L1 is greater than the other two locations. In sequence the largest Boat capacity is found in L1, L2 and L3.

Boat Machines

All vessels in the three research sites, using two engines ie the top engine (axle machine) are used to pull the rope salambar and the bottom machine (Boat engine) is used to run the Boat. The engine capacity is the same at the three locations between 150 ps - 300 ps.

Types of Cantrang Fish Catch

Types of cantrang fish in the three research sites are relatively similar. During the study the number of species caught was 28 species. As shown in Table 3 and Figure 2

Of the 28 species, 6 species of which are dominant catch fish in the three locations namely; Peperek (*Leiognathus* sp), ciko-ciko (*Parapeneuscyclostenus*), bijinangka (*Upeneussulphureus*), bobara (*Clupeaharengus*), Barracuda (*Sphyraena* sp) and lencam (Lencrinuslentjan).

Size of Fish of Cantrang Catch

To determine the size of catch fish used 3 parameters namely; total length of fish, fish weight and fish body circumference. These three indicators are common categories used to determine the size of fish.

Table 2. Sizes of Cantrang Boat and Tons of Cantrang Boat On Location LI (Takalar) L2 (Pangkep) and L3 (Palopo), Year 2017

Location	Boat Size (mtr)			Tonnage Boat (ton)	
	Width	Length	High	Gross	Net
L1	15.4	3.4	1.2	24	8
L2	19.6	4.2	1.2	23	8
L3	18.7	3.8	1.2	22	7

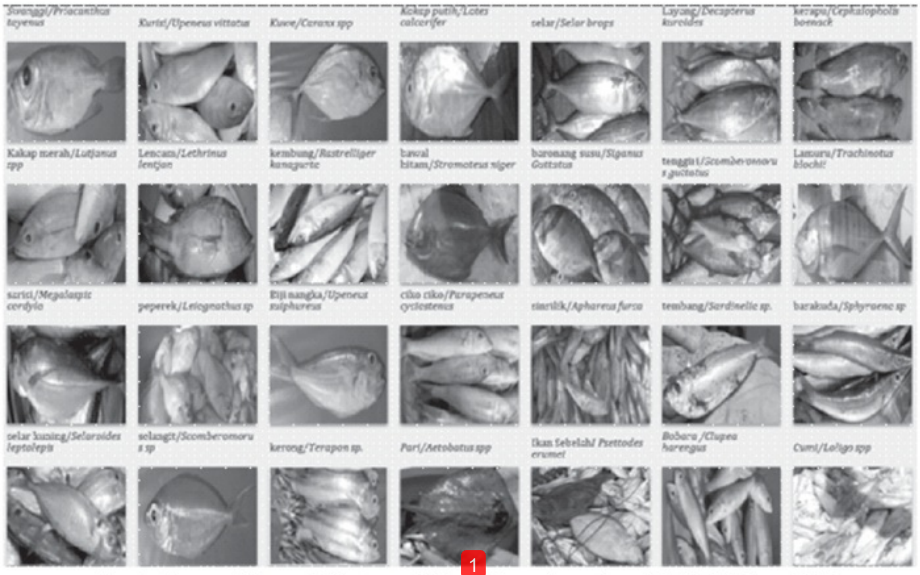

Fig. 2. Types of Canned Cantrang Fish at Three Locations L1, L2, L3 Year 2017

Table 3. Name of Locasl, Common Name and Latin Name of Fish of Catch Cantrang at Location LI (Takalar) L2 (Pangkep) and L3 (Palopo), Year 2017

No	Name of Local	Common Name	Latin Name
1.	Peperek	*Ponyfish*	*Leiognathus sp*
2.	Ciko -Ciko	*Cyclo*	*Parapeneus cyclostenus*
3.	Biji Nangka	*Goat-fish*	*Upeneus sulphureus*
4.	Tembang	*Sardine*	*Sardinella sp.*
5.	Kerung - Kerung	*Lunded grunt*	*Terapon sp.*
6.	Barakuda	*Barracuda*	*Sphyraena sp*
7.	Selangit	*Barred*	*Scomberomorus sp*
8.	Kurisi	*Threadfin brean*	*Upeneus vittatus*
9.	Layang	*Malayan half*	*Decapterus kuroides*
10.	Swanggi	*Purple-spotted bigeye*	*Priacanthus tayenus*
11.	Kuwe	*trevally*	*Caranx spp.*
12.	Selar	*Mackerel*	*Selar brops*
13.	Kembung	*mackerel*	*Rastrelliger kanagurta*
14.	Kakap Putih	*Baramundi*	*Lates calcarifer*
15.	Kakap Merah	*Red snapper*	*Lutjanus spp.*
16.	Lencam	*Emperor*	*Lethrinus lentjan*
17.	Kerapu	*Groupe*	*Cephalopholis boenack*
18.	Bawal Hitam	*Black pomfret*	*Stromateus niger*
19.	Baronang Susu	*White-spotted spinefoot*	*Siganus Guttatus*
20.	Cumi - cumi	*Squid*	*Loligo spp*
21.	Pari	*Sting-ray*	*Aetobatus spp.*
22.	Tenggiri	*Barre spanish mackerel*	*Scomberomorus guttatus*
23.	Lamuru	*Indonesian oil sardine*	*Trachinotus blochii*
24.	Tetengke	*torpedo scad*	*Megalaspis cordyla*
25.	sinrilik	*Small-tooth jobfish*	*Aphareus furca*
26.	Selar Kuning	*Yellow Tail Fish*	*Selaroides leptolepis*
27.	Bobara	*Atlantic herring*	*Clupea harengus*
28.	Ikan sebelah	*Indian halibut*	*Psettodes erumei*

Fish Body Circumference

Based on PERMEN/KP/2/2015 the mesh size allowed for use on the sack is a larger mesh size of 2 inches. So the size of the perimeter mesh or mesh perimeter in the bag is twice the size of the net eye, i.e. ≤ 4 inches. Using the permissible mesh size standard, the results of the measurements as illustrated in Fig. 3 are obtained.

