

Identification of Women's Participation in the Household Economy in the Agricultural Sector

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ABSTRACT

The role of agricultural development is increasingly visible from the ability of the agricultural sector to contribute to Indonesia's income, including in the absorption of labor. The development of human resource aspects in the agricultural sector is key in the long-term development of the agricultural sector. Increasing the capacity of women as an important part of human resources in the agricultural sector has not yet been implemented optimally. Various efforts made to improve access to information as a means of acquiring knowledge for farmers still do not involve many women in it. The role of women in the agricultural sector is undeniable. The push for gender equality itself provides space for women to be more involved in the economy, both in terms of quantity and quality. This research aimed to determine the characteristics of women farmers and to identify women's participation in household economic activities in the agricultural sector, especially Kemuning Lor Village, Jember Regency. Based on the results, it was known that the participation rate of women in playing a role in supporting the family economy was 64%. As many as 25% of the female population who worked in agriculture were landowners/farmers. Then as many as 6% of the female population worked as odd farm laborers, 12% as coffee farmers, 18% as sugarcane workers, 14% as workers in the non-formal sector such as tailors, selling food, stalls. The partial test showed that the most influential variable for working women was income with Exp(B) of 629,876 meaning that the higher the wife's income, the higher the tendency of women to work.

Keywords: Participation, Woman, Economy, Agriculture

1. INTRODUCTION

The agricultural sector is a sector that has a significant role in the Indonesian economy. The agricultural sector is a very strategic factor, is the economic basis of the people in rural areas, controls the lives of most of the population, absorbs more than half of the total workforce, and even becomes a safety valve in the Indonesian economic crisis [1]. Integrated agricultural sector management can be used as a strategy to build the potential of the agricultural sector that faces decline [2].

In harmony with agricultural development which aims to increase farmers' income and standard of living, increase employment and business opportunities, improve household nutrition and food security, and eradicate poverty in rural areas. All of these are closely related to the roles, duties, and functions of women in rural areas. Women have job opportunities that can

generate income for their households, to reduce poverty in rural areas [3].

Increasing the capacity of women as an important part of human resources in the agricultural sector has not yet been implemented optimally. Efforts made to improve access to information as a means of acquiring knowledge for farmers still do not involve many women in it [4]. The push for gender equality itself provides space for women to be more involved in the economy, both in terms of quantity and quality [5]. The discourse on women's empowerment is one of the centers of attention in the development of human resources in Indonesia, this is because until now women are still lagging behind men's quality, this is viewed from various indicators, one of which is the low female literacy rate, participation rate low female labor force and high maternal mortality rate [6]

The role of women farmers can be supported by an outpouring of time or energy approach which in return will have economic value (generating income) as well as social value (taking care of the household and solidarity in earning a living in generating household income) [7]. This study aimed to identify women's participation in household economic activities in the agricultural sector, especially in Kemuning Lor Village, Jember Regency. This was done based on data from the livelihoods of the people of Kemuning Lor, 68.8% are farmers and farm laborers [8].

2. METHOD

The method of analysis in this study used descriptive analysis and logistic regression analysis.

2.1. Data Source

The data source used in this study were primary data obtained through surveys and interviews with women who worked in the agricultural sector in Kemuning Lor Village, Arjasa District, Jember Regency in August – September 2021. The number of samples used was 58 respondents.

2.2. Operational Definition and Research Variables

The operational definition of research variables is as follows.

- Y: woman/housewife (0: not working; 1: working) [9].
- X1: wife's age (years)
- X2: Age at first marriage (years)
- X3: Family members
- X4: Number of school children
- X5: Age at first childbirth
- X6: Childbirth assistance (0: non-medical; 1: Medical)
- X7: Wife's income (million)
- X8: Total revenue (million)
- X9: Total expenditure (million)
- X10: Status of receiving Funds from the Government (BLT) (0: not receiving; 1: receiving)
- X11: Husband's age (years)

2.3. Construct Model

Binary logistic regression analysis is a logistic regression between the response variable (y) and the predictor variable (x) where the y variable produces 2 categories, namely 0 and 1 [10]. So that the variable y follows the Bernoulli distribution with the probability function as follows.

$$f(y)=\pi y(1-\pi)^{1-y}; y=0,1$$

If $y = 0$ so $f(y)=1-\pi$ and if $y = 1$ so $f(y)=\pi$. The logistic regression function can be written as follows.

