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## **Factors affecting farmers' motivation in the development of shallot farming in Besowo Village, Kediri, East Java**

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**Abstract**---Shallot farming development is crucial for improving farmers' income and agricultural sustainability. This study aims to analyze the effects of intrinsic and extrinsic factors on farmers' motivation and farming development, and to investigate the mediating role of motivation. A quantitative survey was conducted with 70 shallot farmers in Besowo Village Kediri East Java, using saturated sampling. Data were analyzed using SEM-PLS with SmartPLS 4. The results show that intrinsic factors have a positive and significant effect on farmers' motivation (path coefficient 0.722,  $p < 0.001$ ), while extrinsic factors do not significantly affect motivation ( $p = 0.678$ ). Furthermore, intrinsic factors, extrinsic factors, and farmers' motivation do not significantly affect shallot farming development. Farmers' motivation also fails to mediate the effects of intrinsic and extrinsic factors on farming development. These findings indicate that farming development is a complex phenomenon influenced by factors beyond individual farmer characteristics and motivation. Therefore, comprehensive support through economic, technical, institutional, and policy interventions is required to promote sustainable shallot farming development.

**Keywords**---Intrinsic Factors, Extrinsic Factors, Farmers' Motivation, Shallot Farming Development, SEM-PLS.

## Introduction

The agricultural sector plays a strategic role in national development as it contributes to food provision, employment creation, income generation, and economic growth. Among various horticultural commodities, shallot (*Allium cepa* L.) is one of the most economically valuable and strategically important crops in Indonesia. Shallots are not only used as a primary cooking ingredient but also serve as a raw material for the food processing industry and contain bioactive compounds beneficial for health (Cozma et al., 2025; Fitri et al., 2023). The relatively stable demand throughout the year makes shallot a promising commodity for development. However, shallot farming still faces numerous challenges, including sharp price fluctuations, high production costs, climate change, and pest attacks (Nurhafni et al., 2022).

Kediri Regency, East Java Province, is one of the leading shallot production centers in Indonesia. According to the Central Bureau of Statistics of Kediri Regency (2025), shallot productivity reaches approximately 78.30 tons per hectare with a harvested area of about 188 hectares. Besowo Village, Kepung Sub-district, is one of the areas with significant potential for shallot development. However, the price of shallots in this region experienced substantial fluctuations throughout 2024, ranging from IDR 14,961 to IDR 37,846 per kilogram. This significant price difference indicates the high business risk faced by farmers, affecting their decisions to develop their farming operations.

Farmers' motivation is a key factor determining the success of farming development. Motivation is the driving force that encourages individuals to act in achieving specific goals. In the context of farming, motivation influences farmers' enthusiasm to increase productivity, adopt innovations, expand business scale, and maintain farming sustainability amidst various risks (Robbins & Judge, 2022). Farmers with high motivation tend to actively seek information, participate in extension activities, adopt technological innovations, and make efforts to improve production outcomes and business efficiency. Conversely, farmers with low motivation tend to maintain existing cultivation practices and are less driven to make changes.

According to Alderfer's ERG Theory (*Existence, Relatedness, and Growth*), human motivation is influenced by three groups of needs: existence needs, relatedness needs, and growth needs (Alderfer, 1972). In farming activities, existence needs relate to farmers' desire to obtain income sufficient to meet family needs. Relatedness needs are reflected in farmers' relationships with farmer groups, agricultural extension workers, and fellow farmers in obtaining information and experience.

Meanwhile, growth needs are manifested through farmers' desire to improve capabilities, expand businesses, and develop farming operations to become more productive and sustainable.

Previous studies have shown that farmers' motivation is influenced by both intrinsic factors (internal characteristics such as age, education, farming experience, land area, and family dependents) and extrinsic factors (environmental support such as extension activities, agricultural information access, and government policies) (Tsarwah, 2022; Marlin et al., 2024). However, most previous studies have only examined partial relationships between variables. Research that simultaneously tests the direct effects of intrinsic and extrinsic factors on farming development and the mediating role of motivation remains relatively limited, particularly for shallot commodity.

Based on this background, this study develops a comprehensive research model integrating intrinsic factors, extrinsic factors, farmers' motivation, and shallot farming development into a single structural model. This study aims to: (1) analyze the effect of intrinsic factors on farmers' motivation; (2) analyze the effect of extrinsic factors on farmers' motivation; (3) analyze the effect of intrinsic factors on shallot farming development; (4) analyze the effect of extrinsic factors on shallot farming development; (5) analyze the effect of farmers' motivation on shallot farming development; (6) analyze the mediating role of farmers' motivation in the relationship between intrinsic factors and shallot farming development; and (7) analyze the mediating role of farmers' motivation in the relationship between extrinsic factors and shallot farming development.

