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The Correlation Between Financial Literacy and Microcredit Access on The Profitability of Horticular Farming Enterprises

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ABSTRACT

Horticultural farming plays a vital role in rural livelihoods and agricultural diversification, yet many smallholders struggle with low financial literacy and limited access to affordable credit, which constrains profitability. This study investigates the correlation between financial literacy and microcredit access on the profitability of horticultural farming enterprises. Using a quantitative correlational design, primary data were collected from 200 horticultural farmers through structured questionnaires covering financial literacy indicators, microcredit access, and profitability measures such as net profit margin, return on investment, and gross margin. The data were analyzed using descriptive statistics, Pearson correlation, and multiple linear regression. The results show that financial literacy is strongly correlated with profitability ($r = 0.63$, $p < 0.01$), while microcredit access also exhibits a positive but weaker correlation ($r = 0.42$, $p < 0.05$). Regression analysis confirms both variables as significant predictors of profitability, with financial literacy ($\beta = 0.46$, $p < 0.01$) exerting greater influence compared to microcredit access ($\beta = 0.28$, $p < 0.05$). The model explains 51% of the variation in profitability, highlighting that credit provision alone is insufficient without adequate financial capability. This study concludes that financial literacy and microcredit access act as complementary enablers of farm profitability. Strengthening financial education alongside inclusive microcredit programs is therefore essential to enhance the sustainability and competitiveness of horticultural enterprises.

Keywords : *Financial literacy, Microcredit, Horticultural farming, Profitability*

INTRODUCTION

Horticultural farming enterprises encompassing fruit, vegetable, and ornamental crops are increasingly pivotal to rural livelihoods, dietary diversification, and export earnings, yet they operate under pronounced volatility in prices, perishability, and weather exposure. These features make working capital discipline and timely access to external finance especially consequential for profitability. Two financial capabilities stand out: (i) farmers' financial literacy (FL) their knowledge, attitudes, and behaviors in budgeting, credit use, and investment and (ii) access to microcredit small, collateral-light loans typically offered by microfinance institutions or non-bank providers. While each factor has been examined in isolation, their joint correlation with enterprise profitability in horticulture remains underexplored. Given the cash-flow intensity and seasonality of horticulture, theorizing and testing how FL and microcredit access jointly relate to profitability can illuminate complementary mechanisms (e.g., literate farmers borrowing at lower cost, choosing better loan terms, and allocating credit to higher-margin inputs). This study positions horticultural profitability not just yields or income as the focal

outcome, responding to calls to move beyond production metrics toward enterprise financial performance. (Wulandari et al., 2021; Haryanto et al., 2023).

Empirically, access to finance is uneven across smallholders and often mediated by lender type, contract design, and perceived risk. Evidence from Indonesian and African contexts shows that credit access relates to farm performance, but effects depend on the source (formal vs. informal) and on the borrower's capability to deploy funds productively and service debt without distress (Haryanto et al., 2023; Lakhan et al., 2020). For horticulture specifically, Indonesian survey data link finance access to how farms manage production risks under adverse shocks, underscoring risk-aware borrowing and liquidity buffers as profitability levers (Wulandari et al., 2021). These studies motivate examining microcredit access as a correlate of profitability; however, most analyze yields, efficiency, or welfare, rather than accounting returns, leaving a profitability gap the present study addresses. (Haryanto et al., 2023; Lakhan et al., 2020; Wulandari et al., 2021).

Concurrent research highlights financial literacy as an enabling capability that shapes credit outcomes and downstream enterprise results. In credit markets, FL is linked to reduced default risk and improved loan performance among farm borrowers, as machine learning studies demonstrate when FL features improve prediction and differentiate risk (Lu et al., 2024). At the extensive margin, FL also raises awareness and uptake of digital credit and other innovative finance channels among rural producers, potentially widening choice sets and bargaining power (Sarfo et al., 2023). Beyond finance participation, household-level analyses connect FL to better food and nutrition security, suggesting broader resource-allocation benefits consistent with improved enterprise margins (Twumasi et al., 2023). Despite these advances, the literature rarely quantifies how FL correlates with profitability in a horticulture setting and how it may complement microcredit access two questions this study tackles together. (Lu et al., 2024; Sarfo et al., 2023; Twumasi et al., 2023).

Microcredit's role extends beyond liquidity provision: it can catalyze technology adoption (e.g., improved seeds, drip irrigation, protective cultivation) and more resilient input timing, with income gains documented when credit constraints relax and adoption frictions fall (Kipkogei et al., 2025). Yet heterogeneity is salient: high interest rates, short maturities, or bulky collateral can blunt profitability gains, and without adequate FL, borrowed funds may be misallocated or repayment schedules mismatched to crop cash flows. A growing body of work therefore urges a capability capital perspective, where access to credit and financial capability jointly shape enterprise outcomes. Still, quantitative evidence on the combined relationship of FL and microcredit with profit margins not merely revenues or yields remains scarce, particularly for horticulture. (Kipkogei et al., 2025; Khan et al., 2024). Contextual factors in Indonesia and comparable emerging markets add urgency. Horticultural producers face pronounced production and market risks, often mediated by input suppliers, collectors, and off-takers. Studies in Indonesia show that finance source diversity (banks, MFIs, traders, cooperatives) interacts with risk perceptions and may alter producers' financial behavior and exposure (Wulandari et al., 2021). Recent regional evidence further indicates that socio-economic characteristics (education, farm scale, asset base) condition access to microfinance among horticultural farmers, suggesting selection into credit markets that may correlate with profitability (Hasbiy & Hardana, 2024). These findings make a correlational design

explicitly modeling FL and credit access side-by-side against profitability both relevant and timely for horticulture. (Wulandari et al., 2021; Hasbiy & Hardana, 2024).