$$f(z) = \frac{1}{1+e^{-z}} \text{ ekuivalen } f(z) = \frac{e^z}{1+e^z}$$

$$\text{where } z = \beta_0 + \beta_1 x_1 + \dots + \beta_p x_p$$

If the value of z between $-\infty$ and ∞ so the value $f(z)$ between 0 and 1 for each value of z. This shows that the logistic model describes the probability or risk of an object. The logistic regression model is as follows.

$$\pi(x) = \frac{e^{\beta_0 + \beta_1 x_1 + \dots + \beta_p x_p}}{1 + e^{\beta_0 + \beta_1 x_1 + \dots + \beta_p x_p}}$$

Where p = number of predictor variables

If the above equation model is transformed by the logit transformation, then the logit form is obtained as in the following equation.

$$g(x) = \ln \left(\frac{\pi(x)}{1-\pi(x)} \right) = \beta_0 + \beta_1 x_1 + \dots + \beta_p x_p$$

3. RESULTS AND DISCUSSION

3.1 Characteristics of the Woman Kemuning Lor

Based on the results of the survey and analysis, information was obtained that most women in Kemuning Lor worked in the agricultural sector, either in their plantations or as farm laborers. Women residents who worked as farmers went to work in the morning and came home in the afternoon. The mostly done work was as coffee farm laborers, agricultural laborers for horticulture crops, sugar cane workers, and farmers on their land.

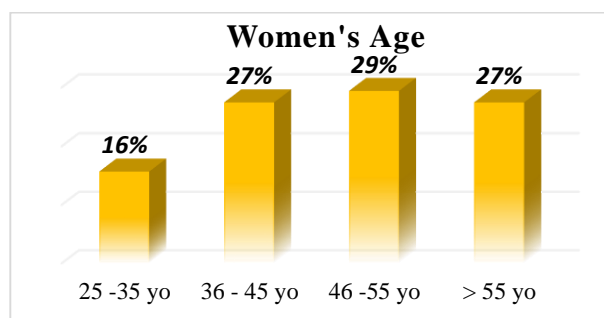


Figure 1 Women's age

Based on the survey results, it was known that the age of the female population in Kemuning Lor Village was dominant in the productive age (36-55 years old) and only 27% of the elderly population were still working.

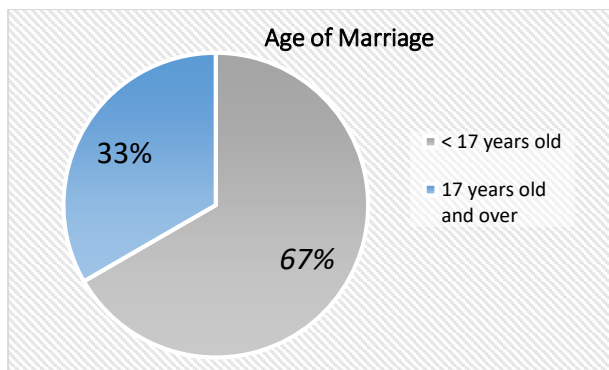


Figure 2 Age of Marriage

Based on Figure 2, it can be seen that the female population in Kemuning Lor Village married under 17 years old, whereas many as 67% of women married under 17 years old and 33% married above 17 years old.

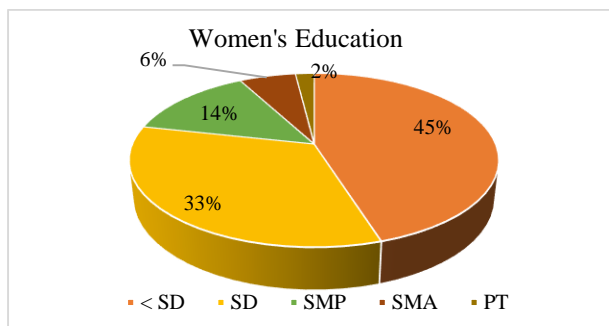


Figure 3 Women's Education

Based on Figure 3, it can be seen that women in Kemuning Lor Village were mostly elementary school graduates (78% of women living in Kemuning Lor Village). The low level of education of a mother affects various aspects of life, both health, child development, and the family economy