Figure 3 shows that; In L1 there are 3 (three) types of fish have a small body circumference of 2 (two) inches of *Leiognathus* sp as much as 42%, *Upenaussulphureus* 38% and *Sphyraena* sp 44%. In L2 there is 1 (one) type of fish has a small body circumference of 2 (two) inches of *Sphyraena* sp fish of 5%. In L3, there are 4 (four) types of fish that have a body circumference size under 2 (two) inches, namely *Leiognathus* sp fish 6%, *Parapeneus cyclostenus* 8% fish, *Upeneus sulphureus* 50% and *Sphyraena* sp 64%.

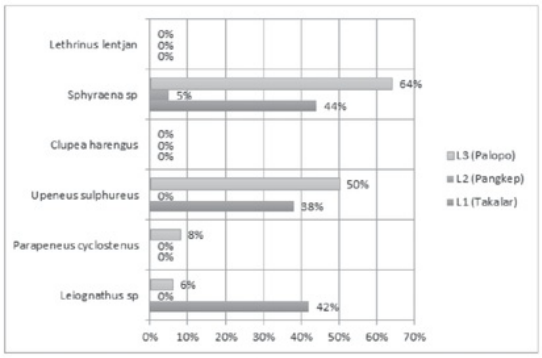

Fig. 3. Fish Body Circumference Caught by Cantrang Smaller Two (cm) at Location L1 (Takalar), L2 (Pangkep) and L3 (Palopo) Year 2017

Long Body Fish

Fish body length is measured from the leading edge of the head to the end of the tail section. Fish body length in the classification in two sizes namely; the smallest body size and the longest body size

Smallest Size

The smallest average size of the net catch fish in the three research sites L1, L2 and L3 is shown in Fig. 4.

Based on data from www.fishbio.com and www.fishbase.org. Average length of fish *Leiognathus* sp 15 cm, *Parapeneuscyclostenus* 18 cm, *Upeneussulphureus* 30 cm, *Clupeaharengus* 40 cm, *Sphyraena* sp> 40 cm and *Lethrinuslentjan*> 50 cm.

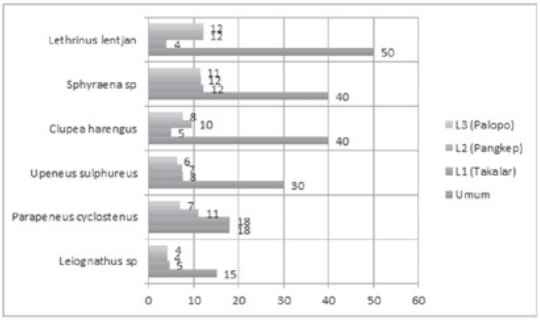

Fig. 4. Smaller Fish Size (cm), Catch of Cantrang at Location L1 (Takalar), L2 (Pangkep) and L3 (Palopo), Year 201

The results of the three locations L1, L2 and L3 showed that from 6 species of fish measured there were only 1 (one) species of fish that have the same size or close that is *Parapeneuscyclostenus* fish with length 18 cm in L1.

Longest Size

The average length of the longest fish caught by the cantrang nets at all three locations L1, L2 and L3 is shown in Fig. 5.

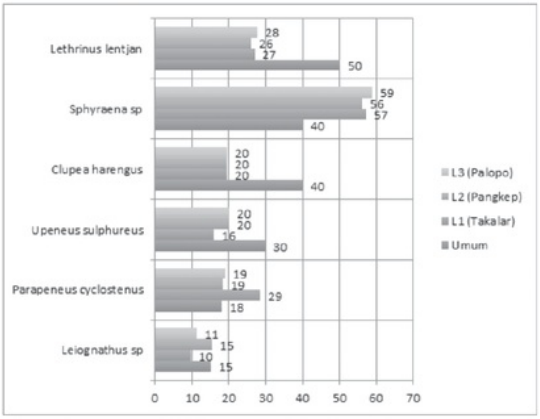

Fig. 5. Longest Fish Size (cm), Catch of Cantrang at Location L1 (Takalar), L2 (Pangkep) and L3 (Palopo), Year 2017

Similarly, the smallest fish size, the longest fish size of the research results in the three locations L1, L2 and L3 shows that of the 6 species of fish measured, there are 3 types have smaller size, 1 type has the same size and 2 types have a longer size. Fish that have smaller sizes are; *Lethrinuslentjan* (standard size > 50 cm) in L1; 27 cm, at L2; 26 cm and in

L3; 28 cm, *Clupeaharengus* (standard size 40 cm) in L1, L2 and L3; 20 cm, *Upeneussulphureus* (standard size 30 cm) in L1; 16 cm, L2 and L3; 20 cm and *Leiognathus* sp (standard size 15 cm) in L1; 10 cm, L3; 11 cm.

Fish that have the same size of *Leiognathus* sp (standard size of 15 cm) in L2; 15 cm.

Fish that has a longer size of *Sphyraena* sp (standard size 40 cm) in L1; 57 cm, L2; 56 cm, L3; 59 cm. And *Parapeneuscyclostenus* (standard size 18 cm) in L1; 29 cm, L2 and L3; 19 cm.

Body Weight Fish

The weight of the fish body is the weight of the fish weighed as a whole. The weight of the fish body in the classification in two sizes namely; weight of fish based on the smallest size and weight of fish based on the longest size.

