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# Analysis of factors influencing farmers' decision to continue herbal plant farming in Pace Village, Silo District, Jember Regency

**Eliyatiningsih[1], Iqbal Erdiansyah[1], Vega Kartika Sari[2], Dwi Nurahmanto[3]**

[1] *Department of Agriculture Production, State Polytechnic of Jember, Indonesia*
[2] *Faculty of Agriculture, Universitas Jember, Indonesia*
[3] *Faculty of Pharmacy, Universitas Jember, Indonesia*

*Correspondence should be addressed to:*
*Eliyatiningsih*
*eliyatiningsih@polije.ac.id*

**Abstract:**
Pace Village, Silo District, is a center for herbal plant production and is the largest ginger producer in Jember Regency. Farmers in the area have been cultivated various herbal plants for the past five years, both as main plants in their yards and as intercrops in addition to coffee plants. The outbreak of Covid 19 in 2019 has had a positive impact on herbal plant farmers in Pace Village because the demand and sales of herbal medicines have increased sharply. This study aims to determine the factors that influence farmers' decisions to continue herbal farming in Pace Village, Silo District, Jember Regency. The determination of the research location was carried out by purposive sampling and the respondents of this study were 35 farmers who cultivate herbal plant. The data analysis technique used was logistic regression with the help of the IBM SPSS 22 program. The results showed that the factors that influenced the probability of farmers continuing herbal plant farming were age, land area, farming experience, motivation, and membership in farmer groups. Based on the research results, it is recommended that the government support the development of herbal farming in Pace Village so that it becomes the main farming business that can provide optimal benefits for farmers.

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## INTRODUCTION

Herbal farming in Indonesia may not be as popular as food crop farming, horticultural crops, or plantation crops. This is because herbal commodities are not the main food commodities that are widely sought after by the community. However, the data shows that herbal farming from year to year continues to grow in line with the increasing demand for herbal plants and the trend of people choosing to consume herbal medicines rather than chemical drugs. Herbal plants with high natural antioxidant content are again used as an alternative in maintaining body health. In addition to being cheap and easy to obtain, Indonesian herbal plants are also safe to use (Darsini & Aryani, 2022).

Intensification in the cultivation of herbal plants is being encouraged again, both on a large scale in industry and on a household scale in home yards. On a large scale, the use of herbal plants in recent years has tended to increase in line with the development of the herbal medicine industry (Alfathir & Muksin, 2021). Meanwhile, on a household scale, the cultivation of herbal plants in the yard is more aimed at meeting the needs of traditional family medicines (Sahelna, 2019). In addition to being used as medicine, herbal plants are also widely used as spices in typical Indonesian dishes (Ratnawati et al., 2022).

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Jember Regency has great potential in developing herbal plants. The region with an area of 3,293.34 km2 is still dominated by the agricultural sector, so the economy is still focused on this sector. Pace Village in Silo District is the largest ginger producer in Jember Regency with production reaching 55% of the total ginger production in Jember Regency (BPS Jember Regency, 2021). In addition to ginger, the potential for herbal plants in Pace Village is also quite large, including *temulawak*, lemongrass, Javanese chili, cardamom, and so on. Although it produces large quantities of production, herbal plant farming is still a side business for most farmers in Pace Village (Eliyatiningsih et al., 2023). So far, farmers have still been cultivating herbal plants by intercropping as intercropping between coffee plants (Sari et al., 2022). This is because farmers still do not get information related to market prospects and post-harvest processing of herbal plants.

Based on the background that has been presented, research related to the factors that influence farmers' decisions to continue herbal farming is important to conduct. Farming activities are production activities (input) to produce a product (output), where farming activities cannot be separated from the use of production factors to produce a product, which is then sold so that a profit will be obtained. Several studies show that the sustainability of a farming business will be influenced by the characteristics of the farmers themselves, including formal education, farming experience, and land area (Pinem, 2019; Galatia et al., 2023). Meanwhile, Arum et al. (2025) in their research stated that farmers' decisions to continue their farming business were strongly influenced by motivational factors.

