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Socio-Economic Factors Influencing Forest Community Empowerment in Pacitan Regency

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INDEXING	ABSTRACT
Keywords: Keyword 1; Community empowerment Keyword 2; Social Forestry Keyword 3; Socio-economic factors Keyword 4; Pacitan Regency	This study aims to analyze the socio-economic factors that influence the empowerment of forest communities in Pacitan Regency, East Java. The study used a quantitative approach with an explanatory survey method of 350 respondents from five sub-districts (Donorojo, Pringkuku, Punung, Bandar, and Nawangan) selected through proportionate stratified random sampling. Data were analyzed using multiple linear regression to test the influence of nine independent variables (education level, income level, area of cultivated land, access to capital, business experience, number of dependents, age, access to information and technology, and social and institutional capital) on the empowerment of forest communities. The results showed that simultaneously all variables had a significant effect on the empowerment of forest communities ($F = 78.452$; $p < 0.05$) with an R^2 value of 0.675, which means 67.5% of the variation in empowerment can be explained by the model. Partially, eight variables had a significant effect: education level, income level, area of cultivated land, access to capital, business experience, number of dependents (negative effect), access to information and technology, and social and institutional capital. Only age was not significantly affected. The variables with the strongest partial correlations were access to information and technology ($r=0.624$) and social and institutional capital ($r=0.618$). This study recommends the need for comprehensive empowerment policies that include increased access to education, capital, technology, and strengthening LMDH institutions to sustainably improve the welfare of forest communities.

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INTRODUCTION

Forests are a natural resource that plays a strategic role in national development, not only as an ecological support but also as an economic base for the communities living around them. Indonesia, with a forest area of 125.9 million hectares, or approximately 66% of the total national land area, holds enormous potential for community welfare, particularly for those living near forest areas (Ministry of Environment and Forestry, 2025). However, many forest-dwelling communities in Indonesia are still classified as poor and marginalized, with low levels of well-being. Data from the Central Statistics Agency (BPS) shows that approximately 48.8 million Indonesians live in and around forest areas, and the majority of them still depend on forest products for their livelihoods (BPS).

Pacitan Regency, located in East Java Province, has an area of 1,389.87 km² with forest cover of 59,892.20 hectares or approximately 43.10% of its total area (Pacitan Regency

Forestry Service, 2022). The geographical characteristics of Pacitan Regency, which are dominated by karst hills and the Seribu Mountains, make the forestry sector play a vital role in the lives of local communities. Communities around Pacitan's forests generally depend on agriculture, plantations, and the utilization of forest products, both timber and non-timber. However, the socio-economic conditions of the people in Pacitan Regency still face various complex problems, ranging from low levels of education, limited access to business capital, limited infrastructure, to tenure conflicts over forest land (Wibowo et al., 2025).

Empowering forest communities is a crucial strategy for improving community welfare while preserving forests. The concept of empowerment refers to the process of increasing community capacity and independence so that they can manage their resources optimally and sustainably (Damanik, 2019). In the context of social forestry, forest community empowerment focuses not only on economic aspects but also encompasses social, cultural, political, and environmental dimensions. Forest community empowerment programs in Indonesia have been implemented through various schemes such as Community Forestry (HKm), Village Forestry (HD), Community Plantation Forestry (HTR), and Forestry Partnerships, all of which aim to provide legal access to communities in managing forest areas (Salaka et al., 2020).

The success of forest community empowerment programs is heavily influenced by various socioeconomic factors inherent in the community itself. These socioeconomic factors include education level, livelihood structure, income level, access to capital and credit, technological mastery, local institutions, social capital, and demographic characteristics such as age and number of dependents (Damanik, 2019). Research conducted by (Tov et al., 2020) shows that community education level is positively correlated with the success of community-based forest management. Meanwhile, a study by (Arisanty et al., 2024) found that access to capital and technology is a major limiting factor in the development of productive forest community enterprises.

The socio-economic conditions of forest communities in Pacitan Regency demonstrate complex diversity. On the one hand, some community groups have successfully developed businesses based on non-timber forest products such as forest honey, palm sugar, and bamboo handicrafts, which have high economic value. However, on the other hand, many remain trapped in a cycle of poverty due to limited access to markets, capital, and forest product processing technology. The low level of formal education in the community, with the average person only having an elementary school education, also complicates the adoption of innovation and business diversification (BPS Pacitan Regency, 2021). Furthermore, local institutional factors, such as the Forest Village Community Institution (LMDH), have not yet fully functioned optimally in facilitating community access to existing empowerment programs.

Understanding the socioeconomic factors influencing forest community empowerment in Pacitan Regency is crucial for developing more effective and targeted empowerment strategies and policies. In-depth research on the relationship between community socioeconomic characteristics and the success rate of empowerment will provide theoretical and practical contributions to the development of social forestry science and the formulation of community-based forestry development policies. Therefore, this research is expected to provide comprehensive recommendations for stakeholders in designing more participatory, inclusive, and sustainable forest community empowerment programs in Pacitan Regency in particular, and other regions in Indonesia in general.