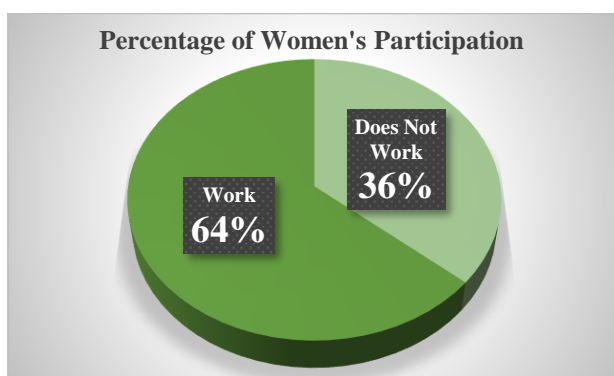


Figure 4 Percentage of Working Women

Based on Figure 4, it was known that the participation rate of women in playing a role in supporting the family economy was 64%. It was done apart from economic factors in Kemuning Lor Village itself that many jobs could be done by women. For example, coffee workers, harvest workers, plant workers, as well as tailors. The

details of the types of women's work in Kemuning Lor Village are explained in Figure 5.

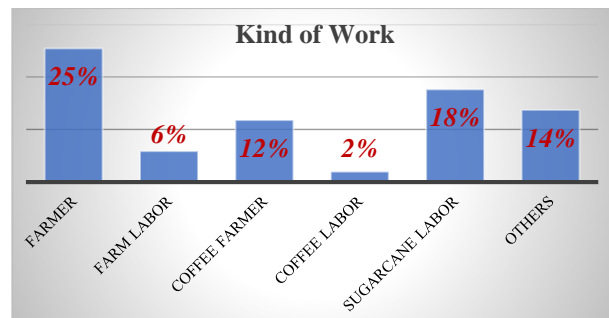


Figure 5 Kind of work

Based on the survey results, it was known that as many as 25% of the female population who worked in agriculture were landowners/farmers. Then as many as 6% of the female population worked as odd farm laborers, 12% as coffee farmers, 18% as sugarcane workers, 14% as workers in the non-formal sector such as tailors, selling food, stalls. Given agriculture as an occupational technology, the socio-economic and demographic characteristics of the women farmers can influence the level of their participation in agricultural production [11].

3.2 Binary Logistics Regression of Women Farmers Participation in Kemuning Lor

The data used in this study were 58 respondents, all of whom were wives of farmers in Kemuning Lor Village. Based on the results of the survey, it was found that 21 women were known to be unemployed and 37 women worked.

3.2.1 Estimation of Logistics Regression Parameters

Table 1. Estimation Parameters

| Variable | B | S.E. | Wald | Sig. | Exp(B) |
|---|---------------|--------------|--------------|---------------|---------------|
| Women's age | 0.240 | 0.186 | 1.671 | 0.196 | 1.271 |
| Age of marriage | -0.201 | 0.357 | 0.316 | 0.574 | 0.818 |
| Family members | -0.538 | 0.950 | 0.321 | 0.571 | 0.584 |
| Number of school children | -0.736 | 1.997 | 0.136 | 0.712 | 0.479 |
| Age at first childbirth | -0.193 | 0.504 | 0.147 | 0.702 | 0.825 |
| Childbirth assistant (1) | 1.409 | 3.288 | 0.184 | 0.668 | 4.092 |
| Wife's income | 13.353 | 5.829 | 5.248 | 0.022* | 629876 |
| Total income | -0.176 | 0.372 | 0.224 | 0.636 | 0.838 |
| Total expenditure | 1.647 | 1.774 | 0.861 | 0.353 | 5.190 |
| Status of receiving Funds from the Government (1) | 1.977 | 2.153 | 0.843 | 0.359 | 7.218 |
| Husbands' ages | -0.201 | 0.194 | 1.065 | 0.302 | 0.818 |
| Constant | -0.244 | 11.087 | 0.000 | 0.982 | 0.784 |

Based on the results of the analysis, the logistic regression equation obtained was as follows.

$$\begin{aligned} \hat{g}(X) = & -0,244 + 0,240 \text{ Women's age} - 0,201 \text{ Age of marriage} \\ & - 0,538 \text{ Family members} \\ & - 0,736 \text{ Number of school children} \\ & - 0,193 \text{ Age at first childbirth} \\ & + 1,409 \text{ Childbirth assistant (1)} \\ & + 13,353 \text{ Wife's income} \\ & - 0,176 \text{ Total income} \\ & + 1,647 \text{ Total expenditure} \\ & + 1,977 \text{ Status BLT(1)} \\ & - 0,201 \text{ Husband's age} \end{aligned}$$