## METHOD

This research was conducted in Pace Village, Silo District, Jember Regency, East Java in 2022. The determination of the research location was carried out by purposive sampling, considering that the research location is the largest herbal plant production center in Jember Regency. The data obtained in this study consists of primary data and secondary data. Primary data were obtained based on direct interviews with farmers with the help of questionnaires, while secondary data were obtained from related institutions or agencies. Respondents in this study were farmers who have been cultivating herbal plants for the past 5 years. Respondents in this study were 35 farmers selected by simple random sampling using the Slovin Method with the following formula (Nalendra et al., 2021):

$$n = \frac{N}{1+Ne^2}$$

Description:
n = sample size
N= population size
e = significance level (5%)

Binary Logistic Regression was used to identify the determinants of farmers' decisions to continue herbal farming. Data analysis was carried out using the IBM SPSS 22 program. The regression model is specified as follows:

$$g(x) = \ln\left[\frac{\Pi(x)}{1-\Pi(x)}\right] = \beta_0 + \beta_1 X_1 + \ldots + \beta_7 X_7$$

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Where:

| | |
|---|---|
| g(x) | = the farmer's decision to continue herbal farming (1=continue; 0=otherwise) |
| $\beta_0$ | = intercept |
| $\beta_1$ - $\beta_7$ | = parameter coefficient of the independent variable |
| X1 | = age (years) |
| X2 | = education (years) |
| X3 | = land area (ha) |
| X4 | = herbal plants farming experience (years) |
| X5 | = family members (people) |
| X6 | = motivational factor (1 = high motivation; 0 = otherwise) |
| X7 | = membership in farmer group (1 = farmer group member; 0 = otherwise) |

## RESULT

### Descriptive Statistics of The Respondent

Pace Village is administratively a village in Silo District, Jember Regency. Silo District is one of the districts located on the easternmost side with a distance of about 33 km from the capital of Jember Regency. Pace Village is one of nine villages in Silo District, Jember Regency. Pace Village with an area of 51.29 km2 is divided into rice fields with an area of 99.5 Ha, dry land areas used as dry fields covering an area of 448 Ha, plantation land areas covering an area of 1,005 Ha, public facility land covering an area of 13.20 Ha, forest areas covering an area of 2,112 Ha, and used as settlements covering an area of 268 Ha (BPS Jember Regency, 2021). The population of Pace Village is 16,955 people, and most of them work in the agricultural sector, namely 8,190 people as owner and tenant farmers, and 6,614 people as farm laborers (BPS Jember Regency, 2020). Agricultural commodities planted by the community in Pace Village are coffee, coconut, rubber, pepper, and ginger. The type of commodity that is most widely cultivated is coffee. For herbal plants, they have so far been cultivated as intercropping plants in coffee plantations.

Table 1. Descriptive analysis of the variables used in the model

| Variables | Description | Mean | Standard Deviation |
|---|---|---|---|
| Farmers' decision to continue herbal farming | 1= continue<br>0= otherwise | 0.80 | 0.406 |
| Age | Continuous | 52.97 | 11.838 |
| Education Level | Continuous | 7.60 | 2.746 |
| Land Area | Continuous | 0.48 | 0.326 |
| Farming Experience | Continuous | 5.86 | 1.458 |
| Number of Family Members | Continuous | 2.51 | 1.067 |
| Farmers Motivation | 1 = high motivation<br>0= otherwise | 0.20 | 0.406 |
| Membership in Farmer Group | 1 = farmer group member<br>0 = otherwise | 0.26 | 0.443 |

Table 1 shows that the average age of farmers in the study area is classified as productive age worker, which is 53 years old (Othman et al., 2015). Farmers will be able to work optimally in their farming when they are at a productive age. Education level characteristic can be defined as the length of time spent by farmers in formal education. The level of education will determine the level of farmers' ability to adopt technology and innovation. The higher the level of education of farmers, the faster the rate of adoption of technology and innovation by farmers in supporting the success of

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their farming businesses (Harahap, 2021). The average level of education of farmers in the study area is 8 years or at the Junior High School level.

