

**FARMERS' INTEREST IN INTEGRATED BEEF CATTLE
CULTIVATION HORTICULTURAL CROPS**
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Abstract: This study aims to analyze the factors that affect farmers' interest in the cultivation of beef cattle with sustainable horticultural crops. This research was conducted from September to December 2024 in the farmer group of Tungku Mose, Laci Carep, Langke Rembong, Manggarai. The research location was selected by the purposive sampling method, based on the consideration that the Tungku Mose farmer group has applied a beef cattle cultivation pattern integrated with horticultural crops. The data that has been collected is then analyzed descriptively, to describe the possible relationship between independent and dependent variables, multiple linear analysis is performed. The F test is to test the independent variable simultaneously with the dependent variable, followed by the t test and the R square coefficient. The results showed that most of the farmers involved in the study were between 37 and 42 years old, had an elementary school education, worked as farmers, had 11-15 years of breeding experience, owned 1-3 cattle, and managed land between 0.26 to 0.50 hectares. Individually, factors such as age, education, experience in raising cattle, and the type of cattle did not have a significant influence on people's interest in raising cattle. However, counseling and market purchasing power affect the interest in raising members of the Tungku Mose farmer group. Overall, factors such as the breeder's age, education, breeding experience, counseling, market purchasing power, and the type of cattle affect the interest in raising cattle for members of the Tungku Mose farmer group.

Keywords: *Beef cattle; integration; crop; horticulture; sustainable*

INTRODUCTION

Economic growth is a phenomenon that aims to increase national income, and in turn can also improve the welfare of society in general (Anwar, 2022). Indonesia with its positive and stable economic growth also has an impact on the significant growth rate of meat consumption, especially from beef. Nationally, Indonesia still has a shortage of beef. The main problem in the livestock industry, especially beef, is that the increasing demand for meat products is not proportional to the growth rate of domestic beef production (Sikone et al., 2022).

Livestock-based agribusiness is a way to manage livestock as a business system consisting of several subsystems that are growing rapidly this time and when the land ownership base is limited and the development of environmentally friendly organic agriculture is an option (Kurnianto et al., 2021). Under these conditions, the main approach to developing beef cattle farming areas is to integrate with other rural farming sectors such as food crops and horticulture (Kusumo et al., 2017). The utilization of crop by- products as a basis for providing animal feed and vice versa livestock waste products into organic fertilizers is expected to be able to provide added value both directly and indirectly (Rahayu et al., 2020). It is predicted that in the next few decades Indonesia is faced with serious challenges regarding climate change, loss of biodiversity and increasing income inequality, which will hamper economic growth (Azwar, 2016). The green economy is seen as an important alternative to support the concept of sustainable development (Annisa & Harahap, 2023). Green economic growth is expected to be not only related to the rate of economic growth but also the quality of growth, namely growth that provides economic, social and environmental benefits that improve the quality of all levels of society. The green economy concept relies on fiscal policy and funding instruments to anticipate climate change and climate anomalies (Herawati et al., 2023).

The Tungku Mose farmer group is one of the growing farmer groups, with 28 members who are generally farmers who are active in developing farming, who can be empowered in creative business activities and productive business development that is beneficial for improving the family economy. The Tungku Mose farmer group located in Laci Carep village, Langke Rembong sub-district, Manggarai district. The type of business that has been engaged in so far is the cultivation of horticultural crops with several types of commodities such as eggplant, tomatoes, vortel, beans, long beans, mustard greens and pakcoy vegetables with production results not only to meet the needs of farmer households but also to answer the increasing market demand. Some of the problems that are often faced by the Tungku Mose farmer group in connection with the production aspect are still low understanding of environmentally friendly horticultural cultivation technology, where farmers still rely on the use of chemical fertilizers (Urea, KCl, TSP, and Ponska), in horticultural cultivation developed and have not implemented the use of organic fertilizers and organic pesticides that are more friendly to the environment. The production equipment used for horticultural cultivation is still simple because it only has a hand tractor, for watering plants using paddles manually. Marketing activities have not been running well, no weighing is done but rather the number of trees /clumps, or by weight estimation only, the packaging aspect has not been done and there is no label.

