The Role of Fishermen's Wives to Increase the Incomes of Traditional Fishermen Households (A Case Study at Pangandaran Sub District, Pangandaran District, Indonesia)

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Authors' contributions

This work was carried out in collaboration among all authors. Author SAW designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors AN and BSIB managed the analyses of the study. Author AAH managed the literature. searches. All authors read and approved the final manuscript.

Article Information

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ABSTRACT

This research aimed to analyze working time of fishermen's wives, the income of traditional fishermen households and the contribution fishermen's wives to increase the income of fishermen households. This research was conducted at Pangandaran and Pananjung Villages, Pangandaran Sub-District, Pangandaran District, Indonesia in October 2019 until March 2020. The method used in this research was a case study with the fishermen's wives as the analysis unit. Primary data were obtained from 35 respondents who were selected using purposive sampling method. The data were analyzed using quantitative and qualitative descriptive methods. The results showed that the type of works fishermen's wives are salted fish processor, "jambal roti" processor, seller fish and net puller. The average of working hours in economy activities (productive activities) is 6.9 hours or 28.6% per day, working hours in domestic activities is 3.8 hours or 15.7% per day and

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working hours in social activities is 2.5 hours or 10.4% per day. The average of total household income IDR 3,867,560,- or US$ 266.73. The contribution of fishermen's wives to household income is 36% and categorized as "low".

1. INTRODUCTION

Pangandaran has the large potential of fisheries sector. According to the data [1] the amount of captured fish production in Pangandaran Sub District in 2017 was 1,633.7606 tons with total production value was IDR 3,421,290,704,- or US$ 235,951.08. Most of the population in Pangandaran Sub District worked at fisheries sector, such as fishermen selling the fisheries product, etc.

Traditional fishermen in Pangandaran and Pananjung Villages are generally one-day fishermen with small pelagic and demersal fish, such as mackerel, flying fish, crab, shrimp, and small crab as their targeted species of fish caught. They generally used wooden outboard motorboats with sizes <5 Gross Tons (GT) as their fleet, and various tools such as togok, gill nets, fishing rods, and lampara basics as their fishing gears [2]. Most of fishermen in Pangandaran were still classified as traditional fishermen or labor fishermen. Labor fishermen are those who don't have their own fishing equipment. They work for fishermen skipper, which is the owner of the ship [3]. In terms of wage distribution, profit sharing system showed that 60% of total profit belongs to the fishermen who own the ship and another 40% belongs to the worker or labor fishermen [4]. They are known for their small and fluctuating income.

Fishermen are always associated with poverty, fishermen are traditional communities with apprehensive socio-economic conditions [5]. Poverty is a situation where a person or household has difficulty in meeting their basic needs, while the supporting environment does not provide opportunities to improve welfare on an ongoing basis or to escape vulnerability [6].

Fishermen's income is strongly influenced by several factors such as weather and season which caused the uncertainty of the amount of their income. The results of several studies showed that fishing business carried out by small-scale fishermen are highly dependent on the weather, season, limited assets and capital.

In the structure of coastal communities, the majority of heads of family work as fishermen. [7]. The level of income of the head of the family affects household welfare. It confirms that welfare in the household is very dependent on the head of the family figure without being influenced by other household members [8].

Poverty in households is affected by income and education, while the income is affected by labor and investment. This study showed that there is a strong relationship between the poverty conditions of households and the number of household members who have jobs as well as their level of education. The uncertainty of income earned by the head of the family as a fisherman encourages other household members like his wife and children to work as a means of meeting the needs of their household life [9].

On the other hand, in economical sense the traditional fishermen's wives has responsibility for the household economy. In simple terms, household economy can be influenced by two factors namely (a) sources of earnings and (b) management of the household economy or the control of household income and outcome. The source of earnings of traditional fisherman households mainly comes from the results of fishing activities at sea by the husband. The size of the fishermen's result depends on: (a) the amount of fish that can be caught and (b) the price of fish. Fish catches are influenced by many factors, including the number of caught fish and frequency of fishermen setting to sea, changing seasons and the types of technology used. Evenly, most of Pangandaran's fishermen are labor fishermen with their improvised equipment and low technology used [10].

Household income is usually the obligation of the husband as a breadwinner. Fishermen should be able to make ends meet of their family. However, the situation of fishermen who are still in a poor condition requires fishing family members to participate in making ends meet of their families. Woman's involvement in economic activities will increase the household income which can be used to meet daily necessities of the family

members. Generally, fishermen's wives have three roles which are performed simultaneously, namely productive, reproductive and social roles [11].

