Analysis the factors affecting the women's participation in economic activities of the fisherman households in coastal areas

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Abstract. The role of women is one of the human resources that need to be economically empowered, in meeting daily needs. The purpose of this research to determine the shape of women's participation and to analyse factors affecting women's participation in economic activities of the fisherman's households, especially in Medan Labuhan, Medan Marelan and Medan Belawan sub-districts. The determination of the area is done purposively. The sample's large method of determination is determined by the formula Slovin, and the samples are randomly drawn (simple random sampling) and the technique of sample quantities from each research site or each sub-district is a proportional sampling. The methods of data analysis used are methods of descriptive analysis and regression logistic. The results showed that 40 people (41.24%) fisherman's wife does work and 57 people (58.76%) The fisherman's wife works from a total of 97 respondents and the estimated results show the factors that significantly affect women's participation in the fisherman's household economic activity are the number of family dependents and husband's permission.

1. Introduction

Medan City is one of the cities in North Sumatra has the coastal and sea areas, Medan City is included on the east Coast region of North Sumatra that is potentially in the development of fishing and fish processing [1]. From the 21 sub-districts of Medan, it includes three sub-districts are Medan Belawan, Medan Labuhan, and Medan Marelan which is the centre of fish production and work as fishermen.

Fishermen as a person who is in a livelihood in fishing operations and other water animals depends on several factors such as social factors, economics, technology and natural factors, so that it greatly affects the income of fishermen Erratic and influential to the welfare of households, this is the problem faced by fishermen because the economic level of the declining fishermen causes poverty among fishermen and coastal communities. Women can make important contribution in development through gender equality. The World Bank in the book Engendering Development states the gender equality is a key development issue strengthen the country's ability to develop, reduce poverty, and run quality governance [2].

The fishermen household life is very concerned and driven by uncertain economic condition of the family, not infrequently make the fishermen women should be involved actively in productive activities, which is earning a living in anticipation if their husbands Not earning income. Therefore, this research was conducted to determine the shape of women's participation and suspected factors
affecting women's participation in economic activities of fishermen's households, especially in the sub-districts of Medan Labuhan, Medan Marelan and Medan Belawan because the three sub-districts are coastal areas in Medan City.

2. Data and method

This research was conducted in the coastal area of Medan which includes 3 sub-districts, Medan Labuhan, Medan Marelan sub-district, and Medan Belawan Sub-district. Sample is determined by Slovin method [3] and randomly drawn (simple random sampling), where the number of fishermen household population 2,906 RT [4], with a tolerance limit 10% and the number of samples taken by 97 respondents. Determination number of samples from each sub-district is proportional sampling [5], that is Medan Labuhan 10 respondents, Medan Marelan 6 respondents and Medan Belawan 81 respondents.

In this research used methods of logistic regression analysis (Logit) a method can be used to search the relationship between a dichotomous response variable (nominal scale/ordinal with two categories) with one or more variables Predictive or continuous category-scaled predictors [6]. The model used in this research is the transformation of the Logit form \( \pi(x) \) as follows:

\[
g(x) = \ln \left[ \frac{\pi(x)}{1 - \pi(x)} \right] = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \beta_7 x_7 + \beta_8 x_8 + \beta_9 x_9\tag{1}
\]

Description:

\( \pi(x) \) = participation of Fisherman’s Wife (\( \pi(x) = 1 \) If the Fisherman’s wife works and \( \pi(x) = 0 \) If the fisherman’s wife does not work)

\( 1 - \pi(x) \) = participation of unemployed Fisherman's wife

\( \frac{\pi(x)}{1 - \pi(x)} \) = Odds ratio (risk)

\( x_1 \) = Respondent's age (years)

\( x_2 \) = husband Age (years)

\( x_3 \) = Education of Fisher's Wife (years)

\( x_4 \) = Husband’s education (years)

\( x_5 \) = family Number (soul)

\( x_6 \) = Husband's income (Rupiah per month)

\( x_7 \) = Husband’s permission (1 = If the Fisherman's wife was given the husband’s permission to work, 0 = If the fisherman's wife was not given the husband’s permission to work)

\( x_8 \) = Home condition (1 = Permanent, 2 = Semi permanent, 3 = not permanent)

\( x_9 \) = Home ownership (1 = own, 2 = contract, 3 = inheritance)

\( \beta_0 \) = INTERSEP or constant

\( \beta_1 - \beta_9 \) = parameter coefficient

Testing the logistic regression model parameters using a simultaneous test that is a test conducted with the Likelihood Ratio Test or G test statistics and partial test conducted with a Wald test statistic, to test the suitability of the logistic regression model used Goodness of Fit and Interpretation of categorical parameter coefficients using odds ratio (\( \psi \)). Meanwhile, for continuous predictor variables or covariates, interpreted based on the value of the Marginal Effect which states the influence of each predictor variable impact on the probability of response variable.
3. Result and discussion

3.1. Distribution of shape respondent participation
Analysis results participation shape of the fishermen wife in economic activities of the fishermen household shows 40 people (41.24%) Wife fisherman does not work or as a housewife and 57 people (58.76%) The fisherman's wife worked from a total of 97 respondents. Most work done by Fisherman's wife who works as a marine catchment processor, trade food or groceries even there are some fishermen wives working as housekeepers.

