The Drive Behind Clove Farmers: Sustaining Clove Farming in Ngiliran Village, Panekan District, Magetan

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Abstract. Clove is a high-potential plantation commodity widely demanded by European countries as a spice. Most residents of Ngiliran Village, Panekan Subdistrict, Magetan Regency, have been cultivating cloves since 1970. However, clove prices have continuously fluctuated, necessitating research into farmers' motivation to maintain clove farming. This study aims to analyze the drive that makes farmers continue to do clove farming in Ngiliran Village. 35 active clove farmers were randomly interviewed. The research method employed was descriptive with a quantitative approach. Data analysis techniques included the Rank Spearman correlation analysis. The analysis results indicate that farmers' motivation to maintain clove farming is to meet physiological needs such as clothing, food, shelter, investment, and savings for old age. The Rank Spearman correlation analysis shows that internal factors, including primary occupation, secondary occupation, income, and number of family dependents, have a significant relationship with physiological needs. Additionally, the external factor of marketing significantly correlates with farmers' physiological needs.

1 Introduction

Indonesia is one of the agrarian countries where the agricultural sector is a vital component [1,2]. The agricultural sector in Indonesia holds significant potential for development due to the country's tropical climate, which provides ample sunlight and rainfall conducive to plant growth, and fertile soil that supports various types of plants [3]. Indonesia can produce a wide range of agricultural commodities, from staple foods to supplementary foodstuffs [4–6]. And the agricultural product which has good contribution to local and national economy need to be supported [7,8].

Agriculture is an activity that utilizes natural resources conducted by humans to obtain food, industrial raw materials, energy sources, and to manage the environment [9]. The clove commodity (*Szygyium aromaticum L.*) is a plantation product that significantly contributes to the national economy, from small industries to large factories [10]. Cloves

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are essential as raw materials in the production of cigarettes, cosmetics, perfumes, and fragrances [11].

Cloves are a high-value commodity in high demand by European countries [10]. Initially, cloves were an export commodity, but since the 19th century, they have been primarily for domestic use due to the growing kretek cigarette industry in Indonesia [12]. Therefore, cloves are a plantation commodity with excellent development prospects. Their high price can increase farmers' income [13]. However, the issue of price fluctuations has emerged, affecting clove sales [14,15]. During peak harvest seasons, clove prices tend to drop, disadvantaging farmers and impacting their interest in maintaining and harvesting cloves. This trend is the same with the other agricultural products, where the product price will decrese due to the abundance of harvested products. Cloves are a promising plantation commodity, but in the past 30 years, their price has fluctuated.

Additionally, the price problem makes farmers think twice about continuing their clove farming. Farmers in Ngiliran Village reported that the dry clove price, which used to reach IDR 150,000 per kilogram, has dropped to IDR 90,000, and in the 1990s, it plummeted to IDR 500 per kilogram. Due to these fluctuations, many farmers have cut down productive clove trees, replacing them with fruit crops. Clove cultivation also faces problems such as pests and diseases attack. This situation has prompted this study to investigate the motivation of farmers to maintain clove farming and the factors that motivate them to continue cultivating cloves.

2 Research Method

The primary methodology used for this research is descriptive with a quantitative approach. The research location was deliberately chosen using purposive sampling, with the sample taken in Ngiliran Village, Panekan Subdistrict, Magetan Regency, East Java. This location was selected because it is one of the clove-producing areas in Panekan Subdistrict, Magetan Regency.

The sampling in this study involved selecting farmers who have farmland or fields planted with cloves. A sample of 35 farmers was taken from a population of 100 using the simple random sampling method. This method provides an equal opportunity for each farmer to be selected as a sample member by conducting a simple lottery. The names of 100 farmers were written on paper, folded, and then drawn randomly until 35 samples were collected.