In Pangandaran Sub-District, many fishermen's wives are involved in economic activities (productive activities), such as salted fish processor, jambal roti processor (salted fish with bigger size and better quality), fish seller and the net puller, even though they are only involved as a net puller. Based on the background above, the aim of this research was to analyze working time of fishermen's wives, the income of traditional fishermen households and the contribution fishermen's wives to increase the income of fishing households.

2. METHODOLOGY

2.1 Time and Place of Research

This research was done during the period of Oct 2019-Jan 2020 in two villages whose livelihoods are in the fishing sector, namely Pangandaran Village and Pananjung Village,

Pangandaran District, Pangandaran Sub District, Indonesia.

Place of this research can be seen in Fig. 1.

2.2 Types and Sources of Data

This research used case study method. Primary data were collected using questionnaire based interview method. The interview includes respondent's age, education level, time spent working, and earning data of fishermen and their wives.

The data were collected using two techniques, namely 1) Questionnaire Technique (Questionnaire) 2) Interview. Interview were held with fishermen's wives and supported by direct observation toward various economic activities performed by fishermen's wives. Data were collected from primary sources, namely 35 fishermen's wives who became the respondents in this research. Respondents were selected through purposive sampling. The sample is as many as 35 fishermen wives out of 140 total multiple role wives in Pangandaran. The total respondents were taken at 25% of the total population.
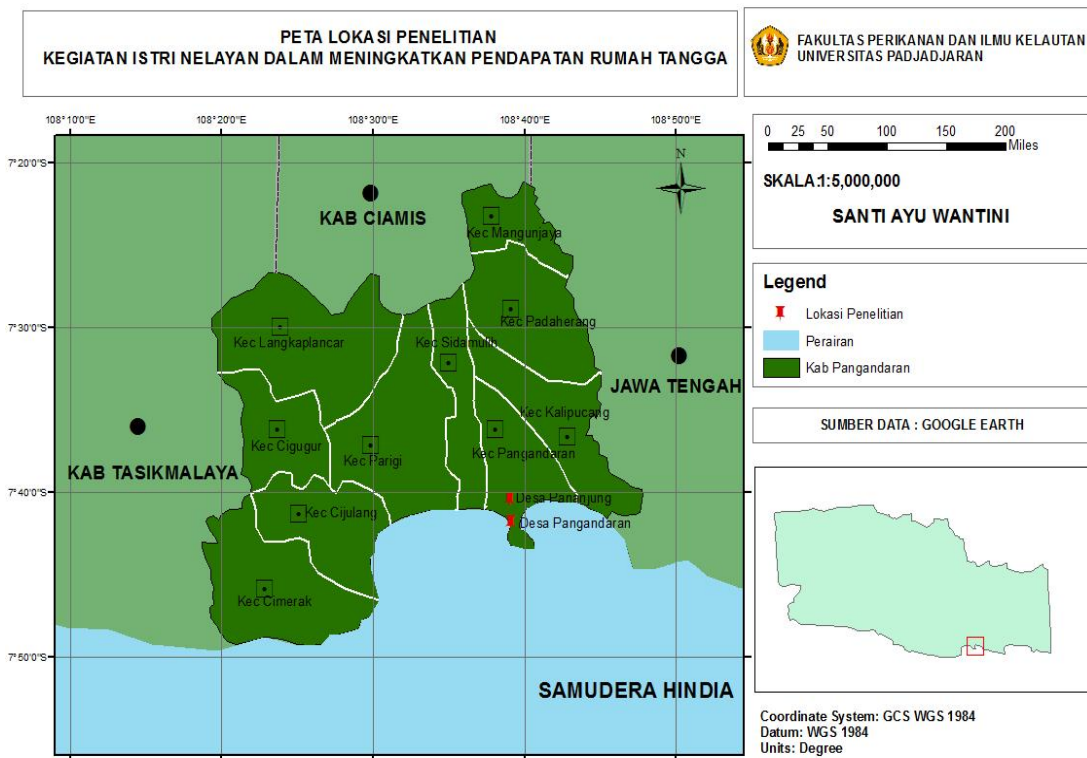

Fig. 1. Map of research place

Secondary data source using documentation technique. Documentation technique is the technique used to find additional data in the form of notes, transcripts, books, newspapers, magazines, inscriptions, meetings note, and agendas [12].

2.3 Data Analysis

This research used qualitative and quantitative analysis data.

