

## A COMPARISON OF CATCHABILITY BETWEEN “ARAD” (OTTER BOARD BOAT SEINE) OPERATED WITH AND WITHOUT TURTLE EXCLUDER DEVICES (TEDs)

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### ABSTRACT

*The use of TEDs on the “Arad” (Otter Board Boat Seine Net) has never been done by fishermen from the northern part of the Java Sea in Central Java. In order to introduce this net and also to anticipate the shrimp embargo by World Trade Organization (WTO. TEDs construction used in this study was Hooped TEDs with LxBxD dimension of 60x 40 x 60 cm; width of grids deflector of 5 cm) . This construction made an angle of 45°. Fishing operation with and without TEDs was done 9 times during the day. Shrimp, fish, others and garbage entering the net were measured in terms of body weight and fish body circle was also measured in order to compare the result of each treatment. Both nets (with and without TEDs) contained Shrimp (*Metapenaeus sp*), Pilot-fish (*Selaroides sp*), Mackerel (*Rastrelliger sp*), Hair-tails (*Trichiurus sp*, Pony-fish(*Leiognathus sp*), others and garbage. The average catch every hauling for the net with TEDs were : Shrimp 1.17 kg; Fish 1.66 kg; others 0.14 kg and garbage 0.1 kg; whereas the net without TEDs were : Shrimp 1.09 kg; Fish 2.33 kg, others 0.34 kg and garbage 1.31 kg. The average body circle of fish caught by net with TEDs was 4.0-7.4 cm and those caught by net without TEDs was 4.0-8.9 cm. The amount of fish and garbage caught by using each treatment differed very significantly, while the amount of shrimp caught did not.*

**Key words:** “Arad” (Otter Board Boat Seine), Hooped TEDs

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### INTRODUCTION

The use of Turtle Excluder Device (TEDs) is very popular due to the US shrimp import embargo that went into effect on 1<sup>st</sup> May 1996, which stipulates that fishing methods used in shrimp capture in harvesting countries should inflict no harm on sea turtles. To comply with these conditions, the Southeast Asian Development Center (SEAFDEC), together with its member countries, conducted a series of experiments and trials to develop a suitable device, namely

the TEDs for installation in shrimp trawls in Southeast Asian Countries. Four series of experiments were carried out in Thailand, Malaysia, Philippines and Brunai Darussalam.

The By-catch Excluder Device (BEDs) is the Indonesian term for TEDs firstly developed by the National Marine Fisheries Service (NMFS), Mississippi Laboratory, NOAA, USA, and introduced to Indonesia in 1982. The TEDs were specially designed to exclude endangered sea turtles, in addition to other large unwanted by-catch, such as garbage, jelly

fish, spones, sharks and rays from the trawl net during towing.

In Indonesia, the research about TEDs which function as BEDs was done in 1992 on the trawl net at Cilacap water (Central Java) and followed in 1997 at Arafura Sea.

After the Indonesian government banned trawl fishing throughout the country in 1980, many fishermen from the north coast of Central Java switched to Boat Seine net (Danish Seine) as a substitute for the trawl net.

The purpose of using Boat Seine is to catch the shrimp, so that the operation was carried out in the coastal area, where waste product/ garbage can be found because of its proximity to land. Therefore, the use of TEDs can be applied to anticipate the shrimp embargo by World Trade Organization (WTO) and also to improve the quality and make the handling easier because of the reduction of waste products/garbage that entered into codend net.

This study was aimed to find out information on the amount and types of catch which resulted and also the body circle of each fish species caught by Arad net (Otter Board Boat Seine) operated with TEDs compared to those caught without TEDs at Demak Waters (Central Java). This report could be the first information about the modification of Boat Seine Net which is operated using otter board and TEDs at the northern part of Coastal Java.

## **MATERIALS AND METHODS**

Experimental fishing operations were conducted in October 1998 at an area approximately 2 nautical miles from the

coastal line at a depth of 10-15 meters around the Demak Waters (Central Java). The vessel used has a dimension of: L x B x D = 7.5 x 2.5 x 0.9 m made of teak wood with a 15-hp diesel engine. The net has a head rope and ground rope of 9.70 and 10.90 m in length, respectively. Each has a 75-meter towing rope. The type of TEDs used was Hooped TEDs with the dimension: L x B x D = 60 x 40 x 60 cm, width of grids deflector of 5 cm and made an angle of 45°. Otter Board was made from teak wood, with dimension; L x B x D = 80 x 40 x 2 cm, fixed on each end part of net wings. Fishing operation took place during the day with the net circled by the vessel, after which, when it fully circled then the net was pulled from each towing rope together with a winch. Fishing operation was done 9 times repeatedly. Each repetition was done using TEDs and without TEDs.