Fish Weight Based on Smallest Size

Based on the smallest size, most of the cantrang fish weighs above the average weight of the most caught fish as shown in Figure 6.

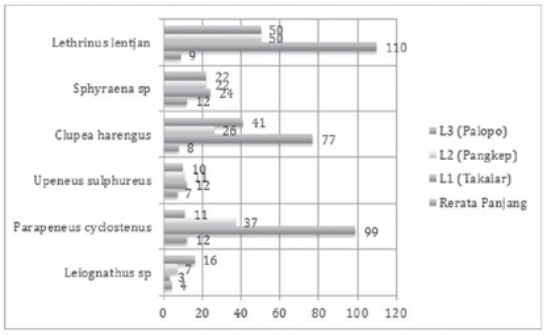

Fig. 6. Smallest Fish Weight (grams), Catch of Cantrang at Location, L1 (Takalar), L2 (Pangkep) and L3 (Palopo), Year 2017

Of the 6 (six) types of fish analyzed by the weight of the smallest fish at all L1, L2 and L3 locations, varied considerably. Based on its type, the fish that has the heaviest size is *Lethrinuslentjan* fish in L1 weighing 110 grams and the smallest is *Leiognathus* sp fish in L1 weighing 3 g. Overall, the comparison of fish length and weights in the three study sites showed a growth imbalance (Figure 2.5). More detailed length and weight of fish are as follows;

Leiognathus sp with each length in L1; 5 cm, in L2 and L3; 4 cm, weighs 3 g, 7 g and 16 g. *Parapeneuscyclostenus* with each length in L1; 18 cm, at L2; 11 cm and in L3; 7 cm weighs 99 g, 37 grams and 11 g. *Upeneussulphureus* with each length in L1; 8 cm in L2; 7 cm and in L3; 6 cm weighs 12 g, 11 g and 10 g. *Clupeaharengus* with each length in L1; 5 cm, L2; 10 cm and L3; 8 cm weighs 77 g, 26 g and 41 g. *Sphyraena* sp with each length in L1; 12 cm, in L2 and L3; 11 cm weighs 24 g and 22 grams in L2 and L3. *Lethrinuslentjan* with their respective lengths in L1; 4 cm, L2; 12 cm, L3; 12 cm, weighing 110 g, 50 g in L2 and L3.

The Longest Fish Size Weight

Based on the longest size caught by the cantrang net, all fish weighed above the average weight of the most caught fish. From 6 (six) types of fish analyzed by weight of fish at all locations L1, L2 and L3, vary widely. Based on its type, the fish that has the heaviest size is *Sphyraena* sp fish in L1 weighing 2,675 grams and the smallest is *Leiognathus* sp fish in L1 weighing 22 g. Overall, the length and weight ratio of fish showed a growth imbalance in the three study sites. length and weight dimensions are illustrated in Figure 7.

Figure 7 shows that; Leiognathussp with each length in L1; 10 cm, L2; 15 cm and L3; 11 cm weighs 22 g, 98 g and 46 g. *Parapeneuscyclostenus* with each length in L1; 29 cm, L2 and L3; 19 cm weighs 288 g, 112 g and 102 g. *Upeneussulphureus* with each length in L1, L2 and L3; 16 cm weighs 56 grams, 193 g and 59 g. *Clupeaharengus* with their respective lengths in L1, L2 and L3; 20 cm, weighs 82 g, 190 g and 143 g *Sphyraena* sp With each length in L1; 57 cm, L2; 56 cm and L3; 59 cm, weighs 2,675 g, 1475 g and 1310 grams. *Lethrinuslentjan* with their respective lengths in L1; 27 cm, L2; 26 cm and L3; 28 cm, weighing 210

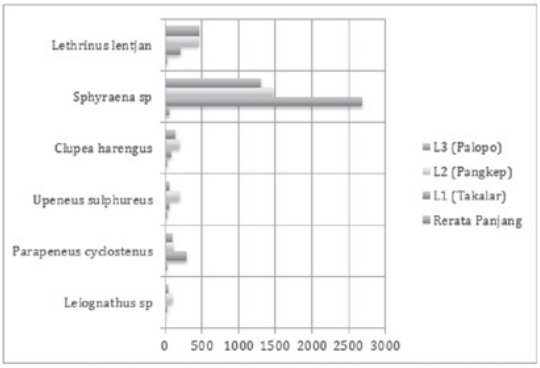

Fig. 7. The Longest Fish Weight (grams), Catch of Cantrang at Location L1 (Takalar), L2 (Pangkep) and L3 (Palopo), Year 2017

grams, 459 g and 459 g.

Condition of Fish Gonad Catch

The indicator used to see the condition of gonad of fish catch is maturity level of gonad catch fish. The total length distribution and percentage of gonad mature fish are as follows:

***Leiognathus* sp**

The results of analysis at the three locations, obtained two long-class sizes of *Leiognathus* sp fish most caught the long classes 6.5 - 8.8 cm and 8.9 - 11.2 cm. The distribution of total length distribution and maturity level of gonads at the three research sites are in Table 4.

In L1, *Leiognathus* sp most caught is size 6.5 - 8.8 cm as many as 66 tail where 22 tail (33%) in mature gonad condition. The total number of fish caught in the mature condition of gonads were 37 (37%) or 63 (63%) of mature gonads.

In L2, *Leiognathus* sp is the most caught is the size of 8.0 - 11.2 cm as many as 60 tail where 24 tail (40%) in mature gonad condition. Total number of fish caught in the mature condition of 42 gonads (42%). or 58 (58%) immature gonads.

In L3, *Leiognathus* sp most caught is the size of 6.5 - 8.8 cm as many as 77 tail where 33 tail (33%) in conditions have matured gonads. Total number of fish caught in the mature condition of 49 gonads (49%) or 51 (51%) immature gonads.