Land is the most important component in farming because it affects the scale of farming production, costs, production volume, and farming profits (Syathori & Verona, 2020). The average land area for herbal cultivation in the research area is 0.48 Ha. The land is, on average, located in the farmer's yard, and some are located together with coffee cultivation land. The other characteristic of the other farmers, based on the research, is farming experience. Farming experience is an important factor for farmers to carry out their farming activities. There is a tendency that the longer the experience of farming, the more skilled the farmer will be in farming, which will affect the success of his farming. The results show that the average experience of herbal farming by farmers is more than 5 years. The average number of family members in the research area is more than 2 people. The number of family members greatly affects the income and expenses of farmers. The more family members, the greater the cost of living that must be met by the head of the family.

Another farmer's characteristics in this study include farmer motivation to cultivate herbal plants and farmer group membership. The level of farmer motivation in this study was measured by evaluating the relationship between the categories of needs according to the ERG Theory (existence, relatedness, growth) with herbal farming in Pace Village. Based on the results of the analysis, the average level of farmer motivation is at a moderate level. Meanwhile, for the membership factor in farmer groups, a distinction will be made between farmers who are members of farmer groups and those who are not.

**Factors Influencing Farmers' Decisions to Continue Herbal Farming in Pace Village**

Most farmers in Pace Village are farmers who cultivate coffee as their main commodity. So far, herbal farming has only been a side business with an intercropping system between coffee plantations or only cultivated on a small scale in their yards. Based on the research, the contribution of herbal farming income is not up to 50% of the total income of farmers' farming businesses. However, herbal farming began to grow in early 2019 when the COVID-19 pandemic occurred. The increasing demand for herbs caused farmers to start actively cultivating herbal plants. After Covid-19, local farmers continued to cultivate herbs on a smaller scale.

Farmers' decisions to continue herbal farming are greatly influenced by external and internal factors. External factors, for example, are market demand for herbal products, support from farmer groups, and village government policies to require their communities to continue planting herbs. While internal factors include socio-economic factors that exist in individual farmers. In this research, the decision of farmers to continue herbal farming is influenced by several factors, including age, education level, land area, farming experience, number of family members, farmer motivation, and farmer group membership status. To determine these factors, a logistic regression analysis was conducted. The variable of the decision to continue herbal farming becomes the dependent variable which is influenced by the independent variables, namely age ($X_1$), education level ($X_2$), land area ($X_3$), herbal farming experience ($X_4$), number of family members ($X_5$), farmer motivation ($X_6$), and farmer group membership($X_7$).

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Table 2. Binary logistic regression model parameter estimation

| Variable | Coeffisien | Odds Ratio | P-value |
|---|---|---|---|
| Intercept | 0.994 | 0.06 | 0.331 |
| Age (X1) | 0.702 | 1.06*** | 0.002 |
| Education (X2) | 0.337 | 1.29 | 0.562 |
| Land Area (X3) | 3.546 | 0.04* | 0.060 |
| Farm Experience (X4) | 3.578 | 4.36* | 0.059 |
| Family Member (X5) | 2.194 | 3.35 | 0.699 |
| Motivation (X6) | 2.005 | 0.15* | 0.057 |
| Farmer Group Membership (X7) | 1.060 | 4.44*** | 0.003 |
| Chi Square | 25.091 | | |
| Hosmer and Lemeshow Test | 0.941 | | |
| Nagelkerke R Square | 0.591 | | |
| Omnibus Tests of Model Coefficients | 0.000 | | |

Based on Table 2, the model feasibility test conducted includes the Hosmer and Lemeshow Test, which shows a significance level of 0.941 or greater than the alpha value of 0.05. So, it can be said that the logistic regression model is feasible to use. This value indicates that there is no significant difference between the predicted classification and the observed classification. Simultaneous Test based on table 2, the results of the Omnibus Tests of Model Coefficients' significance value are smaller than alpha 5%, so it can be said that the regression treatment shows a real or significant difference. In other words, it is said that all independent variables together influence the dependent variable.

Determination Coefficient Test from the results of the logistic regression analysis can be seen from the Nagelkerke R Square value or determination coefficient. The value is 0.591, and it indicates that the influence of the independent variable on the dependent variable is 59.1%, while the remaining 40.9% can be explained by variables outside the model. Based on the results of the logistic regression analysis, the independent variable partially affects the dependent variable. Based on the result, the factors that influence the probability of farmers to continue farming herbal plants are age, land area, farming experience, motivation, and membership in farmer groups, while the number of family members and farmer education levels do not have a significant effect.

