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THE DEVELOPMENT OF SELECTIVE AND UNSELECTIVE FISHING GEAR OWNED BY FISHERMAN AT THE NORTH COAST OF CENTRAL JAVA

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ABSTRACT

Introduction : The Utilization of fisheries resources in Indonesia waters has just achieved about half (56.06%) of the maximum sustainable yield. In the north coast of Central Java, which has a coastal line of about 450 kilometers, 20 types of fishing gear are owned by fishermen

Experiment : Data were collected from Annual Report 1993 – 1997 issued by Central Java Fisheries Agency. Twenty types of fishing gear were classified into 6 groups, i.e. seine nets, purse seine, gillnets and trammel nets, lift nets, lines, and traps. Two of them were categorized as unselective fishing gear, i.e. seine nets and purse seine, whereas the other 4 were classified as selective ones. The number of each group was expressed in means and percentages and the development/changes thereof was presented in percentage.

Result and discussion : The number of unselective fishing gears grew rapidly from 1996 to 1997, i.e. seine nets 17.31% and purse seine 12.70%. On the contrary the number of selective fishing gear increased slightly or even decreased, for example traps (5.98%), line (4.13%), liftnets (-3.21%), and gill nets & trammel nets (-2.45%). The management of fisheries resources should be focused on the enhancement in the number of selective fishing gear and the extension of their fishing ground, combined with close monitoring on the mesh size of unselective fishing gear.

Keywords : North Coast of Central Java (Indonesia), Fishing Gear, Development 1993-1997.

I. BACKGROUND

The Java sea, including waters in the north of Central Java is full with fishing activities using various types of fishing gear. Along the North Coast of Central Java coastal waters, there are about 20 types of fishing gear which might affect fish population in this area. Mostly, These gears were mostly owned by fishermen living in this area, i.e. ship owners and labour fishermen.

The number of fishing gear differs from one area to another and fluctuate from year to year. Information about the number and types of fishing gear and their annual fluctuation is very useful as basic data to determine appropriate policy on the allowed number and types of fishing gear to be operated in the area concerned. In turn, this will improve the quality and production of fish without neglecting the sustainability of fish resources.

II. OBJECTIVE

This study was aimed at determining the number and fluctuation of various fishing gears in the north coast of Central Java from 1993 to 1997 which will be used as basic information for the management of fisheries resources in the future.

III. METHOD

Data were obtained from Annual Report of Central Java Fisheries Agency from 1993 to 1997, and further analyzed to get the general picture of the number and fluctuation of various fishing gears in the study area.

Twenty fishing gears were selected from a number of fishing gears owned by fishermen in 10 regencies and 3 municipalities along the north coast of Central Java, and these 20 were then classified into 6 groups. The 10 regencies were Brebes, Tegal, Pemalang, Pekalongan, Batang, Kendal, Demak, Jepara, Pati, and Rembang. The 3 municipalities were Tegal, Pekalongan, and Semarang. The 6 groups of fishing gear included seine nets, purse seine, gill nets & trammel nets, lift nets, lines and traps. The number and fluctuation of each fishing gear in the group were analyzed based on the average number of fishing gear and the percentage of their increase/decrease from 1993 to 1997.

IV. LITERATURE REVIEW

The north coast of Central Java has a coastal line of about 450 km long passing through 10 regencies and 3 municipalities (see Appendix 1). In these 13 areas various types of fishing gears are found among the local fishermen. From those fishing gears 20 could be considered to represent all the existing types, and then they could be classified into 6 groups. Those groups were selected on the basis that they might significantly affect the sustainability of fisheries resources in the study area.

The classification of those 20 fishing gears into 6 groups could be seen in Table 1 (Brandt, 1984; Directorate General of Fisheries, 1997).