Parapeneuscyclostenus

The results of the analysis on the three locations, obtained two long-class sizes of fish *Parapeneuscyclostenus* the most caught on the 11.4 - 15.7 cm and 20.2 - 24.5 cm long class. The distribution of the total length distribution and maturity level of gonads at the three research sites are in Table 5.

In L1, the most caught *Parapeneus Cyclostenus* is a size of 20.2 - 24.5 cm as many as 65 heads where 27 (27%) in ripe gonads. The total number of fish caught in the mature condition of the gonad was 38 (38%) or 62 (62%) immature gonads

Table 4. Distribution of Long and Mature Distribution Gonad Leiognathus sp Catch of Cantrang at Location L1 (Takalar), L2 (Pangkep) and L3 (Palopo), Year 2017

Classification Length (cm)	Number of Catches (Tail)			Mature Gonad (tail)			% Gonad Mature from Capture Latch Per Classification Length		
	L1	L2	L3	L1	L2	L3	L1	L2	L3
4.1 - 6.4	31	4	4	12	1	1	39	25	25
6.5 - 8.8	66	10	77	22	5	33	33	50	43
8.9 - 11.2	3	60	19	3	24	15	100	40	79
11.3 - 13.5	-	17	-	-	7	-	-	41	-
13.6 - 15.9	-	9	-	-	5	-	-	56	-
Amount	100	100	100	37	42	49			
%	100	100	100	37	42	49			

Table 5. Distribution of Long and Mature Distribution of Parapeneus Fish Gonad Cyclostenus Catch Cantrang at Location L1 (Takalar), L2 (Pangkep) and L3 (Palopo), Year 2017

Classification Length (cm)	Number of Catches (Tail)			Mature Gonad (Tail)			% Gonad Mature from Capture Latch Per Classification Length		
	L1	L2	L3	L1	L2	L3	L1	L2	L3
7.0 - 11.3	-	7	30	-	4	15	-	57.1	50.0
11.4 - 15.7	-	66	61	-	32	32	-	48.5	52.5
15.8 - 20.1	17	27	9	8	8	4	47.1	29.6	44.4
20.2 - 24.5	65	-	-	27	-	-	41.5	-	-
24.6 - 28.9	18	-	-	3	-	-	16.7	-	-
Amount	100	100	100	38	44	51			
%	100	100	100	38	44	51			

In L2, the most caught *Parapeneus Cyclostenus* is the size of 11.4 - 15.7 cm of 66 in which 32 (32%) have been mature gonads. The total number of fish caught in gonad condition is 44 (44%) or 56 tail (56 %) immature gonads

In L3, the most caught *Parapeneus Cyclostenus* is a size of 11.4 - 15.7 cm of 61 in which 32 (32%) in ripe gonads. Total number of fish caught in mature condition 51 gonads (51%) or 49 tail (49%) immature gonads

Upeneussulphureus

The result of analysis at the three locations, one long class of *Upenaussulphureus* fish was caught in the 12.0 - 14.8 cm long class. The total distribution distribution and the maturity level of gonad at the three study sites were found in Table 6

In L1, the most caught *Upenaussulphureus* is 12.0 - 14.8 cm in size as many as 40 in which 25 (63%) have been ripe gonads. The total number of fish caught in the condition has matured gonad 66 tail (66%) or 24 tail (34%) immature gonad.

In L2 *Upeneussulphureus* is the most caught is the size of 12.0 - 14.8 cm as many as 49 tail where 24 tail (49%) in conditions have matured gonads. The total number of fish caught in the condition has matured 46 gonads (46%) or 54 head (54%) immature gonads.

In L3, *Upenaussulphureus* is most caught is the size of 12.0 - 14.8 cm as many as 30 tail where 18 tails (60%) in conditions have matured gonads. The total number of fish caught in the condition has matured gonad 43 tail (43%) or 57 tail (57%) immature gonad

Clupeaharengus

The results of the analysis on the three locations, obtained two long-class size of *Clupeaharengus* fish most caught on the class length 14.0 - 16.9 cm and 17.0 - 19.9 cm. The distribution of total length distribution and maturity level of gonads at the three study sites are in Table 7.

In L1, the most caught *Clupeaharengus* is the size of 17.0 - 19.9 cm as many as 52 tails where 12 tails

Table 6. Distribution of Long and Mature Distribution of Uponus Fish Gonad sulphureus Catch of Cantrang at Location L1 (Takalar), L2 (Pangkep) and L3 (Palopo) Year 2017

Classification Length (cm)	Number of Catches (Tail)			Mature Gonad (Tail)			% Gonad Mature from Capture Latch Per Classification Length		
	L1	L2	L3	L1	L2	L3	L1	L2	L3
6.2 - 9.0	20	2	27	13	1	11	65	50	41
9.1 - 11.9	32	19	21	20	6	12	63	32	57
12.0 - 14.8	40	49	30	25	24	18	63	49	60
14.9 - 17.7	8	25	17	8	12	2	100	48	12
17.8 - 20.6	-	5	5	-	3	-	-	60	-
Amount	100	100	100	66	46	43			
%	100	100	100	66	46	43			

Table 7. Distribution of Long and Moor Distribution of Cloned Gonad Fish harengus Catch of Cantrang at Location L1 (Takalar), L2 (Pangkep) and L3 (Palopo) Year 2017

Classification Length (cm)	Number of Catches (Tail)			Mature Gonad (Tail)			% Gonad Mature from Capture Latch Per Classification Length		
	L1	L2	L3	L1	L2	L3	L1	L2	L3
5.0 - 7.9	2	-	3	-	-	2	-	-	66.7
8.0 - 10.9	2	1	6	1	-	3	50.0	-	50.0
11.0 - 13.9	-	5	39	-	3	13	-	60.0	33.3
14.0 - 16.9	44	80	40	20	32	12	45.5	40.0	30.0
17.0 - 19.9	52	14	12	12	4	2	23.1	28.6	16.7
Amount	100	100	100	33	39	32			
%	100	100	100	33	39	32			

(23.1%) are in ripe gonad condition. The total number of fish caught in the ripe condition of 33 gonads (33%) or 67 (67%) have not matured gonads.

