Factors affecting participation of women farmers in supporting family food security: case study in Pandeglang regency, Indonesia

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Abstract. The potential of women farmers in achieving household food security must be supported by adequate female farmer capacity, optimal participation of women farmers at every stage, and eliminating and finding solutions to a number of obstacles faced by women in order to strengthen their capacity and increase their participation in achieving home food security stairs. The purpose of this study is to analyze the factors that influence the participation of female farmers in supporting family food security. The population in this study were female farmers in two sub-districts in Pandeglang District, Banten Province, namely Munjul and Cibaliung Districts. The number of samples is 125 female farmers. The research activities were carried out for three months (April to June 2019). Data analysis with the inferencing statistics used are SEM using LISREL 8.73 (Linear Structural Relationships). The results showed that the factors that influence the participation of female farmers in supporting family food security are access to resources, physical and socio-economic support and extension support. For this reason, government support is needed, by giving attention to women farmers as the main actors in achieving food security in rural households.

Keywords: participation, women farmers, family food security

1. Introduction
Socio-culturally, peasant women in Pandeglang Regency are responsible for achieving household food security. Therefore, the success of achieving household food security in Pandeglang Regency cannot neglect the role of women farmers. The potential of peasant women in achieving household food security must be supported by adequate capacity of peasant women, optimal participation of peasant women at each stage, and eliminating and finding solutions to a number of obstacles faced by women in order to strengthen their abilities and increase their participation in achieving home food security stairs.

Farmer women play an important role in household food security, both in the components of food availability, food access and food utilization. Farmer women contribute as workers in the agricultural sector. In 2010, in Latin America and the Caribbean there were approximately 20 percent of women in the agriculture sector, in Near East and North Africa and Sub-Saharan Africa nearly 50 percent, in South Asia around 35 percent, and in East and Southeast Asia nearly 50 percent. percent. Farmer women are also responsible for planning, processing, preparing, and serving food for the family [1], [9].
Farmer women are exclusively responsible for family nutrition, as producers and providers of food for families [6]. Farmer women also buy food using the income they get from working [7], [14], [4], [5], [9]. The International Center for Research on Women / ICRW states that farm women are also an integral part of efforts to reduce hunger and malnutrition because it is women who are responsible for ensuring the availability of balanced, nutritious food for their families.

Farmer women also carry out household strategies to meet food shortages (coping ability indicator) [3], [1], [7], [17], [2], [5]. The above description reinforces that the participation of women farmers in achieving household food security is not only related to increasing food production and food providers but also with increasing food and nutrition of household members. Alignment must occur between increased food production and income with improved food and nutritional status of households [2], [9]. This supports the opinion that household food security is the ability of households to meet the adequacy of food for their members to be able to live healthy lives and be able to carry out daily activities that are reflected in the consumption of nutrients (energy and protein) that meet the adequacy norms [12], [8]. According to [10] efforts to achieve household food security can be pursued through increasing food and nutrition knowledge to maintain harmony between food availability and the quality of community food consumption.

To increase one’s participation requires certain capability requirements in their implementation and analyzing social, economic and cultural factors (personal characteristics of farm women, household socioeconomic households, socio-cultural environmental support, access to resources, and support for counseling) that affect ability and participation and find a way out. Supporting the implementation of food security counseling for farm women is needed to succeed household food security, because extension workers have a very strategic role [13].

The instructor should not only understand the production aspects but also need to have adequate knowledge, attitudes and skills in terms of consumption patterns, food distribution in order to provide correct information to farmer women in relation to food consumption and distribution patterns. The achievement of household food security gives meaning to the fulfillment of the rights of all individuals in the household to quality food (quality, balanced nutrition) at all times and can live a healthy and active life, as mandated by [15] Law of the Republic of Indonesia Number 18 2012 concerning Food. Household food security will determine the achievement of national and even global food security. Food security and nutrition are the common thread connecting various elements of sustainable future development. Food insecurity can have a long-term negative impact on the growth prospects of the whole community. Therefore, the government must continue to pay attention to farm women as the main actors in achieving household food security in rural areas. The purpose of this study is to analyze the factors that influence the participation of women farmers in supporting family food security.