Table 1. Classification of fishing gear in the north coast of Central Java

No	Group	Type of fishing gear		
		No	English name	Indonesian name
I	Seine nets	1.	Lampara	Payang
		2.	Boat seine	Cantrang/dogol
		3.	Beach seine	Pukat pantai
II	Purse seine	4.	Purse seine	Pukat cincin
III	Gill nets & trammel nets	5.	Drift gill net	Jaring insang hanyut
		6.	Encircling gill net	Jaring insang lingkar
		7.	Shrimp gill net	Jaring klitik
		8.	Set gill net	Jaring insang tetap
		9.	Trammel net	Jaring gondrong
IV	Lift net	10.	Raft lift net	Bagan rakit
		11.	Stationary lift net	Bagan tancap
		12.	Mechanized lift net	Anco
		13.	Hand lift net	Serok
V	Lines	14.	Tuna long line	Rawai tuna
		15.	Drift long line	Rawai hanyut
		16.	Set long line	Rawai tetap
		17.	Trolling	Pancing tonda
		18.	Pole line and vertical long line	Pancing dan rawai tegak
VI	Traps	19.	Pot	Bubu
		20.	Fyke net	Fyke net

All these fishing gears, except purse seine, are operated in the waters around the north coast of Central Java and Java sea.

Based on Infofish (1999) and Directorate General of Fisheries (1994) the utilization of fisheries resources in Indonesia waters has just achieved about half (56.06%) of the Maximum Sustainable Yield (MSY) which account for 6.6 million tons per year.

V. RESULT AND DISCUSSION

The tabulation of data on the number, average and percentage of fishing gear owned by local fishermen from 1993 to 1997 could be seen in Appendix 2. The average percentage of each type of fishing gear from 1993 to 1997 is shown in Fig. 1. and the average fluctuation/changes of fishing gear from 1993 to 1997 is presented in fig. 2.