## **Material and Methods**

This study employed a quantitative approach with a survey method. The research was conducted in Besowo Village, Kepung Sub-district, Kediri Regency, East Java Province, from March to May 2026. The location was chosen purposively because Besowo Village is one of the shallot production centers in Kediri Regency with diverse farmer characteristics. The village has eight hamlets, and most residents depend on agriculture, particularly shallot farming, as their main livelihood.

The population comprised all active shallot farmers in Besowo Village, totaling 70 farmers. Due to the relatively small population size, a saturated sampling (census) technique was employed, where all population members were selected as respondents. This sample size met the requirements for SEM-PLS analysis based on the 10-times rule, as the research model had four latent variables with a maximum of five indicators per construct (Hair et al., 2022).

This study used four latent variables: Intrinsic Factors ( $X_1$ ): Measured through five indicators: age, land area, number of family dependents,

education level, and farming experience. Extrinsic Factors (X<sub>2</sub>): Measured through three indicators: extension activities, agricultural information sources, and government support. The infrastructure indicator (X<sub>2.2</sub>) was eliminated from the final model due to low outer loading ( $0.403 < 0.70$ ). Farmers' Motivation (Y): Measured through three indicators based on ERG Theory: existence needs, relatedness needs, and growth needs. Shallot Farming Development (Z): Measured through three indicators: productivity improvement, farming intensification, and production scale enhancement.

Primary data were collected through structured questionnaires using a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree), supported by field observation and semi-structured interviews with farmers and agricultural extension workers (PPL). Secondary data were obtained from the Central Bureau of Statistics, the Kediri Regency Agriculture Office, the Besowo Village Government, farmer groups, and relevant scientific literature.

Data analysis was performed using Structural Equation Modeling-Partial Least Squares (SEM-PLS) with SmartPLS 4 software. Analysis was conducted in two stages: (1) evaluation of the measurement model (outer model) through convergent validity (outer loading  $\geq 0.70$ , AVE  $\geq 0.50$ ), discriminant validity (cross loading and Fornell-Larcker criterion), and reliability (Composite Reliability  $\geq 0.70$ , Cronbach's Alpha  $\geq 0.60$ ); and (2) evaluation of the structural model (inner model) through R-Square, Effect Size ( $f^2$ ), and hypothesis testing using bootstrapping with a significance level of 5% (t-statistic  $> 1.96$ , p-value  $< 0.05$ ) (Hair et al., 2022).

The conceptual model comprised four latent constructs: intrinsic factors (X<sub>1</sub>), extrinsic factors (X<sub>2</sub>), farmers' motivation (Y), and shallot farming development (Z). Intrinsic factors were measured using five indicators: age, landholding size, household dependents, educational level, and farming experience. Extrinsic factors consisted of four indicators: agricultural extension services, production facilities and infrastructure, access to agricultural information, and government support. Farmers' motivation was measured using three dimensions adapted from Alderfer's ERG theory, namely existence needs, relatedness needs, and growth needs. Shallot farming development was represented by three indicators: productivity improvement, production intensification, and expansion of production scale.

## **Results And Discussion**

### *Respondent Characteristic*

The majority of respondents were male (98.6%), with the highest age range of 41-50 years (37.1%). Educational level was predominantly elementary school (47.1%), while the highest family dependents category was 2-3 persons (52.9%). These characteristics indicate that

shallot farmers in Besowo Village are generally at productive age with relatively low formal education, but have considerable farming experience.

*Evaluation of Measurement Model (Outer Model)*

The evaluation results of the measurement model showed that all constructs met the validity and reliability criteria. After eliminating indicator X2.2 (Infrastructure), all retained indicators had outer loading values between 0.638 and 0.855 (Table 1). The AVE values for all constructs ranged from 0.488 to 0.615, with Composite Reliability > 0.70 (0.811-0.826), indicating that the constructs were reliable (Hair et al., 2022).