In L2 Clupea the most caught harengus is the size of 14.0 - 16.9 cm as many as 80 tails where 32 tails (40%) are in ripe gonad condition. Total number of fish caught in conditions have matured 39 gonads (39%) or 61 (61%) immature gonads

In L3, the most caught *Clupeaharengus* is the size of 14.0 - 16.9 cm as many as 40 tail where 12 tail (30%) in condition have ripe gonads. Total number of fish caught under conditions have matured 32 (32%) or 68 (68%) gonads have not matured gonads.

***Sphyraena* sp**

The results of analysis at the three locations, obtained a long class size of *Sphyraena* sp fish most caught on the 11.4 - 20.9 cm long class. The distribution of the total length distribution and maturity level of gonads at the three study sites are in Table 8.

In L1, *Sphyraena* sp is the most caught is the size of 11.4 - 20.9 cm as many as 56 tail where 15 tails (27%) in conditions have matured gonads. The total number of fish caught in the condition has matured 32 (32%) or 68 (68%) gonads have not matured gonads.

In L2 *Sphyraena* sp is the most caught is the fish with the size of 11.4 - 20.9 cm as many as 68 tail where 20ekor (29%) in conditions have matured gonads. The total number of fish caught in the condition was ripe gonad 34 tail (34%) or 66 tail (66%) immature gonad.

In L3, *Sphyraena* sp is the most widely caught fish with the size of 11.4 - 20.9 cm as many as 84 tails where 23 tails (27%) in conditions have matured gonads. The total number of immature fish gonad 39 tail (39%) or 61 tail (61%) immature gonad.

Lethrinuslentjan

The results of analysis at the three locations, obtained two long-class size of *Lethrinuslentjan* fish most caught on the 12.0 - 15.1 cm and 18.4 - 21.5 cm long classes. The distribution of the total length distribution and maturity level of the gonads at the three study sites is shown in Table 9.

In L1, *Lethrinuslentjan* is the most caught is the size of 18.4 - 21.5 cm as many as 54 tail where 27 tails (50%) in conditions have matured gonads. The total number of fish caught in the condition was ripe gonad 57 tail (57%) or 43 tail (43%) immature gonad.

In L2 *Lethrinuslentjan* is the most caught is the size of 12.0 - 15.1 cm as many as 43 tail where 26 tails (60.5%) in conditions have matured gonads. The total number of fish caught in conditions has matured 55 (55%) or 45 (45%) mature gonads

In L3, *Lethrinuslentjan* is the most caught size 18.4 - 21.5 cm as many as 40 tail where 27 tails (67.5%) in conditions have matured gonads. The total number of fish caught under conditions has matured 54 gonads (54%) or 46 (46%) immature gonads

Eligibility of Catch of Cantrang

Based on the sixth gonad condition of dominant catch fish (Table 4, 5, 6, 7, 8, 9), the overall percentage of the catchability of the species per study area is illustrated in Figure 8.

Lethrinuslentjan at the three sites L1, L2 and L3 enter in the catchable category where the percentage of the number of fish caught in the condition has matured gonads above or greater than 50%. *Sphyraena* sp in all three locations L1, L2 and L3 fall into the unfit catch category where the percentage of

Table 8. Distribution of Long and Mature Distribution of Gonad Fish Sphyraena sp Catch of Cantrang at Location L1 (Takalar), L2 (Pangkep) and L3 (Palopo) Year 2017

Classification Length (cm)	Number of Catches (Tail)			Mature Gonad (Tail)			% Gonad Mature from Capture Latch Per Classification Length		
	L1	L2	L3	L1	L2	L3	L1	L2	L3
11.4 - 20.9	56	68	84	15	20	23	27	29	27
21.0 - 30.5	37	26	4	10	8	4	27	31	100
30.6 - 40.1	-	1	4	-	1	4	-	100	100
40.2 - 49.7	2	3	5	2	3	5	100	100	100
49.8 - 59.3	5	2	3	5	2	3	100	100	100
Amount	100	100	100	32	34	39			
%	100	100	100	32	34	39			

Table 9. Distribution of Length and Length of Gonad Fish Lethrinus lentjan Captured Cantrang at Location L1 (Takalar), L2 (Pangkep) and L3 (Palopo) Year 2017

Classification Length (cm)	Number of Catches (Tail)			Mature Gonad (Tail)			% Gonad Mature from Capture Latch Per Classification Length		
	L1	L2	L3	L1	L2	L3	L1	L2	L3
12.0 - 15.1	4	43	14	3	26	6	75.0	60.5	42.9
15.2 - 18.3	17	35	25	16	11	7	94.1	31.4	28.0
18.4 - 21.5	54	13	40	27	9	27	50.0	69.2	67.5
21.6 - 24.7	22	6	16	8	6	10	36.4	100.0	62.5
24.8 - 27.9	3	3	5	3	3	4	100.0	100.0	80.0
Amount	100	100	100	57	55	54			
%	100	100	100	57	55	54			