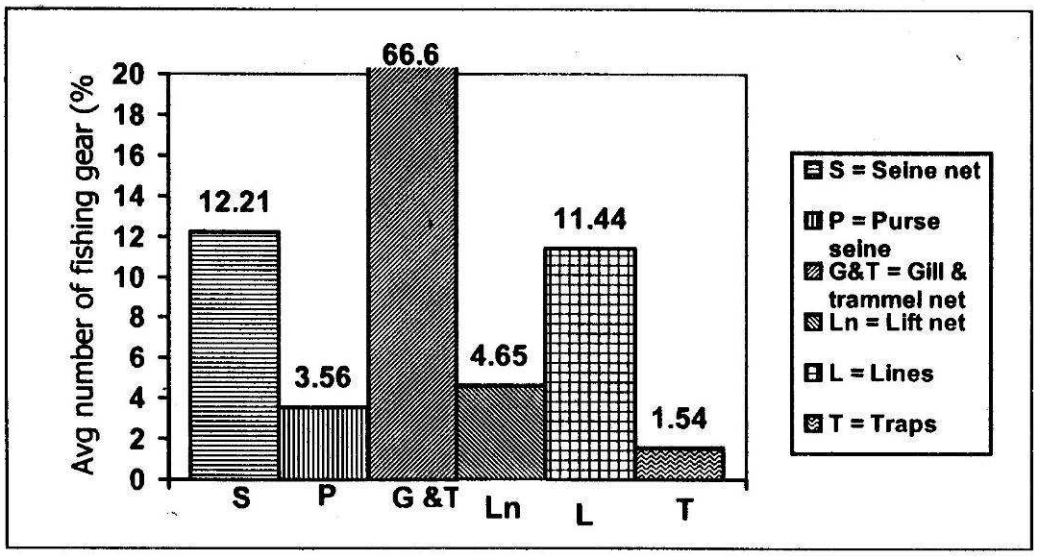

Fig. 1. Average number (in percentage) of fishing gears from 1993-1997

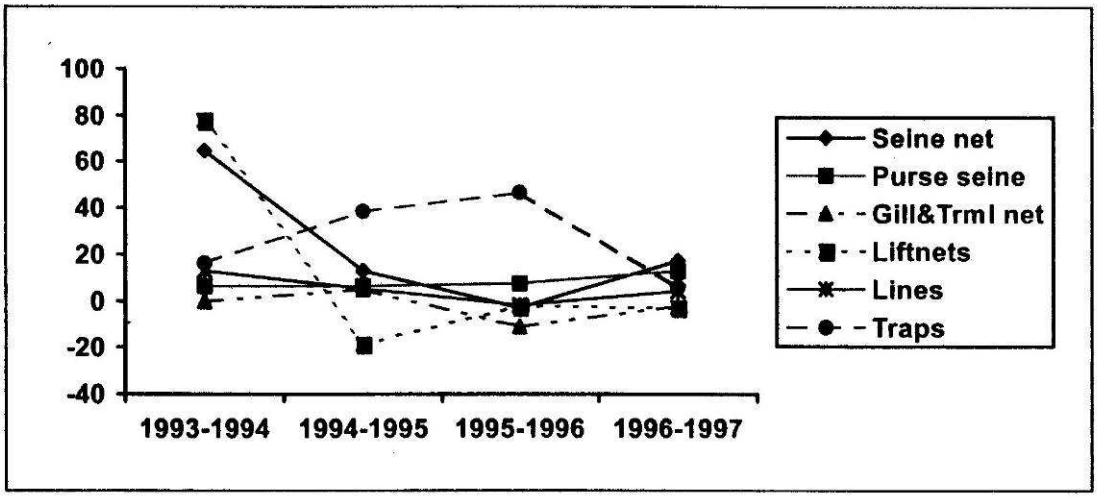

Fig. 2. Percentage of changes in the number of fishing gear from 1993 to 1997

From Fig. 1 it could be seen that the average percentage of the number of gill nets and trammel nets per year is the highest with 16413 units or 66.6%, and then followed by seine nets with 3008 units (12.21%), lines 2820 units (11.44%), and the remaining 3 groups are all under 5%.

The higher number of a particular fishing gear did not necessarily mean that the fishing gear reduced or threaten the sustainability of fisheries resources rather than other types with lower number. For instance, purse seine with only 877 units (3.56%) but is suspected of catching more fish than other gears. Other factors should also be taken into account such as mesh size, construction, operating method and fishing ground.

Fig. 2 indicates that purse seine and traps constantly increase in number from 1993 to 1997. The increased number of purse seine was significant in 1997 (12.70%), whereas for traps the number increased slightly (5.98%), which was the lowest compared to previous years.

Some fishing gears continually decreased from year to year including gill nets and trammel nets and liftnets. Whilst seine nets and lines fluctuated during the study period, i.e. from 1995 to 1996 the number decreased but in 1996 to 1997 they increased meaningfully, especially for seine nets (17,31%).

The above information on the decrease and increase of particular fishing gear in the study area is very useful for researchers and policy makers in Central Java in order to determine appropriate measures to prevent the fisheries resources from collapse due to indiscriminate fishing operations.

The increasing number of particular fishing gear that potentially endanger fish stock (unselective fishing gear), i.e. seine nets and purse seine, should be carefully examined. Fishing operation , construction (mesh size) and fishing ground of those gears should be strictly monitored and controlled by appropriate agencies.

With respect to the selective fishing gears such as gill nets and trammel nets, lift nets, lines and traps, which are relatively safe to fish population, their number could still be increased with some improvement on the construction and operation method.

VI. CONCLUSION

1. In the north coast of Central Java the average number of each fishing gear owned by local fishermen in the descending order are : gill nets & trammel nets (66.6%), seine nets (12.21%), lines (11.44%), lift nets (4.65%), purse seine (3.56%) and traps (1.54%).

2. Increase in the number of particular fishing gears, especially those unselective ones such as the purse seine and seine nets, should be carefully monitored in terms of construction (mesh size), operation method and fishing ground. Whereas for selective fishing gears such as gill nets and trammel nets, lift nets, lines and traps, their numbers need to be increased with particular improvement on the construction and operating method.