2. Materials and Methods
This research is quantitative research supported by qualitative data. The research design is descriptive which takes a sample in one population using a questionnaire as a primary data collection tool [16] and aims to make a description of the situation or event from sample to population so that conclusions can be drawn. The research activities will be carried out for 3 months from April to June in 2019 in two sub-districts in Pandeglang District namely Munjul District and Cibaliung District. The sample in this study was 125 peasant women from two sub-districts.

The research uses survey methods and data analysis is done by descriptive statistics and inferential statistics. Inference statistics are used to estimate or estimate the population (generalization) in order to see the extent to which independent variables influence the dependent variable and to see the compatibility of the research model designed with the actual model. Statistical inference used is SEM by using LISREL 8.73 (Linear Structural Relationships). Determination of the sample in the study was carried out through two stages, namely the first stage was to determine the number of research samples. The size of the research sample follows the rules in the analysis of Structural Equation Modeling (SEM) with a maximum likelihood estimation method requiring a minimum sample of 100-150 respondents or as much as five times the indicators in the model [11]. In this study there were 25
indicators and the number of samples taken was 5 x 25 = 125 people. The number of samples in this study met the requirements for SEM testing. The second stage is to determine respondents in each selected village. The instrument used in this study was in the form of a questionnaire containing a list of questions made on the basis of predetermined variables.

Questionnaire in the form of a list of questions and guideline questions in the form of a number of key questions to find out qualitative phenomena from respondents and informants related to the problem and research objectives. The collected data was analyzed using inferential statistics. To give an idea of the factors that influence the participation of female farmers, the variables studied are: farmer characteristics (X1), access to resources (X2), economic and physical support (X3), extension support (X4), participation rates, (Y1) and food security (Y2).

The hypothesis in this study is that the level of participation of female farmers in supporting family food security is influenced by the characteristics of farmers, access to resources, physical and socio-economic environmental support, and extension support. Structural Equation Model and measurement model with the following formula:

(1) Structural Equation Model, is:

\[ \eta = B\eta + \Gamma\xi + \zeta \]

Description :
- \( \eta \) = eta, vektor from endogenous variable (Y)
- \( B \) = beta, a coefficient matrix describing the effect of other endogenous variables
- \( \Gamma \) = gamma, a coefficient matrix describing the effect from the exogenous variable to the endogenous variable
- \( \xi \) = xi, a vector of exogenous variables (latent variables X)
- \( \zeta \) = zeta, a vector of residuals or errors in the equation

(2) Measurement Model, is:

\[ X = \Lambda x\zeta + \delta Y = \Lambda y\zeta + \epsilon \]

Description :
- \( X \) = a vector of measurement of free variables
- \( \Lambda x \) = lambda X, a matrix of loading X on the latent variable exogenous which is not observed
- \( \delta \) = delta, a vector of related measurement errors with X variables
- \( \Lambda y \) = lambda Y, a matrix of loading X on the endogenous variable not observed
- \( \epsilon \) = epsilon, a vector of related measurement errors with Y variables

3. Results and Discussion

The results of hypothesis testing indicate that the factors that influence the level of participation of women farmers in supporting family food security are access to resources (X2), physical and socio-economic environmental support (X3), and extension support (X4). However, the level of participation of female farmers was more dominantly influenced by access to resources by 0.53, when compared to the influence of physical and socio-economic environmental support, and extension support by 0.33 and 0.39, respectively. The positive influence shows that the higher access to resources, physical and socio-economic environmental support, and extension support will further increase the participation of women farmers in supporting family food security.

The estimation of structural model parameters between the tested variables, namely: \( Y1 = 0.53 \times X2 + 0.13 \times X4 \), with \( R2 = 0.57 \) meaning that the simultaneous influence of the two variables on the level of participation of women farmers in supporting family food security is 0.57. This means that the
diversity of data that can be explained by the model is 57 percent, while the rest (43%) is explained by other variables (which are not yet in the model) and errors.