LITERATURE REVIEW

Research on community-based forest management has become a focus of attention in various regions in Indonesia. (Fauzi, 2023) This study shows that rural forest communities possess sufficient knowledge and skills in forest management, but still have low attitudes toward forest resource conservation. This study emphasizes the importance of an empowerment model that strengthens resource capital and empowerment actors to increase community empowerment. Meanwhile, (Utomo et al., 2021) analyzed the land potential for community forest development in Gunungkidul Regency and found that land with high potential for community forest development reached 55,627 hectares, mainly from shrubland, fields, and mixed plantations. In addition, Nugroho (2022) examined the effectiveness of forest management institutions in the social forestry program and found that from an ecological aspect, the program was quite effective, with changes in the behavior of permit holders becoming more concerned about the forest. Similar research was conducted by (Waskitho, 2022) This study analyzes community empowerment in forest conservation through agroforestry systems. The results indicate that tenure conflicts, inequitable distribution of forest benefits, and low community participation in decision-making are the main obstacles to community empowerment programs. Overall, this literature demonstrates that community empowerment in forest management requires a holistic approach that encompasses social, economic, and ecological aspects.

RESEARCH METHOD

This study uses a quantitative approach with a survey method to explain the causal relationship between socioeconomic factors (independent variables) and forest community empowerment (dependent variables). The study was conducted in Pacitan Regency, East Java Province, specifically in five sub-districts (Donorojo, Pringkuku, Punung, Bandar, and Nawangan) which have extensive forest areas and community empowerment programs of at least three years. The location selection was carried out purposely because Pacitan Regency has a forest area of 59,892.20 hectares (43.10% of the total area) with various social forestry schemes (HKm, HD, and Forestry Partnership). The study was conducted for two months, from July to August 2025.

The study population was 1,500 heads of families from the forest community empowerment program. Using the Slovin formula with a 5% error rate, the sample was determined to be 350 respondents selected through a proportionate stratified random sampling technique with the following distribution: Donorojo (100), Pringkuku (83), Punung (73), Bandar (62), and Nawangan (32 respondents). The independent variables in this study consisted of nine socioeconomic factors. First, education level (X_1) is defined as the highest level of formal education completed by the respondent. Second, income level (X_2) is the total amount of income from various sources in one month. Third, area of cultivated land (X_3) is the area of land controlled and managed for agricultural and forestry activities. Fourth, access to capital (X_4) reflects the respondent's ability to obtain credit from various financing sources. Fifth, business experience (X_5) is the length of time the respondent has been involved in forest management. Sixth, the number of family dependents (X_6) refers to the number of family members living in one household. Seventh, age (X_7) is the respondent's age from birth until the research was conducted. Eighth, access to information and technology (X_8) is the respondent's ability to obtain relevant information for business development. Ninth, social and institutional capital (X_9) includes social networks, norms, trust, and involvement in local

institutions or forest farmer groups. The dependent variable of the research is forest community empowerment (Y). Data were collected through structured questionnaires and field observations as primary data, as well as documents from the Forestry Service and BPS as secondary data.

Multiple linear regression analysis is used to determine the effect of independent variables on dependent variables with the equation model: $Y = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 + \beta_8X_8 + \beta_9X_9 + e$. Before multiple regression analysis, classical assumption tests are carried out including normality tests (Kolmogorov-Smirnov), multicollinearity (Tolerance and VIF), heteroscedasticity, and linearity (Ramsey RESET Test). Hypothesis analysis was carried out through the R^2 test for the coefficient of determination, the F test for simultaneous influence (significant if $p < 0.05$), and the t test for the partial influence of each independent variable on forest community empowerment (significant if $p < 0.05$) (Yusup, 2018).

RESULT AND DISCUSSION

Normality Test

Table 1. Normality Test Results (Kolmogorov - Smirnov Test)

Variables	Kolmogorov-Smirnov Z	Asymp. Sig. (2-tailed)	Information
Unstandardized Residual	0,892	0,403	Normal

Source: Primary Data Processed, 2025

Table 1 shows that the Kolmogorov-Smirnov normality test results show a significance value of 0.403, which is greater than 0.05. This indicates that the residual data is normally distributed and meets the assumptions of normality. Furthermore, the Normal P-P Plot graph shows that the data points are spread around the diagonal line and follow the direction of the diagonal line, which also indicates that the data is normally distributed.

Multicollinearity Test

Table 2. Multicollinearity Test Results

Independent Variables	Tolerance	VIF	Information
Education Level (X_1)	0,724	1,381	There is no multicollinearity
Income Level (X_2)	0,542	1,845	There is no multicollinearity
Area of Cultivated Land (X_3)	0,638	1,567	There is no multicollinearity
Access to Capital (X_4)	0,612	1,634	There is no multicollinearity
Business Experience (X_5)	0,786	1,272	There is no multicollinearity
Number of Family Dependents (X_6)	0,824	1,214	There is no multicollinearity
Age (X_7)	0,748	1,337	There is no multicollinearity
Access to Information & Technology (X_8)	0,586	1,706	There is no multicollinearity
Social & Institutional Capital (X_9)	0,594	1,683	There is no multicollinearity

Source: Author, 2025

Based on Table 2, it can be seen that all independent variables have a Tolerance value > 0.10 and a VIF value < 10 . The Tolerance value ranges from 0.542 to 0.824, while the VIF value ranges from 1.214 to 1.845. This indicates that there is no multicollinearity in the regression model, which means there is no strong correlation between the independent variables so that the regression model is suitable for use.