The catch results was monitored and the amount and kind of catch as well as the body circle of fish of each species were weighted and measured and then compared to one another (using TEDs and without TEDs) by t-test.

The catch result of the net with and without TEDs contain the same species such as: Shrimp (*Metapenaeus sp*), Pilot-fish (*Selaroides sp*), Mackerels (*Rastrelliger sp*), Hair-tails (*Trichiurus sp*) and Pony-fish (*Leiognathus sp*)

The weight of fish caught by the two treatment (with and without TEDs) calculated using t-test showed that the results differed very significantly. The average catch of the operation with TEDs was 1.66 kg per hauling, smaller than without TEDs (2.33 kg per hauling), but for the shrimp.

**Table 1.** Average Catch of fish and others with and without TEDs

Names	Average catch (kg/hauling)	
	With TEDs	Without TEDs
Shrimp :		
- <i>Metapenaeus sp</i>	1.17	1.09
Fish :	<u>1.66</u>	<u>2.33</u>
- Pilot-fish ( <i>Selaroides sp</i> )	0.51	0.77
- Mackerels ( <i>Rastrelliger sp</i> )	0.69	1.09
- Hair-tails ( <i>Trichiurus sp</i> )	0.33	0.34
- Pony-fish ( <i>Leiognathus sp</i> )	0.13	0.13
Others	0.14	0.34
Garbage/ trash	0.10	1.31

**Table 2.** Body circle and average weight of fish caught with and without TEDs

Names	Body circle range (cm)		Average weight (gr/individu)	
	With TEDs	Without TEDs	With TEDs	Without TEDs
- Pilot-fish	4.0 – 6.4	4.0 – 8.9	68.66	44.80
- Mackerels	4.0 – 6.9	4.0 – 8.9	65.26	125.64
- Hair-tails	4.0 – 7.4	5.0 – 7.9	88.24	140.90
- Pony-fish	4.0 – 6.9	5.0 – 7.9	50.00	57.14

## RESULT AND DISCUSSION

The weight of each fish, shrimp species and also garbage/trash of the catch in every net hauling with and without TEDs can be seen in **table 1**.

Body circle and average individual weight for every species caught by the net with and without TEDs can be seen in **table 2**. The catch showed that the result was not different significantly.

The garbage obtained from the two treatments were very different significantly, where the garbage caught by the net using TEDs was smaller than that without TEDs. The average of each catch was 0.1 kg and 1.31 kg per hauling respectively.

The smaller size of the fish and shrimp catch was influenced by the grids deflector on TEDs which retarded the fish (including garbage) entering into the codend net. But, by the reduction of the amount of fish and garbage entering the net will give positive influences to the

fishermen because the shrimp as the main catch of the “Arad” net will have good physical quality and will also make it easier in terms of its handling and sorting.

Body circle and weight per individual fish caught by using TEDs showed smaller size and weight compared to the ones caught without using TEDs. This was also caused by the retardation of big fish entering the codend of the net by TEDs grid deflectors.

## CONCLUSION

The use of TEDs on ‘Arad’ net (Otter Board Boat Seine) did not cause a difference in the amount of shrimp caught, but showed very significant difference to the amount of fish and garbage. The amount of fish and garbage with TEDs were smaller compared to the ones without TEDs.

The use of TEDs on “Arad” net (Otter Board Boat Seine) could improve

the physical quality of the catch and made handling and sorting of the fish and shrimp easier because of the reduction in the amount of garbage entering the codend net.

## REFERENCES

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- Asriyanto and Agung Setiarto; The Development of Selective and Unselective Fishing Gear Owned by Fisherman at the North Coast of Central Java. *J. Coastal Development*. 2000, 3, 551-558.
- Chokesanguan, B. : Research on TEDs in Southeast Asia. SEAFDEC, Thailand. 1999.
- Nasution, C.,D. Nugroho, and R.Jamal : Fishing Experiment on BED-trawl in Cilacap Water in October 1982. *Mar. Fish. Res. Rep.* 1983, 25,63-78.
- Nasution, C. : Preliminary Fishing Experiment on the Use of Turtle Excluder Device (TEDs) in Commercial Shrimp Trawling in the Arafura Sea. Paper in the FAO Workshop on Selective Shrimp Trawling with Selective Device, Darwin, Australia. 1997.
- Nasution, C. : Information Paper on Industrial Shrimp and Application of Selective Shrimp Fishing Gear, In Relation to Code of Conduct for Responsible Fisheries. Onboard Seminar RV. Umitaka Maru on Fishing Technology Training and Education. Jakarta. 1997.