3.2. Analysis estimation results of the logistics regression parameters
The result of parameter estimates factors affecting women's participation in economic activities of fishermen households can be seen in Table 1 as follows:

| Variable                              | B    | S.E.  | Wald | Df | P value |
|---------------------------------------|------|-------|------|----|---------|
| Age of respondents                    | .110 | .276  | .158 | 1  | .691    |
| husband's age                         | -.031| .244  | .016 | 1  | .900    |
| Respondent Education                  | -.501| .480  | 1.090| 1  | .296    |
| Husband's education                   | .513 | .448  | 1.315| 1  | .252    |
| The total of dependents               | 2.747| .954  | 8.295| 1  | .004    |
| Husband's income                      | .000 | .000  | .017 | 1  | .897    |
| Step 1a                               |      |       |      |    |         |
| Husband's permission (1)*             | 6.570| 2.319 | 8.024| 1  | .005    |
| Home conditions                       | 3.337| 2     |      | 2  | .189    |
| Home conditions (1)                   | -3.150| 1.817| 3.006| 1  | .083    |
| Home conditions (2)                   | -1.937| 2.515| .593 | 1  | .441    |
| Home ownership                        | .149 | 2     |      | 2  | .928    |
| Home ownership (1)                    | .095 | 2.301| .002 | 1  | .967    |
| Home ownership (2)                    | 2.106| 5.595| .142 | 1  | .707    |
| Constant                              | -17.765| 8.481| 4.388| 1  | .036    |
| Step 8a                               |      |       |      |    |         |
| The total of dependents               | 2.001| .520  | 14.811| 1 | .000    |
| Husband's permission (1)              | 4.975| 1.466| 11.524| 1 | .001    |
| Constant                              | -11.143| 2.820| 15.615| 1 | .000    |

G = 103.607 (sig = .000)
Chi-square = 2.353 (sig = .938)
Nagelkerke R-Square = .884

Significance at α 5%

3.2.1. Simultaneous test. Table 1 shows the test Result of the Parameter Significance Simultaneously with G test was obtained the test results of (103.067) with degrees of freedom = 2, P value of (0.000), while the value of X²<sub>table</sub> (5.99148) test results of Likelihood Ratio Test obtained the decision to reject H₀ because G > X²<sub>0.05; 2</sub> and the value of P value (0.000) < α (0.05) so the coefficient concluded β simultaneously or at least one variable predictor or independent which is influential To the fisherman women participation.

3.2.2. Partial test. Based on Table 1, the results of test significance parameters partially or individually, indicating the results of the hypothesis testing described as follows:
1. The total of dependents variable (X5) obtained the value of Wald (14.811) with a degree of freedom = 1, and the value of P value of (0.000) with a significance level (0.05) so the value X² (0.05; 1) amounted to (3.841) obtained the decision to reject H₀ because The value of Wald (14.811) > The value X² (0.05; 1) (3.841) concluded the number of dependent variables was influential on the participation of fishermen women in the household economic activities of fishermen.
2. Husband's permission variable (X7) obtained the value of Wald (11.524) with degrees of freedom = 1, and the P_value (0.001) with a significance amount of (0.05) so the value of $X^2$ (0.05; 1) amounted to (3.841) and obtained the decision to reject H0 because the value of Wald (11.542) > the value of $X^2$ (0.05; 1 (3.841) concluded that the husband's clearance variable affects the participation of fishermen women in the household economic activities of fishermen.

The logit model that formed is as follows:

$$
\pi(x) = \frac{e^{-11.143 + 2.001X5 + 4.975X_7}}{1 + e^{-11.143 + 2.001X5 + 4.975X_7}}
$$

(2)

The model is non-linear in the parameters so as to make the model linear is carried out by the natural logarithm so it becomes the following:

$$
g(x) = \ln \left( \frac{\pi(x)}{1 - \pi(x)} \right) = -11.143 + 2.001X_5 + 4.975X_7
$$

(3)

1 - $\pi (x)$ is a chance of participation of the fisherman's wife does not work, and the opposite of $\pi (x)$ is a chance of participation of a fisherman's wife working where the coefficient in this equation shows the influence number of family dependents and husband's to the chances participation of a working fisherman wife compared to the participation of the unemployed fisherman's wife.