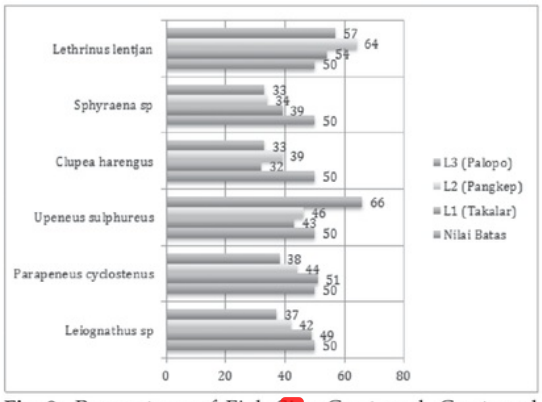

Fig. 8. Percentage of Fish Size Captured, Captured Cantrang at Location L1 (Takalar), L2 (Pangkep) and L3 (Palopo) Year 2017

the number of fish caught in the condition has matured gonads below or less than 50%. *Clupeaharengus* at the three locations L1, L2 and L3 enter in the unfit catch category where the percentage of the number of fish caught in the condition has matured gonad below or less than 50%. *Upeneussulphureus* at the three sites L1, L2 and L3 fall into the unfit catch category where the percentage of the number of fish caught in the condition has matured gonads below or less than 50%. *Parapeneuscyclostenus* at two sites L1, L2 enter in the unfit catch category where the percentage of the number of fish caught in the condition has matured gonad below or less than 50%. While at location L3 enter in catch catching category where percentage number of fish caught in condition have matured gonad above or greater than 50%. *Leiognathus* sp at the three sites L1, L2 and L3 fall into the unfit catch category where the percentage of the number of fish caught in the condition has matured gonads below or less than 50%. Thus the overall feasibility of the catch of cantrang in the three research sites L1, L2 and L3 included in the category not yet fit to catch.

Discussion

Environmental characteristics cause spatial differences with each other (Milligan *et al.* 2016). In the three study sites characteristic differences caused significant differences in the specification of the cantrang fishing equipment used. From the length, width and height of the ship, the cantrang boats in L1 are smaller than the cantrang boats in L2 and L3. However, from the tonnage of the vessel, the GT (gross tone) L1 vessel is larger than GT of the L2 and L3 vessels. This difference occurs because of differences in travel time from location to location of capture. The average travel time required by L1 fishermen is longer than the time required by L2 and L3 fishermen. The total time it takes the L1 fishermen to go back to the fishing ground 14 - 16 hours while the fishermen in L2 and L3 only takes 8-10 hours. L1 fishermen do catching at night while fishermen L2 and L3 make arrests in the morning / afternoon.

From the net size used, the whole of the cantrang webs in L1 and L2 is longer than the net used in L3. But instead of mesh size mesh size. L1 and L3 have mesh size smaller than L2. According to Norcross *et al.* (2013) Mesh size mesh size used affects the number and size of fish caught. The results showed that there was a correlation between the mesh size of the net used and the size of the fish caught. Based on PERMEN-KP / 2/2015 about the moratorium of cantrang fishing gear, meise size of pouch that is allowed to be used is meise size with larger size equal to 2 inches. So that the circumference of the

mesh or mesh perimeter in the bag is twice the size of the mesh, ie, ≤ 4 inches. In the three research sites, especially on L1 and L3, there are fish catches of cantrang with smaller size 4 cm or below the perimeter mesh line. Should the size of the fish caught will be larger than 4 inches. This is in line with the opinion of Leo (2010) in general fish caught, the size of the body circumference greater than the circumference of the net used. Fish whose body circumference is larger than the circumference of the net's eye, will not be able to pass through the net. Fish will hit the net or fish will get caught in the net eye. On that basis, the cantrang nets in all three locations are included in the prohibited categories based on PERMEN/KP/2/2015

Subsequently by type, the catchrang fish is varied and is a mixture of pelagic fish and demersal fish. This is because the way the cantrang fishing equipment operation sweeps from the bottom of the waters to just behind the fishing boat, so cantrang can encompass all species of fish both pallagic fish and demersal fish. According to the Department of Marine Affairs and Fisheries cantrang catch target can reach 48 species. The results of Mallawa *et al.,* (2005) catchrang catches 21 species (in Mallawa, 2012) In the three research sites the average number of fish caught reaches 28 species, there is relatively no difference in the type of fish caught, the only difference concerning the number and size of the dominant catch.

The classification of the size of catchrang fish in the three research areas varied. Fish with the smallest size are *Leiognathus* sp fish with size classification between 4 - 15 cm, and fish with longest size is *Sphyraena* sp with classification 11 - 59 cm. *Parapeneuscyclostenus* fish have length of 7 - 29 cm, *Upeneussulphureus* fish between 6 - 20 cm, *Clupeaharengus* fish 5 - 20 cm, and *Lethrinuslentjan* 4 - 28 cm.

Based on the classification of the length size, in detail the average size of the most caught fish type of research location that is;

In L1; *Leiognathus* sp 6.5 - 8.8 cm, *Parapeneuscyclostenus* size 20.2 - 24.5 cm, *Upeneussulphureus* 12.0 - 14.8 cm, *Clupeaharengus* 17.0 - 19.9 cm, *Sphyraena* sp 11.4 - 20.9 cm, *Lethrinus* lentjan 18.4 - 21.5 cm.

In L2: *Leiognathus* sp 8.9 - 11.2 cm, *Parapeneuscyclostenus* 11.4 - 15.7 cm, *Upeneussulphureus* 12.0 - 14.8 cm, *Clupeaharengus* 14.0 - 16.9 cm, *Sphyraena* sp 11.4 - 20.9 cm, *Lethrinuslentjan* 11.4 - 20.9 cm.