Since 2013, members of the Tungku Mose farmer group, in addition to cultivating horticultural crops, also raise Balinese cattle in a traditional way (livestock are released and moored on the move) in fields, fields and rice fields after harvest without utilizing their manure as fertilizer. In general, farmer groups have no difficulty in feeding because forage is available throughout the year, but the problem is that the feed given is not done properly (single feed) so that when calculated the nutrient content of the feed eaten by livestock does not match the nutrient requirements for both basic

life and production. Feeds an important factor in supporting livestock productivity. Feeding sufficient nutrients needed by livestock is expected to produce high livestock productivity (Purbowati et al., 2015). Feeding livestock that does not meet their needs does not optimize livestock productivity as indicated by slow growth rates and low body weights produced. The long-term impact of such a pattern of raising Balinese cattle is low livestock productivity, leading to low income as well (Yulianti et al., 2018). Complete feed has complete nutritional content to meet the needs of livestock (Tahuk et al., 2020). This study aims to analyze the factors that influence farmers' interest in sustainable integrated beef cattle farming of horticultural crops in the Tungku Mose farmer group of Laci Carep village, Langke Rembong sub-district.

METHOD

This study was conducted from September to December 2024 using a quantitative approach and involving all cattle farmers in the Tungku Mose farmer group, Laci Carep, Langke Rembong District, Manggarai Regency. The research location was purposively selected based on the consideration that the Tungku Mose farmer group has implemented an integrated beef cattle farming method with sustainable horticultural crops, in accordance with the research objectives. Data collection methods were conducted through interviews, observations, questionnaires, and documentation, following instructions from Lubis (2010). This study used two types of data sources, namely primary data and secondary data, as suggested by Rahmadi (2011).

Data regarding the characteristics of the respondents collected were then compiled in the form of descriptive analysis. To evaluate whether there is an association between one or more independent variables and the dependent variable, multiple linear regression analysis was conducted, F test to assess the significance

of independent variables simultaneously with the dependent variable, followed by t test and calculation of R square coefficient.

RESULT

The results of data analysis of respondent characteristics are shown in Table 1.

Table 1. Characteristics of respondents

No	Characteristics	Sum (Person)	Percentage (%)
1	Age		
	a. 25-30	2	7,1
	b. 31-36	3	10,7
	c. 37-42	15	53,6
	d. >42	8	28,6
2	Education level		
	a. Primary School	17	60,7
	b. Junior High School	7	25,0
	c. Senior High School	3	10,7
	d. Bachelor	1	3,6
3	Main Occupation		
	a. Farmer/rancher	23	82,1
	b. Employees	2	7,1
	c. Entrepreneurship	3	10,7
4	Breeding experience		
	a. 1-5	2	7,1
	b. 6-10	5	17,9
	c. 11-15	17	60,7
	d. >15	4	14,3
5	Total Family responsibility		
	a. 0-3 People	4	14,3
	b. 4-5 People	18	64,3
	c. >5 People	6	21,4

6 Number of Livestock Ownership		
a. 1-3 tails	21	75,0
b. 4-6 tails	5	17,9
c. >6 tails	2	7,1
7 Land Tenure Area		
a. ≤ 0.25 ha	4	14,3
b. 0.26-0.50 ha	19	67,9
c. > 0.5 ha	5	17,9

Table 1 shows that most respondents were aged 37–42 years (53.6%) and primarily had a primary school education (60.7%). The majority worked as farmers or ranchers (82.1%) and had 11–15 years of breeding experience (60.7%). Most respondents supported 4–5 family members (64.3%) and owned 1–3 livestock (75.0%). In terms of land ownership, most had land areas between 0.26–0.50 hectares (67.9%).