2.3.1 Working time analysis

Working time of fishermen's wives can be analyzed using the following formula [13].

$$TWT = \frac{WTea}{(WTea + WTda + WTsa)x100\%}$$

Information:

WT = working time total fishermen's wives in economic activity (%)

$WTea$ = working time fishermen's wives in economic activity (%)

$WTda$ = working time fishermen's wives in domestic activity (%)

$WTsa$ = working time fishermen's wives in social activity (%)

2.3.2 Household income analysis

Household income analysis with the following formula [14].

$$It = Im + If + Io$$

Information:

It = Income total (Rp)

Im = Income man (Rp)

If = Income female (Rp)

Io = Income others (Rp)

2.3.3 Contribution income analysis

Contribution Analysis with the following formula [15].

$$C = \frac{I}{Hi} x100\%$$

Information:

C = Contribution (Rp)

I = Income of housewives (Rp)

HI = Total Households Income (Rp)

Further, the contribution of the income of fishermen's wives was classified based on the criteria as follows at the Table 1 [16].

Table 1. Category for contribution of income fishermen's wives

No	Category	Percentage (%)
1	Very low	1-19
2	Low	20-39
3	Fair	40-59
4	High	60-79
5	Very High	≥80

3. RESULTS AND DISCUSSION

3.1 Characteristics of Respondents

Characteristics of the respondents observed in this research consist of the types of economic activities, age and level of formal education that are shown in Table 2.

Based on Table 2, the works done by the fishermen's wives in Pangandaran and Pananjung Villages are generally in the informal fisheries sector. Usually, they undertake domestic activities at their home. However, they also carry out productive economic activities to increase family income. This is due to the huge number of businesses in the field of fisheries, especially processing, that can absorb labor, especially women. Salted fish processors, jambal roti processor, nets pullers, and fish seller are several works carried out by them. Those activities generally do not have binding working hours.

Majority 60% of the fishermen's wives (21 people) choose to work as salted fish processors which made this type of work the majority work of their community. The processed products are dried salted fish products with household production scale or small scale. This salted fish processing business depends on the availability of raw materials, namely the catch of fishermen. The raw material used is cheap or low economic value fish. The fish that are unsold at the Fish Auction Houses will be brought home by fishermen to be further processed by their wives into salted fish. They usually do this work themselves without hiring employees. Whereas the processing of jambal roti requires kadukang fish and salt as its raw material. The salt used is krosok salt purchased from Indramayu. In contrast to salted fish processing, the income

derived from jambal roti processing is much greater. The produced Jambal roti is usually not directly labeled because they will be sold to stalls, not directly to consumers.

The productive activities of fishermen wives as net pullers are usually carried out every day during the fishing season. This activity generates an uncertain income. They pull the nets for 3 times a day with several other workers. Usually, there are more than 10 workers for one fishing gear. In these two villages, they operate arad net fishing gear with fishing grounds located on the East Coast of Pangandaran.

The fishermen's wives who work as fish seller obtain fish from the nearest Fish Auction Houses. After going through the auction process, they get fish and then pack it in white plastic (specifically small fish). While other catches such as squid, shrimp, crabs are stored in a bucket or basin filled with water to maintain freshness. In their activities, fish collectors need transportation to market the fish. The location chosen for marketing fish is also different to obtain greater income.

Table 2 shows that the majority of respondents (89%) are in range age of 15-55 years, whereas respondents with the age more than 55 account for 11% (4 persons). This indicated that most fishermen's wives are in their productive age (15-55 years). Usually, respondents who are in their productive age and have good physical conditions can be more productive than the respondents who are over their productive age. This also make different income of both.

Majority 23 respondents (65.7%) received their education up to elementary school. Seen from the types of work done by fishermen's wives in Pangandaran and Pananjung villages, it can be concluded that their works do not require a high level of education. This is in line with the study of [17] which states that in general, those involved in the informal sector have low levels of education. In this case, the fishermen's wives in Pangandaran and Pananjung villages also experienced the same thing.

Further, the majority of respondents (23 person) have been doing economic activities at range 1-10 years (65.7%), and the remaining (22.9%) have been 11-20 years and 4 respondents have been more than 20 years (11.4%). This indicates that on average fishermen's wives have sufficient experience in conducting their current livelihood strategies.