Heteroscedasticity Test

Table 3. Results of Heteroscedasticity Test (Glejser Test)

Independent Variables	t count	Say.	Information
Education Level (X ₁)	-0,842	0,401	There is no heteroscedasticity
Income Level (X ₂)	1,124	0,262	There is no heteroscedasticity
Area of Cultivated Land (X ₃)	-0,654	0,514	There is no heteroscedasticity
Access to Capital (X ₄)	0,892	0,373	There is no heteroscedasticity
Business Experience (X ₅)	-1,034	0,302	There is no heteroscedasticity
Number of Family Dependents (X ₆)	0,748	0,455	There is no heteroscedasticity
Age (X ₇)	-0,926	0,355	There is no heteroscedasticity
Access to Information & Technology (X ₈)	1,286	0,199	There is no heteroscedasticity
Social & Institutional Capital (X ₉)	-0,984	0,326	There is no heteroscedasticity

Source: Author, 2025

Table 3 shows that the Glejser test results show that all independent variables have a significance value > 0.05 , ranging from 0.199 to 0.514. This indicates that there is no heteroscedasticity in the regression model, meaning the residual variance is constant for all observations. Furthermore, the scatterplot graph shows that the points are randomly distributed above and below the number 0 on the Y-axis and do not form a specific pattern, which also confirms the absence of heteroscedasticity.

Linearity Test

Table 4. Linearity Test Results (Ramsey RESET Test)

Test	F-Statistic	Say.	Information
Ramsey RESET Test	2,148	0,143	The relationship is linear

Source: Author, 2025

Table 4 shows that the Ramsey RESET test results show a significance value of 0.143, which is greater than 0.05. This indicates that the relationship between the independent and dependent variables is linear, thus making the multiple linear regression model suitable for use in this study.

Multiple Linear Regression Analysis

Table 5. Results of Multiple Linear Regression Analysis

Variables	Regression Coefficient (B)	Std. Error	t count	Say.	Information
Permanent	18,245	4,326	4,218	0,000	-
Education Level (X ₁)	2,684	0,842	3,188	0,002	Significant
Income Level (X ₂)	0,0000048	0,0000012	4,000	0,000	Significant
Area of Cultivated Land (X ₃)	6,842	2,124	3,221	0,001	Significant
Access to Capital (X ₄)	1,856	0,468	3,966	0,000	Significant
Business Experience (X ₅)	0,648	0,284	2,282	0,023	Significant
Number of Family Dependents (X ₆)	-1,542	0,612	-2,520	0,012	Significant
Age (X ₇)	0,124	0,098	1,265	0,207	Not Significant
Access to Information & Technology (X ₈)	1,924	0,436	4,413	0,000	Significant
Social & Institutional Capital (X ₉)	1,748	0,398	4,392	0,000	Significant

Source: Author, 2025

Based on Table 5, the multiple linear regression equation formed is:

$$Y = 18,245 + 2,684X_1 + 0,0000048X_2 + 6,842X_3 + 1,856X_4 + 0,648X_5 - 1,542X_6 + 0,124X_7 + 1,924X_8 + 1,748X_9$$

1. Constant (18.245): If all independent variables have a value of zero, then forest community empowerment has a value of 18.245.
2. Education Level (2.684): Each increase in one level of education will increase the empowerment of forest communities by 2.684 units assuming other variables remain constant.
3. Income Level (0.0000048): Every increase in income of Rp. 1,000,000 will increase empowerment by 4.8 units assuming other variables remain constant.
4. Area of Cultivated Land (6,842): Every 1 hectare increase in the area of cultivated land will increase empowerment by 6,842 units assuming other variables remain constant.
5. Access to Capital (1.856): Every 1 unit increase in the capital access score will increase empowerment by 1.856 units assuming other variables remain constant.
6. Business Experience (0.648): Every 1 year increase in business experience will increase empowerment by 0.648 units assuming other variables remain constant.
7. Number of Family Dependents (-1,542): Each additional 1 family dependent will reduce empowerment by 1,542 units assuming other variables remain constant.
8. Age (0.124): Every 1 year increase in age will increase empowerment by 0.124 units, but the effect is not significant.
9. Access to Information & Technology (1.924): Every 1 unit increase in the access to information and technology score will increase empowerment by 1.924 units assuming other variables remain constant.
10. Social & Institutional Capital (1.748): Every 1 unit increase in the social and institutional capital score will increase empowerment by 1.748 units assuming other variables remain constant.