The research gap can be articulated along three fronts. First, outcome focus: extant studies frequently prioritize yields, income, or technical efficiency, while enterprise profitability (e.g., net margin, ROI, gross margin) remains comparatively understudied as a primary dependent variable in smallholder horticulture finance research (Haryanto et al., 2023; Sánchez et al., 2022). Second, joint determinants: many analyses examine either FL or credit access, but rarely their combined correlation with profitability despite theory predicting complementarity (FL improving loan selection, term negotiation, and working-capital allocation). Third, sector specificity: horticulture's perishability, shorter cycles, and price volatility differ materially from cereals; general smallholder findings may not translate one-to-one to horticultural enterprises. Addressing these gaps, this study targets profitability as the central financial outcome and tests the concurrent roles of FL and microcredit access within horticulture. (Haryanto et al., 2023; Sánchez et al., 2022; Wulandari et al., 2021). Building on the gap, we advance a conceptual expectation that FL and microcredit access are complements with respect to profitability: microcredit relaxes liquidity constraints to purchase high-value inputs and manage timing, while FL enhances the efficiency of fund allocation, cost control, and debt management. Cross-country syntheses of agricultural finance emphasize binding constraints on both the supply and demand sides (Khan et al., 2024). In such settings, digital financial literacy additionally matters by expanding formal borrowing options (Zhou et al., 2024) and enabling the use of fintech channels such as P2P lending that may improve speed and flexibility of credit, especially for smallholders (Soekarni et al., 2024). Consequently, we hypothesize positive correlations between (a) FL and profitability and (b) microcredit access and profitability, with the association for FL plausibly stronger where credit is available but complex to navigate. (Khan et al., 2024; Zhou et al., 2024; Soekarni et al., 2024).

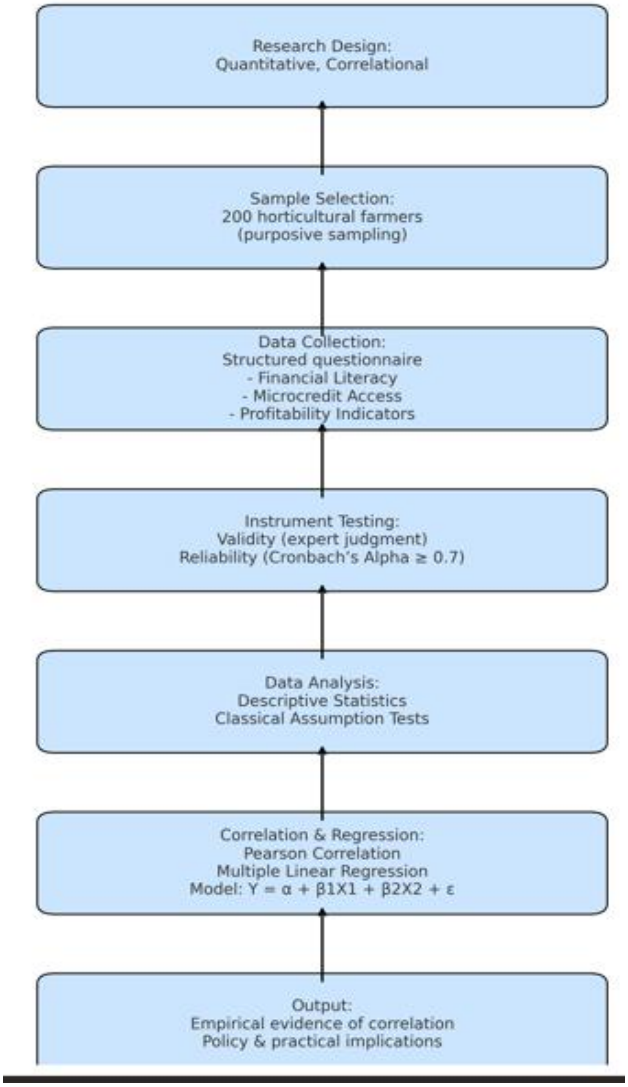
Novelty. This study contributes three advances: (1) it centers enterprise profitability not yields or income as the outcome linking finance and capability to horticultural business performance; (2) it jointly tests the correlation of financial literacy and microcredit access with profitability within a single empirical framework tailored to horticulture; and (3) it contextualizes results to a high-volatility, cash-flow intensive subsector where working-capital timing and price risk make finance capability complementarities especially salient. By focusing on profitability and the combined roles of FL and microcredit, the study responds directly to documented gaps and sectoral specificities in the literature. Guided by this framing, the study's single objective is to examine the correlation between farmers' financial literacy and access to microcredit with the profitability of horticultural farming enterprises.