## DISCUSSION

The farmer's decision to continue farming is strongly influenced by many factors, namely factors that exist from within the farmers themselves, such as age, education level, farming experience, and motivation. While other factors, such as membership in farmer groups, are also thought to influence farmers' decisions in managing their farming businesses. This study aims to identify internal and external factors that influence farmers' decisions to continue herbal plant farming. This research was conducted at the herbal production center in Jember district. Pace Village, Silo District is the largest producer of herbal plants, especially ginger production. Herbal farming has been carried out by farmers in the last 10 years and has been cultivated more intensively since the outbreak of the COVID-19 virus.

Based on the results of the logistic regression analysis, it can be seen that the factors that influence farmers' decisions to continue herbal farming are age, land area, farming experience, motivation, and membership in farmer groups, while the number of family members and farmer education levels do not have a significant effect. The age of farmers in this study significantly influenced the probability of farmers making decisions to continue herbal farming. The age of farmers

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is one of the factors related to the ability of farmers to work in carrying out farming activities. Age influences the physical ability of farmers in carrying out farming activities (Eliyatiningsih & Mayasari, 2018). The age of farmers in this study was at their productive age. A productive age can support good farming management, so that it can help achieve optimal production (Sarina et al., 2015).

Another factor that influences the probability of farmers continuing herbal farming is the land area. The wider the land owned by farmers, the more serious the farmers will be in carrying out their farming (Juliana et al., 2018). Meanwhile, the farming experience factor will also increase the probability of farmers continuing herbal farming. More experienced farmers tend to have better knowledge and skills in managing land, choosing superior varieties, controlling pests and diseases, and optimizing the use of resources. This experience enables farmers to make more informed decisions, increase productivity, and ultimately increase income (Jairu & Acharya, 2022).

Based on the results of the logistic regression analysis, it is also known that the farmer motivation variable affects the probability of farmers continuing herbal farming. Although herbal commodities are not the main commodities cultivated by farmers, the demand for herbal plants is still high, so that herbal farming is very promising economically. This is the reason for farmers to continue to cultivate herbal plants. In line with Nisa (2015), which states that farmers' motivation in choosing the commodities to be cultivated will affect the way they manage their farming and prepare for risks optimally, so that the production obtained will be optimal.

Based on the partial test, it was also stated that membership in a farmer group would affect the possibility of farmers continuing herbal farming. Farmer groups have an important role in increasing productivity and farm income. Through farmer groups, farmers can learn, work together, and access better resources, which ultimately have a positive impact on crop yields and farm profits (Handayani et al., 2019).

Based on the research results, it is known that factors that do not affect the probability of farmers continuing herbal farming are education level and number of family members. Several studies have shown that the age of farmers does not directly affect the income or productivity of farming. The number of members is also not always a consideration for farmers running their farming businesses. Many studies state that farmers pay more attention to the selling price of agricultural products and farming risks in choosing commodities for cultivation (Indrawanto et al., 2003).

Finally, even though herbal plant is not a main crop and are cultivated on a small scale, it is hoped that herbal cultivation will continue to be carried out intensively by farmers. The potential of natural resources and market demand are expected to be the main reasons for the government to optimize herbal farming. Based on the research results, the government is expected to be able to increase farmer motivation and optimize the farmer groups, for example, by holding training or technical guidance related to the cultivation, processing, and marketing of herbal products.

The limitation of this study is that it only interviewed 35 respondents, which still does not describe the overall situation. The interviews and short FGDs conducted have not explored the problem in depth. Further researchers can conduct more specific research so that the variables become complete and comprehensive.

## CONCLUSION

Cultivation of herbal plants in Pace Village has been carried out intensively for the past 10 years. Although not a primary commodity, the potential of herbal plants is very large. Farmers' decisions to continue herbal farming are influenced by several factors, including age, land area, farming experience, motivation, and membership in the farming business. Based on the research

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results, it is recommended that the government pay more attention to the cultivation of herbal plants because of the abundant potential resources. Thus, it is expected that farmers can increase the production of herbal plants and their income.

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## CONFLICT OF INTEREST

The authors declare no conflict of interest.

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