Where:

Childbirth Assistance (0: Non-Medical; and 1: Medical)

BLT Receive Status (0: Not Receiving; and 1: Receiving)

3.2.2. Regression Model Fit Test

In this study, binary logistic regression analysis was used to determine the variables that affected the participation of working women in helping the household economy. The research data obtained were then processed using the SPSS program. Before the binary logistic regression analysis was carried out, it was necessary to test the suitability of the logistic regression model used in the study using the Hosmer and Lemeshow Goodness of Fit Test.

Table 2. Hosmer and Lemeshow Goodness of Fit Test

| Step | Chi-square | df | Sig. |
|------|------------|----|-------|
| 1 | 2.424 | 8 | 0.965 |

Based on Table 2 above, the chi-square significance value was 0.965, greater than the 0.05 significance level, so the decision failed to reject H0. It can be concluded that with a 95% confidence level the logistic regression model used was appropriate to explain women's participation in household economic activities in Kemuning Lor Village.

3.2.3. Simultaneous Test

Simultaneous submission of parameter estimators was done by looking at the output of research data processing using SPSS, namely the G test value. Simultaneous parameter testing was carried out to determine the effect of all independent variables in the study on the dependent variable simultaneously. The hypotheses for simultaneously testing the significance of the regression parameters were:

$$H_0: \beta_1 = \beta_2 = \dots = \beta_5 = 0$$

$$H_1: \text{There is at least one } \beta_j \neq 0; j = 1, 2, \dots, 5$$

H1 rejected if p-value < α , for $\alpha = 0.05$. Simultaneous test results were obtained from the Omnibus Test of Model Coefficient table.

Table 3. Omnibus Test of Model Coefficient

| | | Chi-square | df | Sig. |
|--------|-------|------------|----|-------|
| Step 1 | Step | 55.472 | 11 | 0.000 |
| | Block | 55.472 | 11 | 0.000 |
| | Model | 55.472 | 11 | 0.000 |

Based on the results of the Omnibus test, it showed that the significance value of the G test is 0.000, which was smaller than the 0.05 level of significance. The decision taken was to reject H0. This meant that there was at least one independent variable that could explain the participation of women in household economic activities in Kemuning Lor Village.

3.2.4. Partial Test

Based on the results of the simultaneous test, it was known that there was at least one independent variable that significantly influences women's participation in household economic activities in Kemuning Lor Village. The next stage was to do a partial test, to find out how many independent variables have a significant influence on women's participation in household economic activities in Kemuning Lor Village. Partial testing was carried out with the Wald test statistic. The results of the partial test can be seen in Table 1 Parameter Estimation. The independent variable that had a significant effect on women's participation in household economic activities in Kemuning Lor Village was the independent variable that had a Wald test significance value of less than 0.05. Table 1 shows that the significance value of the independent variables of wife's age, married age, number of family dependents, number of school children, age at first giving birth, childbirth assistance, total income, total expenditure, BLT acceptance status, and husband's age was greater than the significance level. 0.05, thus giving the decision to fail to reject H0. However, the **wives' income** had a significant value that was smaller than the 0.05 level of significance, thus giving the decision to reject H0. Therefore, it can be concluded that the variable that significantly affected women's participation in household economic activities in Kemuning Lor Village was the **wives' income variable**. Meanwhile, the variables of the wives' age, married age, number of family dependents, number of school children, age of first birth, childbirth assistance, total income, total expenditure, BLT acceptance status, and husband's age did not significantly affect women's participation in household economic activities in partially.

3.2.5 Association Expectations and Measurements

Table 4. Summary Model

| Step | -2 Log likelihood | Cox & Snell R Square | Nagelkerke R Square |
|------|-------------------|----------------------|---------------------|
| 1 | 20.461 | 0.616 | 0.844 |

Table 4 shows that how far the diversity of the Y response variables can be explained by the predictor variable Xi by looking at the Nagelkerke R-square. In this case, the value of 84.4% was obtained, which means that 84.4% of the diversity of the response variables of working women could be explained by predictor variables.