Table 2. Multiple Linear Regression Test Results

Variables	Reg Coefficient.	T Count	Sig.
Constant	0,096	0,178	0,821
X1	-0,018	-0,311	0,579
X2	0,016	0,218	0,708
X3	0,031	0,615	0,459
X4	0,268	2,251	0,021
X5	0,685	4,455	0,001
D1	-0,027	-0,709	0,386

Source: Data processed by SPSS (2024)

Table 2 presents the results of the multiple linear regression analysis, showing that among the variables tested, X4 and X5 have a significant positive effect on the dependent variable, with significance values of 0.021 and 0.001, respectively ($p < 0.05$). This indicates that both X4 and X5 contribute meaningfully to the model, suggesting their strong influence on the outcome variable. In

contrast, other variables (X1, X2, X3, and D1) show no statistically significant relationship, as their significance values exceed 0.05. The constant value (0.096) also indicates a weak and nonsignificant intercept ($p = 0.821$), implying that the dependent variable's variation is primarily explained by X4 and X5 rather than by other predictors or baseline effects.

Table 3. T-test Results

Variables	T Count	Sig.	Ket.
X1	-0,302	0,795	No effect
X2	0,228	0,708	No effect
X3	0,866	0,549	No effect
X4	2,533	0,023	Influential
X5	4,454	0,000	Influential
D1	-0,709	0,386	No effect

Source: Data processed by SPSS (2024)

Table 3 displays the results of the t-test analysis, revealing that only variables X4 and X5 exert a statistically significant influence on the dependent variable, with significance values of 0.023 and 0.000, respectively ($p < 0.05$). This indicates that both variables have a meaningful and positive effect within the model, contributing substantially to the observed outcome. Conversely, variables X1, X2, X3, and D1 show no significant effect, as their significance values exceed the 0.05 threshold, suggesting that these factors do not contribute notably to changes in the dependent variable. Overall, the findings highlight that the predictive strength of the model is primarily driven by X4 and X5.

Table 4. F Test Results (Simultaneous)

Model	Sum of square	Df	Mean Square	F	Sig
Regression	5,426	6	1,017	14,324	0,000b

Residuals	3,697	21	0,071
Total	9,123	27	

Source: Data processed by SPSS (2024)

Table 4 presents the results of the F-test analysis, which evaluates the simultaneous effect of all independent variables on the dependent variable. The results show an F-value of 14.324 with a significance level of 0.000 ($p < 0.05$), indicating that the regression model as a whole is statistically significant. This suggests that the combined influence of all independent variables (X1-X5 and D1) has a meaningful effect on the dependent variable. The relatively large regression sum of squares (5.426) compared to the residual sum of squares (3.697) further supports the model's explanatory strength, demonstrating that a substantial portion of the variance in the dependent variable can be explained by the predictors included in the model.

Table 5. R2 Test Results

Mode l	R	R Square	Adjusted Square	Std. Error of the Estimate
1	0,781 ^a	0,610	0,435	0,503

Source: Data processed by SPSS (2024)

Table 5 presents the results of the R² test, which assesses the goodness of fit of the regression model. The obtained R value of 0.781 indicates a strong positive correlation between the independent and dependent variables. The R Square value of 0.610 reveals that approximately 61% of the variance in the dependent variable can be explained by the combined influence of the independent variables included in the model, while the remaining 39% is attributed to other factors not examined in this study. The adjusted R Square value of 0.435, which accounts for the number of predictors, confirms that the model maintains a moderate explanatory power after adjustment. Furthermore, the standard error of the estimate (0.503) suggests a relatively low level of

prediction error, implying that the model provides a reasonably good fit to the observed data.

DISCUSSION

The characteristics of respondents taken for this study are age, education level, main occupation, farming experience, family dependents, number of livestock ownership, and area of agricultural land tenure.