In L3; *Leiognathus* sp 6.5 - 8.8 cm, *Parapeneuscyclostenus* 11.4 - 15.7 cm, *Upeneussulphureus* 12.0 - 14.8 cm, *Clupeaharengus* 14.0 - 16.9 cm, *Sphyraena* sp 11.4 - 20.9 cm, *Lethrinuslentjan* 12.0 -15.1 cm

Based on the data at www.fishbase.org (2016) the size of *Leiognathus* sp fish most caught is 15 - 18 cm, *Parapeneuscyclostenus* 18 cm fish, *Upeneussulphureus* fish 30 cm, Clupeaharengus fish 40 cm, *Sphyraena* sp> 40 cm and *Lethrinuslentjan*> 50 cm. On the basis of this, the average of cantrang catch fish in the three research sites is categorized as small or below the standard size of the most caught fish.

Sudirman *et al*. (2008) measured the length of *Leiognathus* sp fish and *Upeneussulphureus* fish caught by cantrang in the waters of the Makassar Strait. The published results, the long classification of *Leiognathus* sp 9.2 cm - 11.7 cm and the most widely caught size are 9.7 cm - 10.2 cm. the size of the first mature gonad 9.8 cm. percentage of gonad matured 91.11%. Furthermore, *Upenaussulphureus* fish is the most caught 13.9 - 14.9 cm. the size of the first time ripe gonad 16.9 cm. percentage of mature gonad 3.56%.

In the period of 9 years (2008 - 2017) there was a significant change in the size of *Leiognathus* sp fish in Makassar Strait waters. The result of the research using the same indicator that is the size of the length, the most caught size, the first size of mature gonad and the percentage of mature gonads, shows that the size of *Leiognathus* sp fish and *Upeneussulphureus* fish caught in Location L1 is smaller than the results of Sudirman 7 in 2008.

Similarly, what happens in the waters of Bone Bay (Pertiwi, 2011) measured the length of *Leiognathus* sp fish and *Upeneussulphureus* fish in the waters of Bone Bay. The results obtained, the classification of long fish *Leiognathus* sp 7 - 19 cm and the size of the most caught is the size of 8.1 - 8.9 cm. the size of the first time ripe gonad 8.5 cm. Furthermore, the classification of fish length *Upeneussulphureus* 7 - 15 cm and the size of the most caught 9.1 - 10 cm. the size of the first time ripe gonad 8 cm.

In the period of 6 years (2011 - 2017) there was a significant change in the size of *Leiognathus* sp fish in the waters of Bone Bay. The results of the study using the same indicator that the size of the length, the size of the most caught, the first size of mature gonad and the percentage of mature gonads, showed that the classification of fish sizes

Leiognathus sp and *Upeneussulphureus* fish caught in Location L3 is smaller than Pratiwi research results in year 2011.

Permatachani *et al*. (2016) also measured the *Leiognathus* sp fish found in the waters of the Sunda Strait. The results obtained show significant differences. *Leiognathus* sp fish in the first Sunda strait gonad (Length at first maturity) at 11.7 - 14.6 cm in size was well above the size of *Leiognathus* sp in all three sites.

Hunter *et al*. (2016) analyzed the change in the average length of demersal fish caught as a whole in Scotland from 1960 - 2009. Within 49 years. The decline in the average length of demersal fish from 40 cm in 1960 dropped to 20 cm in 2009. This average change in length was due to the use of trawler fishing tools that led to changes in demersal fish growth rates and correlates to the decrease in the number of large fish caught.

From the weight of the fish caught fish in all three locations have significant weight differences. From the smallest length of *Lethrinus* Fish lentjan is a fish that has the heaviest weight while from the longest size that has the heaviest weight is actually the fish *Sphyraena* sp. In the three research sites *Sphyraena* sp fish weight reached more than 1,000 g (1kg) even in L1 weight *Sphyraena* sp fish reached 2.675 g (2.675 kg). This indication explains that from the smallest size and seen from the longest measure, there is an imbalance of fish growth between one location and another.

Conclusion

The feasibility of catchrapcatchrang at the three locations entered in the category not yet captured. From 18 observation points (6 species of fish from 3 locations) were analyzed, there were only 5 points from three locations and three fish catches with percentage above 50%, ie *Parapeneuscyclostenus* fish (51%) in L1, *Upeneussulphureus* Fish (66 %) in L3 and *Lethrinuslentjan* fish in the three locations L1, L2 and L3 respectively by 54%, 64% and 57%.

Acknowledgements

I would like to thank Kasim Alwi for the help of the research fund. Dewi Yasin and Nita Rukminasari for helping us with the editing of the manuscript. Sri Nurul Rianawati as a village supervisor Takalar Regency, Andi Nasrun Head of village Podang-Podang Pangkep Regency, Arsyad Head of Fishermen Cantrang Association, South Sulawesi. Niken Nur Kasim as a Sakkervillage supervisorSouth Sulawesi, Also thanks to faridkasimand the coordinator unit O'seaNormawati, and the staff who helped us to collect data in the field.

References

Adhawati, S.S. 2017. Comparative Study of Economic Value Post Cantrang Moratorium on the Waters of the Gulf of Bone and Makassar Straits , South Sulawesi Province. *International Journal of Oceans and Oceanography*. 11 (2) : pp.201–215. Available at: http://www.ripublication.com.

Carruthers, T.R. 2014. Evaluating methods for setting catch limits in data-limited fisheries. *Fisheries Research*. 153: 48–68.

Ermawati, N. and Zuliyati, 2015. Socio-economic impact of implementing Ministry of Marine and Fisheries Affair Act Number 2/PERMEN-KP/2015. In *Multidicipline National Seminar Proceeding and Call For Papers Unisbank (SENDI-U)*. pp. 978–979.

Habibi, A. 2015. Trawl treatening a marine resources. *www.indonesia*, pp. 9–11. Available at: http://www.wwf.or.id/tentang_wwf/upaya_kami/marine/?uNewsID=37423.