F Test (Simultaneous Test)

Tabel 6. F Test Results (ANOVA)

Model	Sum of Squares	df	Mean Square	F count	Say.	F table
Regression	62.845,326	9	6.982,814	78,452	0,000	1,946
Residual	30.268,674	340	89,026			
Total	93.114,000	349				

Source: Author, 2025

Based on Table 6, it can be seen that the calculated F value is 78.452 with a significance of 0.000. The calculated F value (78.452) > F table (1.946) and significance (0.000) < 0.05, so H_0 is rejected and H_a is accepted. This shows that simultaneously (together) the variables of education level, income level, area of cultivated land, access to capital, business experience, number of family dependents, age, access to information and technology, and social and institutional capital have a significant effect on the empowerment of forest communities in Pacitan Regency.

t-test (Partial Test)

Table 7. t-Test Results

Independent Variables	t count	t table	Say.	Conclusion
Education Level (X ₁)	3,188	1,967	0,002	H ₁ is accepted (significant positive effect)
Income Level (X ₂)	4,000	1,967	0,000	H ₂ is accepted (significant positive effect)
Area of Cultivated Land (X ₃)	3,221	1,967	0,001	H ₃ is accepted (significant positive effect)
Access to Capital (X ₄)	3,966	1,967	0,000	H ₄ is accepted (significant positive effect)
Business Experience (X ₅)	2,282	1,967	0,023	H ₅ is accepted (significant positive effect)
Number of Family Dependents (X ₆)	-2,520	1,967	0,012	H ₆ is accepted (significant negative effect)
Age (X ₇)	1,265	1,967	0,207	H ₇ is rejected (no significant effect)
Access to Information & Technology (X ₈)	4,413	1,967	0,000	H ₈ is accepted (significant positive effect)
Social & Institutional Capital (X ₉)	4,392	1,967	0,000	H ₉ is accepted (significant positive effect)

Source: Author, 2025

Based on Table 7, it can be seen that of the 9 independent variables tested, there are 8 variables that have a significant influence on the empowerment of forest communities (level of education, level of income, area of cultivated land, access to capital, business experience, number of family dependents, access to information and technology, and social and institutional capital), while 1 variable (age) does not have a significant influence.

Coefficient of Determination (R²)

Table 8. results of the coefficient of determination

R	R Square	Adjusted R Square	Std. Error of the Estimate
0,821	0,675	0,666	9,435

Source: Author, 2025

Based on Table 8, it can be seen that the R value is 0.821, which indicates a very strong correlation between the independent variables and the dependent variable. The R Square value of 0.675 indicates that 67.5% of the variation in forest community empowerment can be explained by the independent variables in the model, while the remaining 32.5% is explained by other variables outside the model. The Adjusted R Square value of 0.666 indicates the predictive ability of the model adjusted for the number of variables and samples.

Partial Correlation Analysis

Table 9. Partial Correlation between Independent Variables and Dependent Variables

Independent Variables	Partial Correlation	The Power of Relationships
Education Level (X ₁)	0,454	Currently
Income Level (X ₂)	0,532	Currently
Area of Cultivated Land (X ₃)	0,468	Currently
Access to Capital (X ₄)	0,586	Currently
Business Experience (X ₅)	0,348	Low
Number of Family Dependents (X ₆)	-0,312	Low
Age (X ₇)	0,186	Very Low
Access to Information & Technology (X ₈)	0,624	Strong
Social & Institutional Capital (X ₉)	0,618	Strong

Source: Author, 2025

Table 9 shows that the variables with the strongest partial correlations with forest community empowerment are access to information and technology (r=0.624) and social and institutional capital (r=0.618), which fall into the strong correlation category. The other variables, meanwhile, have moderate to low correlations.

The Influence of Education Level on Forest Community Empowerment

The results of the regression analysis show that the level of education has a positive and significant effect on the empowerment of forest communities in Pacitan Regency with a regression coefficient of 2.684 (t count = 3.188; sig. = 0.002 < 0.05). This means that the higher the level of formal education of forest communities, the higher the level of empowerment. Each increase in one level of education will increase the empowerment score by 2.684 units assuming other variables are constant. This finding supports the first hypothesis (H_1) which states that the level of education has a positive effect on the empowerment of forest communities in Pacitan Regency.

Field conditions indicate that forest communities with higher levels of education (at least junior high school or above) are better able to understand new information and innovations related to sustainable forest management, more readily adopt forest product processing technologies, and more actively participate in group activities and training. They are also more willing to make strategic decisions in business development, such as diversifying forest product lines and seeking broader market access. Conversely, communities with lower levels of education (elementary school or below) tend to be passive, have difficulty understanding new concepts, and rely more on traditional methods of forest management that are often less efficient and sustainable.

The results of this study align with those of Astaman et al., 2025, which found that formal education levels are positively correlated with the ability to adopt forestry technology innovations in community forest communities in Java. Their research showed that forest farmers with at least a junior high school education had 35% higher productivity than those with an elementary school education or less. Similarly, research by Suhaeni et al., 2025 found that education levels influence community participation in social forestry programs, with respondents with a high school education or higher having a participation rate 2.3 times higher than those with an elementary school education.

The findings of this study also support the theory *Human Capital* (Munte, 2025) states that investment in education will increase a person's productivity and income. In the context of empowering forest communities, education functions as human capital. (*human capital*) which increases individual capacity to manage forest resources more efficiently and sustainably. Formal education provides basic skills such as reading, writing, and arithmetic, which are crucial for business management, financial record-keeping, and access to market information. Therefore, improving access to and the quality of education for forest communities is key to the success of empowerment programs in Pacitan Regency.