3.2 Working Time of Fishermen's Wives

The flow of working time includes the economic activities or productive activities. Productive activity is an activity performed by fishermen's wives with the aim to increasing the income [18]. Therefore, as a part of their family, the fishermen's wives have a contribution that can't be ignored. By producing salted fish, jambal roti, selling fishes and becoming net drawer in the fishing process, the fishermen's wives have income that can be used to increase their

Table 2. Socio-demographic data fishermen's wives

Characteristics	Number	Percentage (%)
Economic activities		
Salted fish processors	21	60
Jambal roti processors	1	2.9
Fish Seller	7	20
Net puller	6	17.1
Age (years)		
<15	0	0
15-55	31	89
>55	4	11
Education		
Elementary School	23	65.7
Junior High School	10	28.6
Senior High School	2	5.7
Working Experience (years)		
1-10	23	65.7
11-20	8	22.9
<20	4	11.4

Table 3. Working time of respondents economic activities

No	Type of work	Working time	
		Accumulated time (Hours)	Percentage (%)
1	Producing salted fish	7.2	30.2
2	Producing jambal roti	8	33.4
3	Fish seller	5.2	21.7
4	Net puller	7	29.2
	Average	6.9	28.6

Table 4. Working time of respondents domestic activities

No	Type of work	Working time	
		Accumulated time (Hours)	Percentage (%)
1	Producing salted fish	3.8	15.7
2	Producing jambal roti	3	12.5
3	Fish seller	5.2	16.1
4	Net puller	3.9	18.8
	Average	3.8	15.7

Table 5. Working time of respondents social activities

No	Type of her work	Working time	
		Accumulated time (Hours)	Percentage (%)
1	Producing salted fish	2	8.5
2	Producing jambal roti	3	12.5
3	Fish seller	2.8	11.8
4	Net puller	2.1	8.9
	Average	2.5	10.4

households income. The working time of respondents' economic activities, domestic activities and social activities can be seen in Tables 3, 4 and 5.

Based on Table 3, this research showed that the average of fishermen's wives' working hours for productive economic activities reached 6.9 hours per day or 48.3 hours per week which the highest working time is obtained by respondents as a produce jambal roti, which reaches 8 hours (33.4%) per day. Based on the data, it is known that the fishermen's wives can be classified as full-time worker, according to the category determined by the East Java of Statistics which stated that workers who work more than 35 hours/week are classified as full-time workers.

Productive activities carried out by fishermen's wives require different time between one and the other. The time difference is based on the amount of work that must be done on each business.

During the interview, they said that the fishermen's wives' working hours also differ each month. Factors that affect the length of working hours are more related to the number of fish to be processed, labor that helps, and the weather or the sun. The more fishes are processed, the longer the working hours are. Particularly for the processing of salted fish and jambal roti, working hours in summer will be faster than working hours during the rainy season. Likewise, for fish collectors and net attractors, the more abundant the fish resources, the more catches they produce. This affects increasing the amount of work of net pullers. As for fish seller, because of the abundant catches, the types of fish sold by them are increasing in number, thereby increasing work hours.

Domestic activities are all activities carried out by fishermen's wives about household and family activities. Domestic activities include cooking, washing, cleaning the house, helping her husband before going to work, and raising children.

Based on Table 4, the average time spent by the fishermen's wives in domestic activities is 3,8 hours or 15.7% per day. It's lower than time spent for economic activities. The role of the fishermen's wives in domestic activities such as washing clothes by the category of 3 times washing per week is dominated by 27 people or

77.1% (18 people are salted fish processor, 1 people is jambal roti processor, 5 people are net puller and 3 people are fish seller) followed by 2 times washing per week as many as 8 people or 22.9% (3 people are salted fish processor, 1 people is net puller and 4 people as fish seller).

There are 30 people or 85.7% (which 20 people are salted fish processor, 4 people are net puller, 6 person are fish seller) who have a role in terms of cleaning and tidying the house 2 times a day, while the remaining 5 people or 14.3% (1 people is salted fish processor, 1 people is jambal roti processor, 2 people are net puller and 1 people is fish seller) cleaning the house and tidying the house 3 times a day, usually done in the morning day, afternoon and evening. The act of cleaning the house in terms of mopping, the fishermen's wives does it 2 times a day, as many as 35 people or 100% do the mopping the house 2 times a day.

In terms of taking care of children, to prepare school uniforms, 14 people or 40% answered yes (10 person are salted fish processor, 3 people as fish seller, 1 people is net puller), 6 people or 17.1% (2 people are salted fish processor, 1 people is jambal roti processor, 3 people are fish seller) answered sometimes and 15 people or 45.9% (9 people are salted fish processor, 5 people are net puller, and 1 people is fish seller) answered no.