The data used in this study include primary and secondary data. Primary data were obtained directly from respondents through interviews and observations using a questionnaire [16]. This included farmer identity, internal factors, external factors, and farming practices in clove cultivation. Farmer identity data consisted of name, gender, and address of the respondents. Internal factor data included age, education, primary and secondary occupations, farming experience, land area, income, and number of family dependents. Motivation data were categorized into five variables: physiological needs, safety needs, social needs, social status, and self-actualization needs, each with three indicators. The data collection was conducted in 2022.

Secondary data were obtained indirectly through intermediaries, including village monographs and profiles from the Ngiliran Village Head office, clove production data from Panekan Subdistrict from the Magetan Regency BPS, and other secondary data from various books, research journals, websites, articles, and previous studies relevant to the theory used.

Once all data were collected from interviews with respondents, the questionnaire results were tabulated using Microsoft Excel. Based on the research objectives, the following analysis techniques were used. The theoretical approach applied is Maslow's Motivation

Theory, which includes physiological needs, safety needs, love and belonging needs, esteem needs, and self-actualization needs [17]. Clove farmers' motivation was analyzed using a scoring system, where scores are categorized as follows: 1 for strongly disagree, 2 for disagree, 3 for neutral, 4 for agree, and 5 for strongly agree. The total motivation score is categorized into Very Low, Low, Moderate, High, and Very High (Tables 1 and 2). Factors influencing motivation were also analyzed using the Spearman Rank correlation (Table 3).

Table 1. Level of Motivation Category for Each Variable

Motivation	Score Range	Category				
		Very Low	Low	Moderate	High	Very High
Physiological	3.0-15.4	3.0-5.4	5.5-7.9	8.0-10.4	10.5-12.9	13.0-15.4
Safety	3.0-15.4	3.0-5.4	5.5-7.9	8.0-10.4	10.5-12.9	13.0-15.4
Love and belonging	3.0-15.4	3.0-5.4	5.5-7.9	8.0-10.4	10.5-12.9	13.0-15.4
Esteem	2.0-11.3	2.0-3.6	3.7-5.3	5.4-7	8-9.6	9.7-11.3
Self-Actualization	2.0-11.3	2.0-3.6	3.7-5.3	5.4-7	8-9.6	9.7-11.3

Table 2. Category for Total Score of Motivation

Score	Category
13-23.4	Very Low
23.5-33.9	Low
34-44.4	Moderate
44.5-54.9	High
55-65.4	Very High

Table 3. Rank Spearman Correlation Interpretation

Correlation Coefficient Interval	Interpretation
0.00-0.199	Very Low
0.200-0.399	Low
0.400-0.599	Neutral
0.600-0.799	High
0.800-1.00	Very High

3 Results and Discussion

3.1 Farmers' Characteristic

Clove farming activities conducted by farmers include planting, maintenance, harvesting, and post-harvest activities on their own land [18]. Farmers do not engage in seedling activities; instead, they prefer to purchase ready-to-plant seedlings. The seedlings are sourced from Trenggalek and Magelang, although some farmers buy seedlings from itinerant seed sellers or nearby seed stores.

The type of seedlings used by clove farmers is predominantly Zanzibar clove. However, not all farmers use Zanzibar seedlings; some choose seedlings based on their experience by selecting seedlings based on their physical characteristics. Farmers report that good quality seedlings have round-shaped leaves, which they believe will produce large clove flowers. The fruiting time of clove trees depends on the size of the seedlings used; smaller seedlings

require 5-6 years to bear fruit, while larger seedlings (over one meter) take approximately 1-2 years to bear fruit.

Among the 35 respondent farmers, 22 have between 2-33 clove trees. The number of trees owned by farmers depends on the land area used for clove farming. The harvest yield is influenced by the number of productive trees. Only 8 farmers reported harvest yields of 234-350 kg of fresh cloves. The distance between farmers' homes and their clove fields ranges from 1-3 km. The clove sales locations are also within the surrounding area. The supported environment will make farmers to continue their clove farming [19].