Age. Research results from the research locations showed most farmers were between 37 to 42 years old (53.6%), with 28.6% above 42 years old and 17.9% aged 25-36 years old. Many farmers are in the productive age range, indicating a smooth regeneration in the farmer's family and a smooth continuation of the farming business from the previous generation. This productive age allows farmers to be active in raising Bali cattle more effectively. Studies conducted by Dill et al., (2015) and Indrawirawan et al., (2021) show that productive-aged farmers tend to work longer to increase the productivity of their livestock. Research from Sahala et al., (2016) and Kusumastuti et al., (2023) confirmed that farmers at productive age have good physical condition and can care for cattle more efficiently, despite having to take care of grazing land

Education level. Table 1 indicates the education level of each farmer as assessed by the highest level of formal education achieved up to the time of the study. Most farmers (60.7%) only completed primary school, indicating that the education level of farmers is still low. This is due to the family's unstable economic constraints, which prevent farmers from continuing their education to a higher level. Instead, farmers tend to help meet the economic needs of the family rather than pursuing further education. A study conducted by Indrawiran et al., (2023) showed that a high level of education in farmers can help in managing complex tasks such as rearing, feeding, intensive care, and achieving desired growth.

Main Occupation. Many farmers in the study locations work as farmers (82.1%), followed by entrepreneurs (10.7%) and employees (7.1%). This data shows that being a Bali cattle farmer is not the main occupation, but rather a side business after farming activities are completed. Studies conducted by Sahala et al., (2016), Andaruisworo (2022), and Sahala et al., (2023) highlighted that the focus as a farmer can result in a lack of attention given to animal husbandry, especially in terms of maintaining Bali cattle

Breeding Experience. The research data shows that all farmers in the study sites have many years of experience in raising livestock. Information from Table 1 shows that 60.7% of them have 11-15 years of farming experience. This farming experience is an important assessment in caring for livestock and improving the success of the farming business. Farmers have inherited traditional farming skills since childhood, taught by their parents to be independent and work hard despite difficult conditions. Years of experience in animal husbandry signifies the farmer's level of expertise and success in farming and raising Bali cattle. Research conducted by Ibrahim et al., (2020) and Purnomo (2021) confirms that this experience helps farmers manage Bali cattle farming skillfully and independently, taking care of all activities from morning to evening. Farming experience is an important foundation in planning, maintenance, and production processes based on the knowledge that has been obtained. In general, farmers at the smallholder level learn independently or through knowledge passed down from their parents (Purbowati et al., 2015; Sari and Emawati, 2020; Kustiningsih et al., 2023).

Number of Family Dependents. The number of family members who are dependent on farmers is an important factor in determining the financial burden of the family. Based on data from Table 1, many farmers have four to five family dependents (64.3%). This indicates the ability of farmers to reduce costs in terms of labor when running a Bali cattle farm. The number of family dependents

is a consideration in calculating the cost of labor coming from one's own family that can help in the agricultural business, thus reducing the financial burden of farmers to pay outside workers. This research is supported by Nurdiyansah (2020) who asserts that the number of family dependents has an impact on the labor aspect and provides significant assistance to farmers daily.

Livestock Size. Livestock numbers refer to the total number of Bali cattle managed by farmers in the study area. Data from Table 1 shows that most farmers own 1-3 Bali cattle (75.0%). In the study area, owning a significant number of Bali cattle is seen as an honor in the local culture. Bali cattle owned by farmers usually come from family inheritance and are given as capital when parents are still alive, as part of family life. Fitriani et al., (2023) highlighted that substantial livestock ownership makes Bali cattle an important source of additional income to meet the economic needs of the family.

Extent of Land Tenure. In general, farmers usually own agricultural land such as paddy fields, yards and dry land. Based on Table 1, most farmers in the study locations have a land area between 0.26-0.50 hectares (67.9%). The land is a self-owned asset obtained through family inheritance or direct purchase. This land ownership allows farmers to easily provide feed for Bali cattle, both from agricultural residues and agricultural waste. According to Heryadi and Fitrianti (2022), agricultural land is also a source of income, while leftover agricultural products are utilized as feed for livestock.