Figure 1 shows the factors that influence the level of participation of women farmers in supporting family food security. Factors affecting the level of participation of female farmers were analyzed using structural equation modeling (SEM) with the help of the LISREL 8.72 program, which was initially estimated or tested on the parameters of the model (framework of thought). Testing the model using a two-step procedure (two step approach). First, testing the Goodness of fit model. Second, the results of processing for testing the goodness of fit by using alternative testing for the use of SEM indicators, namely the results of processing for testing the goodness of fit by using an alternative testing for the use of SEM indicators, namely the results of several measurement indicators test results in the conclusion that the model meets the criteria for goodness of fit.

According to the criterion size RMSEA (Root Mean Square Error of Approximation) produces a value of $0.070 \leq 0.080$ which means that the resulting model is fit. The use of other good fit criteria namely GFI (Goodness of Fit Index), AGFI (Adjusted Goodness of Fit), CFI (Comparative Fit Index), IFI (Incremental Fit Index), and NFI (Normed Fit Index) produce values $\geq 0.90$ which means the resulting model is already good fit (Table 1). The test results of several measurement indicators produce the conclusion that the model meets the criteria for goodness of fit, so that hypothesis testing can be done.

Table 1. The results of testing the goodness of fit model of factors that influence the level of participation of women farmers in supporting family food security.

| Goodness-of-Fit | Cutt-off-Value | Result | conclusion |
|-----------------|---------------|--------|------------|
| RMSEA           | $\leq 0.08$   | 0.070  | Fit        |
| GFI             | $0.80 \geq \text{GFI} \geq 0.90$ | 0.87   | Fit        |
| AGFI            | $0.80 \geq \text{AGFI} \geq 0.90$ | 0.83   | Fit        |
| CFI             | $\geq 0.90$   | 0.97   | very Fit   |
| IFI             | $\geq 0.90$   | 0.97   | very Fit   |
| NFI             | $\geq 0.90$   | 0.94   | very Fit   |

The proposed construct measurement model is fit with the data. This means that the model is able to estimate the covariance matrix of sample data. In other words, the model can be used as a basis for making generalizations about the phenomena under study. In summary based on the estimation of structural model parameters between the tested variables, it can be seen that access to resources directly influences the level of participation of women farmers in supporting family food security, this is because the input factors and farming technology support the participation of farmers in managing their farming. Physical social economic support affects the participation of women farmers, especially in terms of government policy support, support of farmer leaders, institutional support, infrastructure support, and expert support. In addition, extension support also affects the participation of farmers, especially in supporting family food security. Dal is supported by material that is suitable to the needs of farmers, high intensity of counseling and good extension agent. The participation of women farmers is reflected by the participation variable with indicators of implementation ($\lambda = 0.93$) and implementation ($\lambda = 0.80$). Farmer participation, especially in the implementation phase, is very much needed for improvement. The more farming is carried out properly and in accordance with the rules, the more weaknesses will be known and can later be corrected in the next planting season.

3.1. Level of participation

The level of participation of women farmers in supporting family food security in both districts is classified as moderate. This can be seen in Figure 1 where it can be seen that farmers from Cibaliung
and Munjul sub-districts have a moderate level of participation, however, Munjul sub-district is relatively more participatory than farmers from Cibaliung sub-district.

![Figure 1. Participation level of women farmers](image-url)

3.2. Farmers Women's Participation Rate

Based on Figure 1, it can be seen that the element of participation that supports family food security from the aspect of availability and distribution aspects is implementation and benefits. This shows that in general women farmers from two districts conduct farming activities to support the food security of their families so that the availability of food in their homes can be guaranteed. In addition, some of the results of his farming are distributed to be sold and bought other food needs besides rice. The participation of women farmers from the aspect of benefits is to use the results of their farming for family food sufficiency. Thus it can be concluded that the involvement of farm women in farming can support family food security, especially in the aspects of availability and distribution aspects.

4. Conclusion

Factors that influence the participation of women farmers in supporting family food security are access to resources, physical and socio-economic support and extension support. To support family food security, support from the government is needed, especially access to resources, support for physical and socio-economic facilities and extension support.

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