3.2 Farmers' Motivation to Keep the Clove Plantation

Based on Table 4, it can be observed that the motivation of farmers to maintain clove farming, as seen from the perspective of physiological needs and safety needs, achieved a total score of 12.31, categorized as high. The motivation for social needs also falls into the high category with a total score of 11.77. The need for social status is categorized as very low with a total score of 2.57. The need for self-actualization is categorized as low with a total score of 6.67. Overall Maslow's hierarchy of needs motivation for farmers in maintaining clove farming achieved a total score of 45.63, which is categorized as high. Based on these results, it can be concluded that among the five need indicators, the primary motivation for farmers to maintain clove farming is to meet their primary needs, which are included in physiological needs encompassing clothing, food, and shelter, and subsequently to meet other needs [17,20–22].

Table 4. Farmers' Motivation

Indicator	Score	Category
Physiological	12.31	High
Safety	12.31	High
Love and belonging	11.77	High
Esteem	2.57	Very Low
Self-Actualization	6.67	Moderate
Total	45.63	High

3.3 Factors Related to Farmer Motivation

Overall, age, education, farming experience, and land area do not significantly influence the motivation for physiological needs, safety needs, social needs, social status, or self-actualization. Age has a negative correlation with safety needs and social needs. Clove farmers in Ngiliran Village do not consider age as a benchmark for managing their clove farming. There is a significant relationship between the internal factor of primary occupation and the motivation for physiological needs ($0.007 < 0.01$) with a 99% confidence level. If the primary occupation provides high income, physiological needs can be easily met. There is also a significant relationship between the internal factor of secondary occupation and the motivation for physiological needs ($0.001 < 0.01$) with a 99% confidence level. Field research indicates that if income from the primary occupation is insufficient to meet daily needs, farmers will seek secondary jobs to supplement their income. Additionally, there is a significant relationship between the internal factor of income and the motivation for physiological needs ($0.036 < 0.05$). According to the research findings, farmers report that their income is sufficient to meet daily needs, with income derived from both their primary and secondary occupations. The spirit of enterprising agricultural products may vary among farmers [20,23].

Table 5. Factors Affecting Farmers' Motivation in Maintaining Clove Farming Activities

Factor		Physiological	Safety	Love and belonging	Esteem	Self-Actualization
Age	Rs	0.112	-0.090	-0.017	0.074	0.181
	Sig	0.521	0.607	0.922	0.672	0.297
Education	Rs	-0.196	-0.034	0.112	0.244	0.232
	Sig	0.260	0.844	0.523	0.157	0.180
Farming Experience	Rs	0.162	-0.062	-0.038	0.142	0.036
	Sig	0.354	0.723	0.827	0.417	0.835
Land Size	Rs	0.021	0.131	0.153	0.065	0.243
	Sig	0.904	0.453	0.380	0.711	0.160
Income	Rs	-0.356*	-0,006	-0.052	0,070	0.116
	Sig	0,036	0,971	0.766	0.690	0.507
Family Size	Rs	0.411*	0.167	0.269	-0.018	0.024
	Sig	0.014	0.339	0.119	0.918	0.890

**Significant at level 1% * Significant at level 5%

4 Conclusion

The motivation of farmers to maintain clove farming, viewed from the perspective of physiological and safety needs, achieved an average score of 12.31, categorized as high. The motivation for social needs also falls into the high category, with an average score of 11.77. The motivation for social status needs received a very low average score of 2.57, while the motivation for self-actualization needs scored an average of 6.67, which is considered moderate. Internal and external factors associated with the motivation of clove farmers include primary occupation, secondary occupation, income, number of family dependents, and marketing factors. The significant relationship between these internal and external factors and the motivation needs of farmers suggests that the reason farmers continue to maintain clove farming is to supplement their livelihood needs through their ongoing agricultural activities. It is expected that clove farmers will provide optimal care for their clove farming to maximize the yields obtained. Additionally, government support is crucial to ensure that farmers remain motivated to sustain their clove farming operations.

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