The Influence of Income Levels on Forest Community Empowerment

The results of the regression analysis show that income levels have a positive and significant effect on the empowerment of forest communities in Pacitan Regency with a regression coefficient of 0.0000048 (t count = 4.000; sig. = 0.000 < 0.05). This means that the higher the income level of forest community households, the higher the level of empowerment. Every increase in income of IDR 1,000,000 will increase the empowerment score by 4.8 units assuming other variables remain constant. This finding supports the second hypothesis (H_2) which states that income levels have a positive effect on the empowerment of forest communities in Pacitan Regency.

Field conditions show that forest communities with higher incomes have better financial capacity to access business capital, purchase equipment and technology for forest product processing, and make long-term investments such as planting perennial crops. They

also have greater economic resilience to price and seasonal fluctuations, making it less likely to fall back into poverty. Conversely, communities with lower incomes often become trapped in a cycle of poverty. (*poverty trap*), where they do not have enough capital to develop their business, are forced to sell forest products at low prices to middlemen, and are unable to set aside savings for future investment.

The results of this study align with those of Safira et al., 2024, which found that income levels significantly influence community welfare and capacity to develop community forestry businesses in Gunung Kidul Regency. This study showed that households with above-average incomes have better business diversification and higher investment capacity. Similarly, research by Amiruddin & Mudhofir, 2024, in a national social forestry survey, found that program participants with significant income increases (above 30%) had higher levels of empowerment than those with stagnant incomes.

This finding also supports the theory Sustainable Livelihood Framework (Soseco et al., 2025) which emphasizes the importance of financial capital (financial capital) as an important asset in the sustainable livelihood of the community. Adequate income provides the capability (capability) This provides households with access to other productive resources such as capital, technology, and information. In the context of empowering forest communities in Pacitan Regency, increased income not only improves material well-being but also increases self-confidence, independence, and the capacity to actively participate in group activities and decision-making. Therefore, empowerment programs need to focus on increasing the added value of forest products through processing, business diversification, and facilitating access to more profitable markets.

The Influence of Cultivated Land Area on Forest Community Empowerment

The results of the regression analysis show that the area of cultivated land has a positive and significant effect on the empowerment of forest communities in Pacitan Regency with a regression coefficient of 6.842 (t count = 3.221; sig. = 0.001 < 0.05). This means that the larger the area of cultivated land controlled by forest communities, the higher the level of empowerment. Every 1 hectare increase in cultivated land area will increase the empowerment score by 6.842 units assuming other variables are constant. This finding supports the third hypothesis (H3) which states that the area of cultivated land has a positive effect on the empowerment of forest communities in Pacitan Regency.

Field conditions indicate that forest communities with larger cultivated plots (more than 1 hectare) have greater opportunities to develop diversified forestry crops, both timber and non-timber forest products (NTFPs). They can implement more complex agroforestry patterns with short-, medium-, and long-term crop combinations, thus providing a more sustainable source of income. Larger plots also provide room for experimentation and innovation without the risk of losing all income sources in the event of failure. Conversely, communities with smaller plots (less than 0.5 hectares) are severely limited in business development options, tend to focus on fast-growing crops with low economic value, and are vulnerable to land degradation due to overexploitation.

The results of this study align with those of Pradnyawati & Cipta (2021), which found that the area of cultivated community forest land has a positive and significant impact on the income of farming households in Gunung Kidul Regency. The study showed that every additional 0.25 hectares of cultivated land increased average income by IDR 850,000 per year. The land area regression coefficient in Hardjanto's study showed a high elasticity value, indicating the importance of expanding land access for forest communities. Similarly,

research by Febriana et al. (2025) found that the area of managed HKm land correlated significantly with the program's success rate, with groups with an average land area above 1 hectare per member performing 45% better.

These findings also support the land-labor ratio theory in agricultural economics, which states that the ratio of land area to labor force influences productivity and income. In the context of forest communities in Pacitan Regency, which generally have sufficient family labor (an average of 4.8 people per household), increasing the area of cultivated land will significantly increase labor productivity. Larger land also provides a better bargaining position in accessing government assistance, credit from financial institutions, and partnerships with companies. Therefore, social forestry policies that provide legal access to communities to manage larger forest areas are crucial for improving the empowerment and welfare of forest communities in Pacitan Regency.

The Influence of Access to Capital on Forest Community Empowerment

The results of the regression analysis show that access to capital has a positive and significant effect on the empowerment of forest communities in Pacitan Regency with a regression coefficient of 1.856 (t count = 3.966; sig. = 0.000 < 0.05). This means that the higher the access of forest communities to capital, the higher the level of empowerment. Every 1 unit increase in the capital access score will increase the empowerment score by 1.856 units assuming other variables are constant. This finding supports the fourth hypothesis (H_4) which states that access to capital has a positive effect on the empowerment of forest communities in Pacitan Regency.