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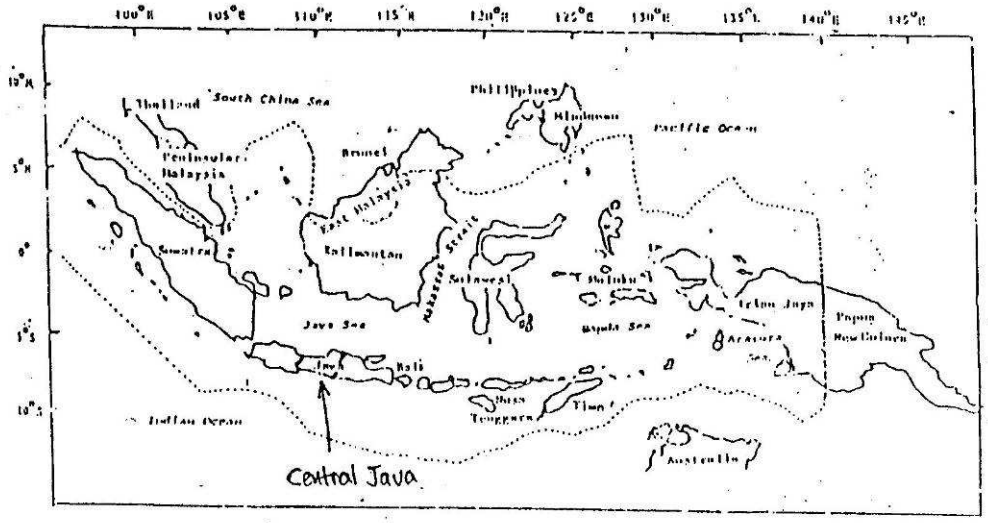
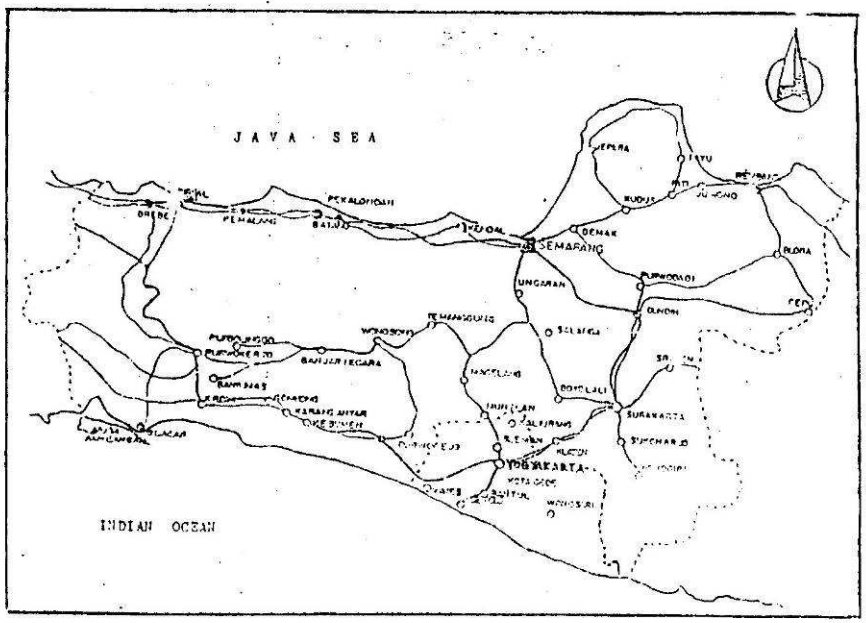
Appendix 1.



Map of Indonesia showing border line of Exclusive Economic Zone



Map of Central Java

Appendix 2. Number and changes of fishing gear in the north coast of Central Java from 1993 to 1997

Year	Number (units) and changes (%) of fishing gears												
	Seine nets	%	Purse seine	%	Gill & trammel nets	%	Lift nets	%	Lines	%	Traps	%	Total
1993	1,791		760		16,811		821		2,478		220		22,881
		64.32		6.32		-0.05		77.71		12.91		15.91	
1994	2,943		808		16,803		1,459		2,798		255		25,066
		12.61		6.19		4.78		-18.85		5.18		38.43	
1995	3,314		858		17,697		1,184		2,943		353		26,259
		-2.90		7.34		-		-2.53		-2.14		46.74	
1996	3,218		921		15,614	11.32	1,154		2,880		518		24,305
		17.31		12.70				-3.21		4.13		5.98	
1997	3,775		1,038		15,232	-2.45	1,117		2,999		549		24,710
Total	15,041		4,385		82,067		5,735		14,098		1,895		123,221
Average	3,008		877		16,413		1,147		2,820		379		24,644