Table 1  
Outer Loading and Reliability Results

| Construct                       | Indicator               | Outer Loading | AVE   | Composite Reliability |
|---------------------------------|-------------------------|---------------|-------|-----------------------|
| Intrinsic Factors (X1)          | X1.1 Age                | 0.701         | 0.488 | 0.826                 |
|                                 | X1.2 Land Area          | 0.733         |       |                       |
|                                 | X1.3 Family Dependents  | 0.685         |       |                       |
|                                 | X1.4 Education          | 0.733         |       |                       |
|                                 | X1.5 Farming Experience | 0.638         |       |                       |
| Extrinsic Factors (X2)          | X2.1 Extension          | 0.814         | 0.590 | 0.811                 |
|                                 | X2.3 Information        | 0.703         |       |                       |
|                                 | X2.4 Government Support | 0.782         |       |                       |
|                                 |                         |               |       |                       |
| Farmers' Motivation (Y)         | Y1 Existence            | 0.835         | 0.615 | 0.825                 |
|                                 | Y2 Relatedness          | 0.646         |       |                       |
|                                 | Y3 Growth               | 0.855         |       |                       |
| Shallot Farming Development (Z) | Z1 Productivity         | 0.787         | 0.602 | 0.819                 |
|                                 | Z2 Intensification      | 0.743         |       |                       |
|                                 | Z3 Scale Production     | 0.797         |       |                       |
|                                 |                         |               |       |                       |

Source: Primary Data Processed (2026)

*Evaluation of Structural Model (inner Model)*

R-Square Values: The R<sup>2</sup> value for farmers' motivation was 0.451, indicating that intrinsic and extrinsic factors together explained

45.1% of the variance in motivation. The  $R^2$  value for shallot farming development was only 0.100, meaning the research model explained only 10.0% of the variance in farming development, with 90.0% explained by other factors outside the model. Effect Size ( $f^2$ ): Intrinsic factors had a moderate contribution to farmers' motivation (0.301), while the contributions of other variables to motivation and farming development were categorized as small to negligible. Hypothesis Testing, the results of hypothesis testing are presented in Table 2. Of the seven hypotheses proposed, only one was accepted.

Table 2  
Path Coefficients and Hypothesis Testing Results

| Hypothesis | Relationship | Original Sample | t-statistic | p-value | Decision |
|------------|--------------|-----------------|-------------|---------|----------|
| H1         | IF → FM      | 0.722           | 4.682       | 0.000   | Accepted |
| H2         | EF → FM      | -0.062          | 0.415       | 0.678   | Rejected |
| H3         | IF → FD      | -0.100          | 0.347       | 0.729   | Rejected |
| H4         | EF → FD      | 0.219           | 0.917       | 0.359   | Rejected |
| H5         | FM → FD      | 0.233           | 1.395       | 0.163   | Rejected |
| H6         | IF → FM → FD | 0.168           | 1.324       | 0.186   | Rejected |
| H7         | EF → FM → FD | -0.014          | 0.293       | 0.770   | Rejected |

Source: Primary Data Processed (2026)

Note: IF= Intrinsic Factors, EF= Extrinsic Factors, FM= Farmers' Motivation, FD= Farming Development

### 1. Effect of Intrinsic Factors on Farmers' Motivation

The study found that intrinsic factors have a positive and significant effect on farmers' motivation (path coefficient = 0.722,  $p < 0.001$ ). This finding indicates that farmers' internal characteristics, including productive age, land area, education level, farming experience, and family dependents, are the primary determinants of farmers' motivation. The indicators of land area (0.733) and education level (0.733) were the most dominant indicators in forming the intrinsic factor construct.

This result is consistent with previous studies by Marlin et al. (2024) and Tsarwah (2022), which reported that internal factors significantly contribute to increasing farmers' motivation. The finding also aligns with Rogers' (2003) diffusion theory, which states that individual characteristics determine the ability to accept innovations. Furthermore, it supports Alderfer's (1972) ERG Theory, particularly the *existence needs* and *growth needs* dimensions. Based on field observations, farmers in Besowo Village have long farming experience and consider shallot farming as their main income source and a means to improve family welfare. This strong economic motivation drives them to maintain and develop their farming operations.

## 2. Effect of Extrinsic Factors on Farmers' Motivation

Contrary to intrinsic factors, extrinsic factors did not significantly affect farmers' motivation ( $p = 0.678$ ). This finding indicates that extension activities, agricultural information sources, and government support have not been able to significantly increase farmers' motivation. Based on field observations and interviews, most farmers rely more on personal experience and information from fellow farmers than formal extension activities. Extension activities in Besowo Village are not conducted regularly, and the material provided is still general in nature, thus not fully addressing farmers' specific problems such as high production costs and price fluctuations.

Government support has also not been optimally felt because assistance is more short-term oriented, while farmers' main challenges relate to structural aspects such as access to capital and market certainty. According to Alderfer's (1972) ERG Theory, human needs can be influenced by the social environment (*relatedness needs*), but the fulfillment of these needs is not always the dominant factor when basic needs (*existence needs*) have not been fully met. This result is consistent with Tsarwah's (2022) finding that external factors do not always increase farmers' motivation when the benefits are not directly felt.