Field conditions indicate that access to capital remains a major obstacle for most forest communities in Pacitan Regency. Of the 350 respondents, 44.6% had limited access to capital. These obstacles include: lack of collateral acceptable to banks, complicated and time-consuming credit procedures, high interest rates (averaging 12-18% per year), and a lack of information about available financing schemes. Communities that successfully access capital, whether from formal institutions (banks, cooperatives) or informal institutions (loan sharks, family), demonstrated better business development, were able to purchase forest product processing equipment, make long-term crop investments, and develop businesses on a more economical scale. Conversely, communities without access to capital were trapped in subsistence businesses with low productivity.

The results of this study align with research by Syarifuddin (2025), which found that access to capital was the dominant factor influencing the success of the Community Forestry program in East Java, with a beta coefficient of 0.45 (the highest among other variables). The study also identified that LMDH groups with access to microfinance institutions or cooperatives had a 2.5 times higher success rate than those without access. Similarly, research by Alfiansyah (2023) in a national survey found that limited capital was the main obstacle reported by 78% of social forestry participants, and only 23% were able to access credit from formal institutions.

These findings support the Credit Rationing theory (Kabul & Afriwan, 2021), which explains that poor communities often face credit rationalization due to asymmetric information and inadequate collateral. In the context of forest communities in Pacitan Regency, access to capital is not only crucial for purchasing production inputs and technology but also for building economic resilience in the face of external shocks such as crop failure or price fluctuations. Adequate capital provides flexibility in business decision-making, enabling communities to avoid selling their crops when prices are low and invest in

increasing product value. Therefore, empowerment programs need to be accompanied by facilitation of easy, affordable access to capital that is appropriate to the characteristics of forestry businesses with relatively long production periods.

The Influence of Business Experience on Forest Community Empowerment

The results of the regression analysis show that business experience has a positive and significant effect on the empowerment of forest communities in Pacitan Regency with a regression coefficient of 0.648 (t count = 2.282; sig. = 0.023 < 0.05). This means that the longer the community's experience in managing forests and forest-based businesses, the higher the level of empowerment. Every one year increase in business experience will increase the empowerment score by 0.648 units assuming other variables are constant. This finding supports the fifth hypothesis (H₅) which states that business experience has a positive effect on the empowerment of forest communities in Pacitan Regency.

Field conditions indicate that forest communities with longer business experience (more than 10 years) possess more in-depth local ecological knowledge regarding the characteristics of plant species, harvest seasons, cultivation techniques appropriate to land conditions, and methods for managing pests and diseases. They also have broader marketing networks, better price negotiation skills, and a better understanding of forest product market dynamics. Long-term experience provides learning through trial and error, making them better able to make informed decisions and manage business risks. Conversely, communities newly involved in empowerment programs (less than 5 years) are still in the learning phase, make more mistakes, and require intensive mentoring.

The results of this study align with research by Pujo (2024), which states that business experience is positively correlated with managerial and decision-making skills in agricultural and forestry businesses. Research by Waskitho (2022) also found that forest farmers with more than 10 years of experience had 28% higher land productivity and a lower business failure rate (15%) compared to farmers with less than 5 years of experience (a failure rate of 42%). However, the coefficient of business experience in this study was relatively smaller (0.648) compared to other variables such as education, income, and access to capital, indicating that experience alone is insufficient without capacity building through formal education and training.

These findings support the learning-by-doing theory in economics, which states that learning through practical experience will increase efficiency and productivity over time. In the context of empowering forest communities, experience seeks to provide tacit knowledge that is difficult to transfer through formal education, such as sensitivity to weather changes, intuition in determining the right harvest time, and the ability to read market opportunities. However, traditional experience needs to be combined with modern knowledge through training and outreach to prevent communities from becoming trapped in old, less efficient methods. Therefore, empowerment programs in Pacitan Regency need to integrate local knowledge with modern technological and management innovations through a participatory learning approach that values community experience while facilitating innovation adoption.

The Influence of the Number of Family Dependents on Forest Community Empowerment

The results of the regression analysis show that the number of family dependents has a negative and significant effect on the empowerment of forest communities in Pacitan Regency with a regression coefficient of -1.542 (t count = -2.520; sig. = 0.012 < 0.05). This

means that the greater the number of family dependents, the lower the level of empowerment. Each additional 1 family dependent will decrease the empowerment score by 1.542 units assuming other variables are constant. This finding supports the sixth hypothesis (H₆) which states that the number of family dependents has a negative effect on the empowerment of forest communities in Pacitan Regency.

Field conditions indicate that families with a large number of dependents (7 or more) face a heavier economic burden in meeting basic needs such as food, clothing, education, and healthcare. A significant proportion of income must be allocated to consumption, severely limiting the ability to save and invest. Heads of families with large numbers of dependents tend to focus on meeting short-term needs and intensively exploit forest resources for quick cash, which is often counterproductive to sustainability. They also have less time to participate in training, group meetings, or other empowerment activities because they must work harder to meet family needs.

The results of this study align with those of Wulandari et al., 2024, which found that the number of dependents in a family has an ambivalent effect, where under certain conditions it can be an economic burden but under other conditions it can be a source of labor. In the context of forest communities in Pacitan Regency, the negative impact is more dominant because the majority of dependents are school-age children and elderly people who are not yet or no longer productive. Data shows that of the average 4.8 dependents per family, only around 2.3 are of productive age and actively working. Research by Pradnyawati & Cipta, 2021 also found a similar pattern, where households with a high dependency ratio have lower levels of participation in social forestry programs due to limited time and resources.