3.2.3. Model suitability test. Table 1 shows the Chi-Square value amounted to (2.353) with a free degree = 7 obtained a value with an alpha 0.05 (14.067) and the magnitude of the P_value (0.938) so the decision received H0 because $C_{hitung}$ (2.353) < $X^2_{0.05;7}$ (14.067) and $P_{value}$ (0.938) > $\alpha$ (0.05) which means the model has the corresponding no significant difference between observations with the possibility of predictive results of the model. The goodness of the models gained in the analysis is used to determine the extent to which the predictor variables can explain the model formed with the R-Square value indicating that the value of Nagelkerke R-Square amounted to (0.884) or 88.4%, thereby Can be interpreted that with two variables namely the number of husband (X5) and the consent of the husband (X7) then the proportion of the participation of fishermen's wife work can be explained by 88.4% and the remaining 11.6% are explained by other factors.

3.3. Interpretation result coefficient parameters

The probability of participation fisherman's wife suggests that of 2 significant variables affecting the participation of the Fisherman's wife consisted of categorical variables and covariates.

1. The total of family dependents variable (X5) is a variable of covariate indicating a significant positive influence on the working fisherman's wife, the Marginal Effect (ME) value of 0.21 or 21% indicating that every increase of 1 People's total family dependent will increase the probability of participating fishermen's wives to work.

2. The husband's permission variable (X7) is a categorical variable that significantly affects the participation of the fisherman's wife, the odds ratio 144.750 can be interpreted that the chances of participation of a fisherman's wife by obtaining a husband's permission to work was 144.750 times compared not getting the husband's permission to work. While the P value of the husband's permit variable (X7) indicates that the wife of a fisherman who gets a husband's permission to work has a probability of 0.99 or 99% compared to a fisherman's wife who does not get permission to work.

The probability calculation of fisherman’s wife participation of the logit model formed, if a fisherman's wife is known to have a total family 4 people and is allowed to work by the husband, the chance of the fishermen wife's participation to work are as follows:

$$
P(Y = 1) = \frac{e^{-11.143 + 2.001(4) + 4.975(1)}}{1 + e^{-11.143 + 2.001(4) + 4.975(1)}} = \frac{2.724836}{1 + 2.724836} = \frac{6.279}{7.279} = 0.86
$$

(4)

4
While the chances of participation of fisherman's wife does not work are as follows:

\[ P (Y = 0) = \frac{1}{1 + e^{-11.143 + 2.001(4) + 4.975(1)}} = \frac{1}{1 + 2.721.836} = \frac{1}{7.279} = 0.14 \] (5)

Based on the analysis obtained at the time of the number of family dependents 4 persons and the husband gives permission to work the probability value for \( P (Y = 1) \) or the chance of the fisherman's wife participation is 0.86 or 86% from total fisherman's wife in research area, and vice versa when the number of family dependents below 4 people and the husband does not give permission to work has a probability value of 0.14 or 14% from total of fisherman's wife in research area. The influence number of family members on working woman is due to the magnitude of the burden borne by the family head, it further affects the participation of women working. The decision of the Fisher woman (Fisherman's wife) who participated in the work should have the support of the husband through granting of permission from the husband to do this because it is still the high religious value held by the female fishermen (fishermen wives) To obey Husbands, It is evident that almost all of the fisherman's wives should get the husband's permission to work either out from the house or not out from the house.

4. Conclusion
Based on the analysis has been done the following conclusions. The number participation of a fisherman's wife working in household economic activity is greater than the participation of the unemployed fisherman's wife of 57 people (58.76%) and 40 people (41.24%). Factors affecting women's participation in fishermen's household economic activities are the number of family dependents and husband's permission. From the estimated number of family dependents, it has a marginal effect value of 21% which means with an increase in total dependents of 1 person, the chance of a fisherman's wife to work increases by 21%, while the opportunity of husband's permission variable is 9% greater than the husband's permission to the fisherman's wife to work.

References
[1] Dinas Kelautan dan Perikanan [Department of Maritime and Fisheries] 2018 Potensi Kelautan dan Perikanan Sumatera Utara [Marine potential and fisheries of North Sumatera] (Medan: Department of Maritime and Fisheries)
[2] Sofiani T 2009 Membuka Ruang Partisipasi Perempuan dalam Pembangunan [Opening the women's participation space in development] Muwazah 1 1 63-71
[3] Sevilla C 1993 Pengantar Metode Penelitian [Introduction to research methods] (Jakarta: Universitas Indonesia Press)
[4] Badan Pusat Statistik Sumatera Utara [BPS-Statistics of North Sumatera] 2017 Sosial dan Kependudukan Tenaga Kerja [Social and employment] (Medan: BPS North Sumatera)
[5] Luck D J and Rubin R S 1987 Marketing Research Seventh Edition (New Jersey: Prentice-Hall Inc.)
[6] Hosmer D W and Lemeshow S 2000 Applied Logistic Regression 2nd Edition (New York: Jhon Wiley and Sons)