## 3. Effect of Intrinsic and Extrinsic Factors on Farming Development

Intrinsic factors ( $p = 0.729$ ), extrinsic factors ( $p = 0.359$ ), and farmers' motivation ( $p = 0.163$ ) did not significantly affect shallow farming development. These findings indicate that farmers' internal characteristics, external support, and motivation are insufficient to encourage farmers to improve productivity, intensify farming, or expand production scale.

Based on interviews with respondents, farmers' decisions to develop farming are more influenced by economic considerations such as financial capacity, profit prospects, and business risk. Farmers in Besowo Village still face various constraints, including high production costs, price fluctuations, climate change, and pest attacks. Consequently, farmers tend to adopt risk-avoidance strategies by maintaining existing farming scales rather than expanding. From the perspective of ERG Theory, the dominance of *existence needs* over *growth needs* explain why farmers focus more on maintaining farming sustainability rather than developing their operations.

## 4. Mediating Role of Farmers' Motivation

The specific indirect effect testing results showed that farmers' motivation failed to mediate the effects of intrinsic factors ( $p = 0.186$ ) and extrinsic factors ( $p = 0.770$ ) on farming development. This finding provides an important novelty contribution to the study of farmer behavior and farming development. Unlike theoretical assumptions that consider motivation as the primary mechanism linking farmer characteristics with business development behavior, this study proves

that motivation is not an effective mediator in the context of shallot farming.

Motivation is a *necessary condition* but not a *sufficient condition* for farming development. Farmers may have high motivation but will not automatically translate into development actions without a conducive business environment. This finding reinforces the understanding that shallot farming development is a multidimensional phenomenon influenced by various factors beyond the research model, including access to financing, price stability, production costs, technological innovation adoption, climate change, farmer institutional strengthening, and government policies. The low  $R^2$  value (0.100) on the farming development variable indicates that about 90% of the variation in farming development is explained by other factors not yet included in the model, opening opportunities for future research to develop more comprehensive models.

### **5. Practical Implications**

The findings of this study have several practical implications. First, extension programs should adopt a more participatory and farmer-centered approach with materials covering business risk management, marketing strategies, and digital technology utilization. Second, government policies should prioritize price stabilization, expanded access to financing, strengthening farmer institutions, and provision of affordable production facilities. Third, farmers should continue to enhance their internal capacity through knowledge development, skills improvement, and business management capabilities.

### **Conclusion**

Based on the research findings, the following conclusions can be drawn:

1. Intrinsic factors have a positive and significant effect on farmers' motivation. Among the indicators, land area and education level are the most dominant in forming intrinsic factors. This confirms that farmers' internal characteristics are the primary drivers of motivation in shallot farming.
2. Extrinsic factors do not significantly affect farmers' motivation. Extension activities, agricultural information sources, and government support have not been able to significantly increase farmers' motivation, indicating that motivation is more influenced by internal drives than environmental factors.
3. Intrinsic factors, extrinsic factors, and farmers' motivation do not significantly affect shallot farming development. Farming development is influenced by various other factors outside the research model, including access to financing, price fluctuations, production costs, climate change, pest attacks, market access, and government policies.
4. Farmers' motivation does not mediate the effects of intrinsic factors nor extrinsic factors on shallot farming development.

Although intrinsic factors increase farmers' motivation, this increased motivation has not been translated into tangible farming development.

5. Overall, shallot farming development is a complex phenomenon influenced by various interrelated factors. The  $R^2$  value of 0.451 for motivation indicates that intrinsic and extrinsic factors explain 45.1% of the variation in motivation, while the  $R^2$  value of 0.100 for farming development indicates that the model explains only 10.0% of the variation, with 90.0% explained by other factors outside the model.

### **Recommendations**

Based on the conclusions above, several strategic recommendations are proposed to support the digital transformation of urban agriculture:

1. For Farmers: Shallot farmers in Besowo Village should continue to enhance their capacity and competence through knowledge development, skills improvement, and adoption of cultivation innovations appropriate to local conditions. Farmers should also improve their ability to manage business risks through income diversification, production cost planning, and utilization of efficient cultivation technologies.
2. For Government and Extension Workers: The government and agricultural extension workers should improve the quality of farmer assistance programs through extension that is more oriented to farmers' real needs. Extension materials should not only focus on technical aspects but also cover business management, risk management, marketing strategies, financial literacy, and digital technology utilization. Additionally, policies supporting shallot farming development should be strengthened through improved access to financing, price stabilization, provision of affordable production facilities, and strengthening farmer institutions.
3. For Future Researchers: Future research should develop more comprehensive models by adding other variables that may influence shallot farming development, including access to financing, entrepreneurial orientation, risk perception, social capital, farmer institutions, market access, technological innovation adoption, and government policies. Mixed-methods or longitudinal approaches are also recommended to explain changes in motivation and farming development over longer periods.

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