These findings support the life cycle hypothesis, which states that household consumption and savings patterns are influenced by family composition and life cycle (Kholifaturohmah et al., 2023). Families with many school-age children are at a stage with the highest economic burden and the lowest savings capacity. In the context of forest community empowerment, a large number of dependents reduces a family's ability to actively participate in empowerment programs, access new economic opportunities, and make long-term investments. However, it should be noted that if the family's dependents are members of productive age, they can be a potential workforce asset. Therefore, empowerment programs in Pacitan Regency need to consider family demographic characteristics and provide specific support for families with large numbers of dependents, such as educational assistance for children, skills training for adolescents, and health insurance for the elderly, to reduce the economic burden and increase participation in empowerment programs.

The Influence of Age on Forest Community Empowerment

The results of the regression analysis show that age does not significantly influence the empowerment of forest communities in Pacitan Regency with a regression coefficient of 0.124 (t count = 1.265; sig. = 0.207 > 0.05). This means that differences in respondent age do not significantly influence the level of empowerment. This finding does not support the seventh hypothesis (H₇) which states that age has a relationship with the empowerment of forest communities in Pacitan Regency. Although the regression coefficient shows a positive direction, the effect is not statistically significant.

Field conditions indicate that forest community empowerment in Pacitan Regency does not discriminate based on age. The empowerment program involves all LMDH members regardless of age, from young farmers (in their 20s) to senior farmers (in their 60s). The younger age group has advantages in terms of physical strength, openness to innovation, and

the ability to use digital technology, but lacks experience and local ecological knowledge. Conversely, the older age group has extensive experience and wisdom in forest management, but tends to be less open to change and struggles to adopt new technologies. The combination of these two groups within the LMDH institution creates a positive synergy, where young farmers can learn from the experiences of senior farmers, while senior farmers gain access to new technology and information from the younger farmers.

The results of this study differ from those of Huda (2022) in the diffusion of innovation theory, which states that younger age groups tend to be more innovative and quicker to adopt new technologies. However, in the context of collective forest community empowerment through the LMDH institution, age differences are not a significant differentiating factor because learning and knowledge transfer occur collectively within the group. Research by Sulaiman (2021) also found that in community forest management in Java, age does not significantly influence productivity and success; what is more important is the combination of experience (which correlates with age) and openness to innovation (which does not always correlate with age).

These findings indicate that the forest community empowerment program in Pacitan Regency has succeeded in creating an inclusive, cross-generational learning environment. *Participatory* which is used to allow all group members, *regardless of age*, to contribute according to their respective capacities. Senior farmers can serve as resource persons in training on local knowledge and traditional wisdom, while younger farmers can spearhead the adoption of digital technology for online marketing and activity documentation. Therefore, empowerment programs in Pacitan Regency need to maintain this inclusive, cross-generational approach and avoid segmenting programs based on age groups. More importantly, ensure that all age groups have equal access to training, information, capital, and technology, and create effective mechanisms for intergenerational knowledge transfer through mentoring and peer learning within groups.

The Influence of Access to Information and Technology on Forest Community Empowerment

The results of the regression analysis show that access to information and technology has a positive and significant effect on the empowerment of forest communities in Pacitan Regency with a regression coefficient of 1.924 (t count = 4.413; sig. = 0.000 < 0.05). This means that the higher the access of forest communities to information and technology, the higher the level of empowerment. Every 1 unit increase in the score of access to information and technology will increase the empowerment score by 1.924 units assuming other variables are constant. The partial correlation value shows that this variable has a strong relationship ($r = 0.624$) with empowerment. This finding supports the eighth hypothesis (H_8) which states that access to information and technology has a positive effect on the empowerment of forest communities in Pacitan Regency.

Field conditions indicate that access to information and technology remains a major challenge for most forest communities in Pacitan Regency. Of the 350 respondents, 46.9% had limited access to information and technology. These challenges include: limited telecommunications infrastructure in mountainous areas (weak or no internet signal), low smartphone and computer ownership, minimal digital literacy, and limited outreach and training activities. Communities with good access to information and technology demonstrated more progressive business development. They actively sought market price information through the internet and social media, utilized digital platforms for marketing

forest products (marketplaces, Instagram, WhatsApp Business), accessed tutorials and learning videos on cultivation and processing techniques, and utilized simple technologies such as mechanical bamboo cutters, palm sugar processing machines, and forest product dryers that accelerated the production process and improved product quality.

The results of this study align with those of Ardiansyah (2023), who found that access to technology was a dominant factor influencing the success of the HKM program in East Java, with a beta coefficient of 0.38. The study identified that groups receiving assistance with forest product processing technology had product added value 3-5 times higher than those processing traditionally. Similarly, research by Hidayat (2023), in a study of agricultural information systems, found that access to timely and relevant information improves farmers' ability to make strategic decisions and adopt innovations. In today's digital era, limited access to information can lead to information asymmetry that is detrimental to forest communities, particularly in marketing, where they lack knowledge of real market prices and are forced to sell to middlemen at prices far below market prices.