Hapsari, T.D. and Fitri, A.D.P. 2016. Technical and Economic Analysis of Modified Payang Fishing Gear in the Fishing Port of Tawang Beach in Kendal District, Indonesia. *Aquatic Procedia*. 7 : 254–264. Available at: http://linkinghub.elsevier.com/retrieve/pii/S2214241X16300578.

Hunter, A., Speirs, D.C. and Heath, M.R. 2015. Fishery-induced changes to age and length dependent maturation schedules of three demersal fish species in the Firth of Clyde. *Fisheries Research*. 170 :14–23.

Hunter, A., Speirs, D.C. and Heath, M.R. 2016. Investigating trends in the growth of five demersal fish species from the Firth of Clyde and the wider western shelf of Scotland. *Fisheries Research*. 177 :71–81.

Imron, 2008. Utilization fish demersal resouces sustainably at Tegal Waters, Central Java.

Kusnandar, 2000. Cantrang fisheries at Tegal and its development (Local magazine)

Leo, A.A. 2010. Fish composition of cantrang fisheries at Brondong Waters, Lamongan Regency, East Java. Bogor Agriculture Unversity (Thesis).

Mallawa, A. 2012. Basic Fisheries I., Masagena Press.

Milligan, R.J. 2016. Fish communities associated with cold-water corals vary with depth and substratum type. *Deep-Sea Research Part I: Oceanographic Research Papers*. 114 : 43–54.

Norcross, B.L. 2013. Northeastern Chukchi Sea demersal fi shes and associated environmental characteristics,

2009 – 2010. *Continental Shelf Research.* 67 : 77–95.
Permana, 2003. Production analysis of cantrang fisheries at Tegal Regency (Local report)
Permatachani, A., Boer, M. and Kamal, M.M. 2016. Stock assessment Leiognathus equulus based on Rampus net at Sunda Bay. *Journal of Fisheries and Marine Technology*. 7 (2) : 107–116. (Local journal).
Pertiwi, W. 2011. Species composition and fish size that cought by beach seine and Sero at Palopo Waters, South Sulawesi Komposisi Jenis Dan Ukuran Ikan Yang Tertangkap Dengan Sero Dan Pukat Pantai Di Perairan Kota Palopo Provinsi Sulawesi Selatan. p. 68.
Stepputtis, D. 2016. Broadening the horizon of size selectivity in trawl gears. *Fisheries Research*. 184 :18–25.
Sudirman, 2008. Paradigm toward environmental friendly fishing acitivities as implemetation of sustainable fisheries development, Makassar (Report).
Sukandar 2015. Academic study on Ministry of Marine and Fisheries Affair Act number 2/2015 about prohibited for using several fishing gear at Fisheries Management Region of Republic of Indonesia.
Suratissa, D.M. and Rathnayake, U.S. 2016. Diversity and distribution of fauna of the Nasese Shore, Suva, Fiji Islands with reference to existing threats to the biota. *Journal of Asia-Pacific Biodiversity.* 9 (1) : 11–16.
Sutanto, H.A. 2005. Efficiency analysis of gill net and cantrang fishing gear. Repository Diponegoro University, Semarang.
Wardhani, R.K., Ismail and Rosyid, A. 2012. Business analysis of cantrang fishing gear (Boat Seine) at Fishing Port, Tawang Beach, Kendal Regency. *Journal Of Fisheries Resources Utilization Management and Technology*. 1 Nomo : 67–76.
Www.fishbase.org, 2016. Fish Identification/ : Find Species 102 Species of Family Auchenipteridae. *http://www.fishbase.org/identification/specieslist.php?famcode=362&reacode*, p.1 of 28.
Yunus, 1994. Cantrang fisheries and its fisheries aspect (Case study at Pemalang).

EEC24-19.pdf

ORIGINALITY REPORT

%6	%4	%1	%3
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	www.bioflux.com.ro Internet Source	%3
2	Submitted to Universitas Brawijaya Student Paper	%1
3	Submitted to Universitas Hasanuddin Student Paper	%1
4	Submitted to Lutheran High School Student Paper	<%1
5	www.envirobiotechjournals.com Internet Source	<%1
6	Submitted to Western Michigan University Student Paper	<%1
7	Submitted to Universiti Sains Malaysia Student Paper	<%1
8	Iain McKechnie. "Investigating the complexities of sustainable fishing at a prehistoric village on western Vancouver Island, British Columbia, Canada", Journal for Nature Conservation, 2007 Publication	<%1

9	S. Adjerid, M. Aiffa, J.E. Flaherty. "Hierarchical finite element bases for triangular and tetrahedral elements", Computer Methods in Applied Mechanics and Engineering, 2001 Publication	<%1
10	eafm-indonesia.net Internet Source	<%1
11	"18th International Congress of the European Association for Endoscopic Surgery (EAES) Geneva, Switzerland, 16–19 June 2010", Surgical Endoscopy, 2011 Publication	<%1
12	Logerwell, E., M. Busby, C. Carothers, S. Cotton, J. Duffy-Anderson, E. Farley, P. Goddard, R. Heintz, B. Holladay, J. Horne, S. Johnson, B. Lauth, L. Moulton, D. Neff, B. Norcross, S. Parker-Stetter, J. Seigle, and T. Sformo. "Fish communities across a spectrum of habitats in the western Beaufort Sea and Chukchi Sea", Progress In Oceanography, 2015. Publication	<%1
13	jivp-eurasipjournals.springeropen.com Internet Source	<%1

EXCLUDE QUOTES	ON	EXCLUDE MATCHES	< 5 WORDS
EXCLUDE BIBLIOGRAPHY	ON		