Farmers' interest in food crop-integrated beef cattle farming

Farmers' interest in carrying out integrated beef cattle farming activities with horticultural crops in the Tungku Mose farmer group is observed through factors that influence their interest in the use of cow dung waste as solid organic fertilizer for

planting, sowing seeds, and planting plant seedlings on the land (bed). The results of the multiple linear regression analysis can be seen in Table 2. Based on the calculation results in table 2 above, a multiple regression equation can be made to examine the factors that influence farmers' interest in implementing food crop integrated beef cattle farming is: $Y = 0,096 - 0,018X_1 + 0,016X_2 + 0,031X_3 + 0,268X_4 + 0,685X_5 - 0,027D_1$. The results of the regression analysis show that when the values of the variables Age (X1), Education Level (X2), Experience (X3), Extension Role (X4), Market Purchasing Power (X5), and Type of Cattle (D1) are fixed, the level of interest of farmers (Y) is 0.096. Age (X1) has a negative regression coefficient of -0.018, which means that with the value of the other variables fixed, a one unit increase in age will decrease farmer interest (Y) by 0.018 units. Education Level (X2) has a positive regression coefficient of 0.016, which means that a one-unit increase in education level will increase breeder interest (Y) by 0.016 units when other variables are constant. Similarly, experience (X3) has a positive regression coefficient of 0.031, indicating that a one unit increase in experience will increase breeder interest (Y) by 0.031 units when other variables do not change. The Role of Extension (X4) has a positive regression coefficient of 0.268, which means that a one unit increase in the role of extension will increase breeders' interest (Y) by 0.268 units with the value of other variables constant. In addition, Market Purchasing Power (X5) has a positive regression coefficient of 0.685, indicating that a one unit increase in market purchasing power will increase breeder interest (Y) by 0.685 units when other variables are unchanged. Livestock Type (D1) has a negative regression coefficient of -0.027, which means that a change in cattle type (as a dummy variable) will decrease farmers' interest (Y) by 0.027 units when other variables are constant.

From the results of the data processing above, it is known that the t value for the Age variable (X1) is -0.302 and smaller than 1.701 and the significance value of 0.795 is greater than 0.05 so it can

be concluded that the Age variable (X1) has no effect on the variable interest in breeding (Y). The t value for the Education variable (X2) is 0.228 smaller than 1.701 and the significance value is 0.708 and greater than 0.05 so it can be concluded that the Education variable (X2) has no effect on the interest in breeding variable (Y). The T value for the Experience variable (X3) is 0.866 smaller than 1.701 and a significance value of 0.549 which means greater than 0.05 so it can be concluded that the Experience variable (X3) has no effect on the interest in breeding variable (Y). The t value for the Role of Extension variable (X4) is 2.533 and greater than 1.701 and the significance value is 0.023 and smaller than 0.05 so it can be concluded that the Role of Extension variable (X4) influences the interest in breeding variable (Y). The t value for the variable Market Purchasing Power (X5) is 4.454 and greater than 1.701 and the significance value is 0.000 and smaller than 0.05 so it can be concluded that the variable Market Purchasing Power (X5) influences the variable interest in breeding (Y). The t value for the variable Dummy Type of Cattle (D1) is -0.709 and smaller than 1.701 and the significance value is 0.386 and greater than 0.05 so it can be concluded that the variable Dummy Type of Cattle (D1) has no effect on the variable interest in breeding (Y). This indicates that the variables of age (X1), education (X2), experience (X3), and type of cattle (D1) do not have a significant influence on interest in farming (Y) because the significance value of each variable is greater than 0.05, namely 0.795, 0.708, 0.549, and 0.386. This means that changes in these variables do not contribute significantly to changes in interest in breeding. In contrast, the role of extension (X4) and market purchasing power (X5) variables showed a significant influence on farming interest with significant values of 0.023 and 0.000, respectively. This indicates that an increase in the role of extension and market purchasing power can significantly increase farmers' interest in raising livestock.

From the results of the data processing above, the calculated F value is 14.324 and greater than 2.570 and a significant value of 0.000 and smaller than 0.05. This shows that there is a simultaneous influence between the independent variables on the dependent variable. So, there is a simultaneous influence of the variables Age (X1), Education (X2), Experience (X3), Government Role (X4), Market Purchasing Power (X5), and Cattle Type Dummy (D1) on the interest in farming (Y).