In terms of whether the wives ever helped their husband preparing to work, as many as 31 people or 88.6% (21 people are salted fish processor, 1 people are jambal roti processor, 6 people are fish seller and 3 people are net puller) gave answers yes and as many as 4 people or 11.4% (1 people is seller fish and 3 person are net puller) gave answers sometimes.

Table 5 shows that the average time spent by the fishermen's wives in social activities is 2.5 hours or 10.4%. Fishermen's wives doing social activities such as social gathering groups (namely *arisan*) in Pangandaran Sub-District, with the number of time participating in social gathering in one month following social gathering as many as 25 people or 71.4% (19 people are salted fish processor, 2 people are fish seller and 4 people are net puller) participated one time, as many as 3 people or 8.6% (2 people are fish seller and 1 people is net puller) participated 2 times, and as many as 7 people or 20% (2 people are salted fish processor, 1 people is jambal roti processor, 1 people is net puller and 3

people are fish seller) participated in 3 social gathering in one month.

The results of the research above are also relevant to the findings on research [19] which states that the role of housewives who work outside as breadwinners turns out they have never abandoned their duties and responsibilities as a wives and as a mother in her family.

3.3 Total Household Income

Household income is the total income of all members of a household, which can be obtained from the income of husband, wives, and other household members. On this research, the household income obtained from husband and his wives who performs such economic activities. The average household income is shown in Table 6.

The average monthly income of fishermen is not the same. This is following the statements of several researchers who revealed that fishermen's household income has uncertainty [18]. In this study, income is taken from the last month before the interview process is conducted.

Based on Table 6, it can be seen that the biggest contribution of household income comes from the husband, amounting to IDR 2,479,167 or US$ 170.98. The income contribution from the fishermen's wife is IDR 1,388,393 or US$ 95.75. Overall, it is known that the total household income of fishermen in Pangandaran and Pananjung Villages reached IDR 3,867,560 or US$ 266.73, which means greater than the Regional Minimum Wage value of Pangandaran Regency in 2020, amounting to IDR 1,860,591.33 or US$ 128.32 per month.

3.4 The Contribution of Fishermen's Wives to Household Income

High income of fishermen's wives makes a big contribution to increase the household income. To find out the role of fishermen's wives to increase the household income, the income and expense can be used as indicators of economic activities [20]. The contribution of fishermen's wives to household income is shown in Table 7.

Table 5 shows that contribution of fishermen's wives income to the household income ranging from 23.5% to 50%. The average of fishermen's wives income is lower than her husband. The

Table 6. Average the traditional fishermen household income per month

No	Economic Activities	Income (Rp)		Household Income (Rp)	RMW of Pangandaran District
		Husband	Wives		
1	Producing salted fish	2,738,095,-	840,476,00,-	3,578,571	1,860,591,-
2	Producing jambal roti	2,000,000,-	2,000,000,-	4,000,000,-	
3	Selling fishes	2,928,571,-	1,571,429,-	4,500,000,-	
4	Net towing	2,250,000,-	1,141,667,-	3,391,667,-	
	Average	2,479,167,-	1,388,393,-	3,867,560,-	

Table 7. Contribution of fishermen's wives to household income

No	Economic Activities	Revenue contribution (%)		Category
		Husband	Wives	
1	Producing salted fish	76.5	23.5	Low
2	Producing jambal roti	50	50	Fair
3	Selling fishes	65.1	34.9	Low
4	Net towing	66.3	33.7	Low
	Average	64	36	Low

highest contribution is found at wives who producing jambal roti (50%). This is because high demand for quantities of jambal roti and jambal roti has a high price that's make fishermen's wives as produced jambal roti generated the highest income.

The lowest income is found at wives who producing salted fish, because the price of salted fish is cheapest. Salted fish made from the pelagic fish which has a small size and has a low value of economic. Overall, contribution of fishermen's wives income to the households income is categorized as "low" (36%). But, the wive's income is helpful and can supports the daily basic needs. Although the contribution is not too large, the fishermen's wives' economic activities are felt to play an important role in increasing family income.

4. CONCLUSION

Based on the research regarding the role of the fishermen's wives to increase the traditional households income of traditional fishermen households at Pangandaran Sub-District, it can be concluded that the type of works fishermen's wives are salted fish processor, "jambal roti" processor, seller fish and net puller. The average of working hours in economy activities (productive activities) is 6.9 hours or 28.6% per day, working hours in domestic acitvities is 3.8 hours or 15.7% per day and working hours in social activities is 2.5 hours or 10.4% per day. The average of total household income IDR 3,867,560 or US$ 266.73. The contribution of

fishermen's wives to household income is 36% and categorized as "low".

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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