3.2.6 Sensitivity and Specificity

Table 5 shows that the formed logistic regression model could make a classification in estimating the Y value, which was 93.1%. This figure shows that overall, the model used could predict women's participation in household economic activities in Kemuning Lor Village by 93.1 percent.

Table 5. Classification

| Observed | | Predicted | | Percentage Correct |
|--------------------|----------|--------------|----------|--------------------|
| | | Working wife | Not work | |
| Working wife | Not Work | 19 | 2 | 90.5 |
| | Work | 2 | 35 | 94.6 |
| Overall Percentage | | | | 93.1 |

3.2.7 Odds Ratio Interpretation

Based on the results of the analysis, the only significant variable was the wife's income. The value of Exp(B) on the wife's income variable was 629,876 meaning that the higher the wife's income, the higher the tendency of women to work.

4. CONCLUSION

Based on the results of the study, it was known that the participation rate of women in playing a role in supporting the family economy was 64%. Many kinds of women's professions in Kemuning Lor. Based on the survey results, it was known that as many as 25% of the female population who worked in agriculture were landowners/farmers. Then as many as 6% of the female population worked as odd farm laborers, 12% as coffee farmers, 18% as sugarcane workers, 14% as workers in the non-formal sector such as tailors, selling food, stalls. From that analysis, it was known that women's income partially influenced the women to work. The partial test showed that the most influential variable for working women was income with Exp(B) of 629,876 meaning that the higher the wife's income, the higher the tendency of women to work.

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REFERENCES

- [1] B. Arifin, "Analysis of Indonesian Agricultural Economics." Buku Kompas Publishers. Jakarta, 2004.
- [2] R. Iskandar, "Analysis of the Sustainable Status of Post Disaster Crop Production in Sigi Regency, Central Sulawesi Province," in *IOP Conference Series: Earth and Environmental Science*, 2021, vol. 672, no. 1, p. 12031.
- [3] I. Widyarini, D. D. Putri, and A. R. Karim, "Peran Wanita Tani Dalam Pengembangan Usahatani Sayuran Organik Dan Peningkatan Pendapatan Keluarga Di Desa Melung Kecamatan Kedungbanteng (The Role of Women Farmers in the Development of Organic Vegetable Farming and Increasing Family Income in Melung Village, Kedungbanteng District)", *Pembang. Pedesaan*, vol. 13, no. 2, 2013.
- [4] T. A. Arsanti, "Perempuan dan pembangunan sektor pertanian (Women and agricultural sector development)," *J. Maksipreneur Manajemen, Koperasi, dan Entrep.*, vol. 3, no. 1, pp. 63–74, 2013.
- [5] J. P. HUTAJULU, "Analisis Peran Perempuan dalam Pertanian di Kecamatan Rasau Jaya Kabupaten Kuburaya (Analysis of the Role of Women in Agriculture in Rasau Jaya District, Kuburaya Regency)," *J. Soc. Econ. Agric.*, vol. 4, no. 1, pp. 83–90, 2015.
- [6] M. S. Suraningsih, A. V. S. Hubeis, D. Sadono, D. Susanto, and A. Saleh, "Women Farmer's Participation and Empowerment to Support Family Food Self-Sufficiency," *Mimb. J. Sos. dan Pambang.*, vol. 32, no. 2, pp. 319–329, 2016.
- [7] P. Sajogyo, "Peranan wanita dalam perkembangan ekonomi (The role of women in economic development)," *Obor. Jakarta*, 1994.
- [8] Badan Pusat Statistik Kabupaten Jember, *Kabupaten Jember Dalam Angka*. Jember, 2019.
- [9] J. A. Oladejo, S. O. Olawuyi, and T. D. Anjorin, "Analysis of women participation in agricultural production in Egbedore local government area of Osun State, Nigeria," *Int. J. Agric. Econ. Rural Dev.*, vol. 4, no. 1, pp. 1–11, 2011.
- [10] D. W. Hosmer Jr, S. Lemeshow, and R. X. Sturdivant, *Applied logistic regression*, vol. 398. John Wiley & Sons, 2013.
- [11] M. A. Damisa and M. Yohanna, "Role of rural women in farm management decision-making process: Ordered probit analysis," *World J. Agric. Sci.*, vol. 3, no. 4, pp. 543–546, 2007.