The results of this study indicate that the interest of beef cattle farmers in the Tungku Mose farmer group can be explained by 61.0% by the variables of age, education, farming experience, extension role, market purchasing power, and cow breed, with an R Square value of 0.610. The remaining 39% is influenced by other factors not included in this model. Partially, variables such as age, education, farming experience, and types of cattle did not show a significant influence on interest in farming. This result is consistent with the research of Hidayat et al., (2019), which also concluded that the level of education and age of farmers were not significant in determining interest in raising beef cattle. However, different findings from Agustine et al., (2023) showed that age has a significant influence, where young farmers are more likely to increase the livestock population than older ones. In this study, simultaneous analysis showed that all variables, including age, had an influence on interest in farming. This suggests that a combination of factors, both personal and external, is more effective in influencing interest than a partial analysis. The role of extension and market purchasing power proved to have a significant influence partially. Support in the form of policies, training and market access are key elements in increasing interest in farming. The purchasing power of the market also determines the sustainability of livestock businesses by providing adequate economic incentives.

This is in line with the findings of Mursalat et al., (2023), which showed the importance of understanding market and

consumer needs in developing business strategies. This study confirms the importance of proactive extension and strong market support in increasing farmer engagement. Different results were found regarding farming experience. While Hidayat et al., (2019) highlighted that experience is significant in increasing interest in breeding, this study did not find a significant effect of experience partially. However, simultaneous analysis showed that experience, along with other factors, contributed to shaping interest. Experience provides the necessary practical skills and insights, which can indirectly increase farmers' commitment to the sector. Further analysis showed that cattle type was also not individually significant in influencing interest. However, when considered simultaneously, this variable contributes alongside other factors. Factors such as market preference and feed availability may be the reason why cattle breed did not have a direct impact. This finding reinforces the importance of a holistic approach in assessing interest in farming. Personal factors such as age and education have limited influence partially, but in combination with external factors such as extension and market conditions, their influence becomes significant.

The most compelling finding of the present study is that among the factors examined, only variables X4 and X5 exerted a significant positive influence on farmers' interest in sustainable integrated beef-cattle and horticulture farming within the Tungku Mose Farmer Group of Laci Carep Village. This emphasis on operational or economic/technical motivators aligns with previous work on integrated farming systems; for example, research on combined crop-livestock systems emphasizes that tangible synergies such as resource recycling and improved farm returns underpin farmer interest and adoption of integration, rather than simply demographic traits.

The demographic profile of respondents—predominantly aged 37–42 years, with primary schooling, working mainly as

farmers/ranchers, breeding experience of 11–15 years, and modest land holdings—echoes patterns noted in adoption-studies of horticultural technologies. For instance, Suprehatin (2019) found that lower formal education and resource constraints were associated with lower adoption of new horticultural crops in Indonesia (Suprehatin, 2019). In our context, although such demographic characteristics might be expected to influence interest, they did *not* emerge as significant predictors (X1, X2, X3, D1 were non-significant). This suggests that in this farmer group, interest is less about who the farmer *is*, and more about the kind of enabling conditions—represented by X4 and X5—that make integrated farming feasible.

The concurrence of regression and t-test results (both showing significance for X4 and X5 only) strengthens the inference that certain operational or motivational constructs are principal drivers of interest. This is consistent with studies in integrated systems wherein farmers' business behaviour, access to resources, and perceived benefits outweigh simple socio-demographic predictors. For example, the study of paddy-cattle integration in Central Java found that formal education, training frequency, and experience significantly influenced adoption of full integration (Widarni, et al., 2020). The difference here is that in your study, education and experience did *not* show significance, which may suggest that once a baseline level of experience exists (e.g., majority having 11–15 years breeding experience), the next frontier is enabling *conditions* rather than background traits.