The findings suggest that in a modern economy, knowledge and information are equally important factors of production as capital, labor, and land. In the context of empowering forest communities in Pacitan Regency, access to information and technology provides multiple benefits: (1) increasing production efficiency through the adoption of appropriate technology, (2) strengthening bargaining positions in marketing by having market price information, (3) opening access to wider markets through digital platforms, (4) increasing capacity through online learning and information exchange between farmers, and (5) accelerating access to government assistance and programs. Therefore, empowerment programs in Pacitan Regency need to systematically integrate components of increasing access to information and technology, including: development of telecommunications infrastructure in remote areas, digital literacy training for forest communities, provision of appropriate technology for processing forest products through assistance or soft credit schemes, development of a real-time market price information system for forest products, and facilitation of digital marketing through e-commerce and social media.

The Influence of Social Capital and Institutions on Forest Community Empowerment

The results of the regression analysis show that social and institutional capital have a positive and significant effect on the empowerment of forest communities in Pacitan Regency with a regression coefficient of 1.748 (t count = 4.392; sig. = 0.000 < 0.05). This means that the stronger the social and institutional capital owned by forest communities, the higher the level of empowerment. Every 1 unit increase in the social and institutional capital score will increase the empowerment score by 1.748 units assuming other variables are constant. The partial correlation value shows that this variable has a strong relationship ($r = 0.618$) with empowerment. This finding supports the ninth hypothesis (H_9) which states that social and institutional capital have a positive effect on the empowerment of forest communities in Pacitan Regency.

Field conditions indicate that the LMDH (Forest Village Community Institution) in Pacitan Regency plays a crucial role as a collective forum for forest communities. LMDH functions as: (1) a facilitator in accessing government programs and external assistance, (2) a mediator in resolving conflicts between members or with external parties, (3) a learning institution through regular meetings, training, and comparative studies, (4) an organizer of collective activities such as mass planting, plant maintenance, and joint harvesting, (5) a collective marketing forum that strengthens bargaining power, and (6) a guardian of norms

and rules of the game in sustainable forest management. LMDH with a high level of member participation, strong leadership, transparency in financial management, and extensive external networks demonstrate better performance in improving the welfare of its members. Conversely, LMDH that are only active when there are programs or assistance from the government tend to be ineffective in empowering its members.

The results of this study align with research by Syarifuddin (2025), which found that well-functioning LMDH institutions increase member participation and income by an average of 35% through collective action mechanisms, risk sharing, and economies of scale in marketing. Research by Riyanto (2025) also emphasizes the importance of social capital in the form of mutual cooperation, trust, and community involvement. (*trust*), and reciprocity in community forest management in Java. Strong social capital reduces transaction costs, increases compliance with shared rules, and facilitates collective action in managing shared resources. (*common pool resources*). Research (Huda, 2022) shows that shared natural resource management will be successful if supported by strong local institutions with clear rules, effective monitoring mechanisms, tiered sanctions for violators, and fair conflict resolution forums.

These findings support the theory of social capital (Alfiansyah, 2023), which states that social capital is a resource inherent in the structure of social relations and can be mobilized to achieve common goals. In the context of forest community empowerment in Pacitan Regency, social capital functions as: (1) bridging capital that connects communities with external resources such as government programs, financial institutions, and markets, (2) bonding capital that strengthens solidarity and internal group cooperation, and (3) linking capital that connects the local level with higher policy levels. Strong LMDH institutions with high social capital can compensate for the limitations of financial and human capital possessed by forest communities. Through group mechanisms, communities can access low-interest capital through a group savings and loan system, share information and knowledge about cultivation and marketing techniques, purchase inputs together to obtain lower prices, and sell harvests collectively to obtain higher prices. Therefore, strengthening LMDH institutions must be a top priority in the forest community empowerment program in Pacitan Regency, including: organizational and financial management training for LMDH administrators, facilitating the development of collective businesses such as cooperatives and joint business groups, strengthening networks between LMDHs for the exchange of learning and experience, and support for building strategic partnerships with the private sector, NGOs, and universities.

CONCLUSION

Based on the results of research and discussion on socio-economic factors that influence the empowerment of forest communities in Pacitan Regency, it was concluded that simultaneously, nine socio-economic factors studied had a significant influence on the empowerment of forest communities in Pacitan Regency with a contribution of 67.5%. Partially, eight factors were proven to have a significant influence: education level, income level, area of cultivated land (with the highest coefficient of 6.842), access to capital, business experience, number of family dependents (negative influence), access to information and technology, and social and institutional capital. Access to information and technology ($r=0.624$) and social and institutional capital ($r=0.618$) had the strongest partial correlation, indicating the importance of digital transformation and strengthening LMDH in

empowerment. Only the age variable did not have a significant influence, indicating the success of an inclusive, cross-generational empowerment program. To increase the effectiveness of empowerment, a comprehensive policy is needed that includes increasing access to education, capital, technology, expanding access to legal land, strengthening LMDH institutions, and special support for families with large dependents through a holistic, participatory, and sustainable approach.

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