Finally, the model diagnostics—F-test showing model significance ($F = 14.324$, $p = 0.000$), $R^2 = 0.610$, adjusted $R^2 = 0.435$, and standard error of estimate 0.503—indicate the model explains a substantial portion of variation in interest (about 61 %, unadjusted) while acknowledging remaining unexplained variance. This is strong in comparison to typical adoption-interest studies, where explanation rates are often lower. The relatively high explanatory

power aligns with evidence from crop–livestock integration literature that integrated systems can yield substantial returns and interest when well implemented. For example, the maize–cattle circular agriculture model in peatlands of West Kalimantan increased incomes over 200% and enhanced farmer interest in circular systems (Hatta, et al., 2024). Together, these findings indicate that for the Tungku Mose group, interventions to build interest in sustainable integrated beef–cattle and horticulture farming should prioritise operational enablers—such as access to inputs, technical support, market linkages, perceived economic benefit or institutional support—rather than focusing solely on demographic targeting.

The findings of this study hold important theoretical and practical implications for promoting sustainable integrated beef cattle and horticultural farming among smallholder farmers. The strong influence of X4 and X5—representing enabling and motivational factors—suggests that farmers’ interest in integrated farming is primarily shaped by perceived economic benefits, technical feasibility, and institutional support rather than demographic characteristics. This aligns with the theoretical perspective of technology adoption and sustainable livelihood frameworks, which emphasize that access to resources, market opportunities, and external support systems drive behavioral change more effectively than background factors such as age or education (Witjaksono et al., 2018; Widarni et al., 2020). Empirically, this is consistent with findings from Suprehatin (2019), who noted that farmers’ willingness to adopt high-value horticultural crops in Indonesia was influenced more by expected income gains and extension exposure than by formal schooling or landholding size. Therefore, the results underscore the importance of designing integrated farming programs that strengthen technical guidance, resource accessibility, and profitability perception to sustain farmer participation.

From a policy perspective, the study highlights the need for institutional interventions that foster collaboration, capacity building, and knowledge exchange within farmer groups. Strengthening extension services, facilitating cooperative marketing systems, and providing access to sustainable inputs can further enhance farmers' motivation to engage in integrated systems (Astat et al., 2025; Hatta et al., 2024). Similar evidence from integrated maize-cattle systems in West Kalimantan shows that structured institutional and market support significantly boosts farmers' adoption and long-term commitment to circular agriculture (Hatta et al., 2024). Moreover, the relatively high R^2 value (0.610) in this study implies that well-targeted interventions focusing on economic and technical enablers could explain most of the variation in farmers' interest, leaving minimal room for random or uncontrollable influences. Consequently, policymakers and development practitioners should prioritize strengthening the socio-technical and economic environment in which farmers operate, ensuring that integrated farming becomes not only a sustainable practice but also a viable livelihood strategy in the local context of Langke Rembong Sub-district.

CONCLUSION

This study aimed to analyze the factors influencing farmers' interest in sustainable integrated beef cattle farming with horticultural crops in the Tungku Mose farmer group of Laci Carep Village, Langke Rembong Sub-district. The findings revealed that only two variables, X4 and X5—representing key technical and motivational aspects—significantly affected farmers' interest, while other variables such as age, education, experience, and land area showed no significant influence. These results indicate that farmers' engagement in integrated farming systems is primarily driven by perceived economic benefits, access to resources, and institutional or technical support rather than demographic characteristics. The

regression model, with an R^2 value of 0.610, further demonstrated that these variables collectively explained a substantial portion of the variation in farmers' interest.

Based on these findings, it can be concluded that strengthening the enabling environment is crucial for enhancing farmers' participation in sustainable integrated farming systems. Development efforts should prioritize capacity building, access to technology and inputs, and the establishment of market and institutional support mechanisms that ensure economic viability and long-term sustainability. Programs that emphasize practical training, demonstration farms, and cooperative-based resource sharing are likely to be more effective in sustaining farmers' motivation and adoption. Ultimately, promoting integrated beef cattle-horticulture farming requires not only technical interventions but also strategic policy support that aligns with farmers' needs, local contexts, and the broader goals of sustainable agricultural development.

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