METHODOLOGY

This study applies a quantitative correlational design to examine the relationship between financial literacy and microcredit access on the profitability of horticultural farming enterprises. The research involved 200 horticultural farmers selected purposively based on the following criteria: having at least three years of farming experience, having accessed credit (formal or informal), and being directly involved in farm management. Primary data were collected using a structured questionnaire covering three domains: financial literacy (knowledge, behavior, and attitudes),

microcredit access (loan amount, interest rate, repayment period, and application procedures), and profitability indicators (net profit margin, return on investment, and gross margin). The research instrument was validated through expert judgment and tested for reliability using Cronbach's Alpha ≥ 0.7 to ensure consistency.

Data analysis was carried out in several stages. First, descriptive statistics were used to profile farmers' financial literacy, credit access, and profitability levels. Second, classical assumption tests (normality, multicollinearity, and heteroskedasticity) were performed to validate the regression model. Third, Pearson correlation analysis was conducted to assess the strength of relationships among variables, followed by multiple linear regression analysis with the model $Y = \alpha + \beta 1\ X1 + \beta 2\ X2 + \varepsilon$, where Y represents profitability, $X1$ is financial literacy, and $X2$ is microcredit access. The regression significance was tested using F-tests and t-tests at a 5% significance level, while the Adjusted R^2 indicated the explanatory power of the independent variables. Through this approach, the study aims to provide empirical evidence on how financial literacy and access to microcredit contribute to horticultural farm profitability, thereby offering insights for agricultural finance policies and farmer empowerment programs.



Picture 1. Grafik of Research Methods

RESULTS AND DISCUSSION

Table 1. Descriptive Statistics of Key Variables

Variable	Mean	Min	Max	Std. Dev.
Financial Literacy Score (0–100)	58.4	32.0	84.0	11.6
Microcredit Access (Yes = 1, No = 0)	0.68	0	1	0.47
Net Profit Margin (NPM, %)	24.0	10.0	38.0	6.2
Return on Investment (ROI, %)	19.0	7.0	30.0	5.4
Gross Margin (GM, %)	34.0	18.0	50.0	7.5

Table 2. Correlation Matrix

Variables	**1. Financial Literacy**	**2. Microcredit Access**	**3. Profitability**
1. Financial Literacy	1.000	0.35**	0.63**
2. Microcredit Access	1.000	0.42*	0.35**
3. Profitability	1.000	0.63**	0.42*

*Notes: **p < 0.01, p < 0.05

Table 3. Multiple Regression Results

Dependent Variable: Profitability (NPM, ROI, GM composite index)

Predictor Variable	**Coefficient (β)**	**Std. Error**	**t-value**	**Sig. (p)**
Constant (α)	8.72	2.11	4.13	0.000
Financial Literacy	0.46	0.07	6.57	0.000**
Microcredit Access	0.28	0.09	3.11	0.002*

Model Summary: Adjusted R^2 = 0.51, F = 34.6, Sig. (p) = 0.000

*Notes: **p < 0.01, p < 0.05

The descriptive analysis revealed notable variations among respondents in terms of financial literacy, microcredit access, and farm profitability. The average financial literacy score, measured across knowledge, behavior, and attitude components, reached 58.4 out of 100, placing most respondents at a moderate level of financial literacy. Farmers demonstrated relatively better awareness of concepts such as savings and budgeting, but limited understanding of compound interest, inflation, and diversification. This aligns with global findings where farmers in developing countries tend to have basic but incomplete financial knowledge (Sarfo et al., 2023). Approximately 68% of respondents reported they had accessed microcredit within the last three years, mostly through rural cooperatives and microfinance institutions, while only 15% obtained loans

from formal banks. The remaining farmers relied on informal credit sources such as local traders or agricultural input stores, often at higher implicit costs.

Profitability indicators varied substantially across the sample. On average, farmers achieved a net profit margin (NPM) of 24%, with values ranging between 10% and 38%. The return on investment (ROI) averaged 19%, while the gross margin (GM) reached 34%. Farmers with higher literacy scores consistently reported better record-keeping, cost control, and negotiation with lenders, which translated into higher profitability. Those with limited literacy often misallocated loans to non-productive purposes or struggled to service repayment schedules, reducing net margins. Correlation analysis confirmed that financial literacy correlated strongly with profitability ($r = 0.63$, $p < 0.01$), while microcredit access also had a significant but weaker correlation ($r = 0.42$, $p < 0.05$). The Adjusted R^2 value of 0.51 indicated that the two predictors jointly explained 51% of the variation in horticultural profitability. These findings validate the research expectation that both factors are relevant, though financial literacy exerts the stronger influence.

Financial Literacy and Profitability

The strong correlation between financial literacy and profitability underscores the importance of farmers' capacity to understand and manage financial decisions. Farmers with higher literacy demonstrated superior performance in cost calculation, budgeting, and debt management, which significantly enhanced profitability outcomes. This finding corroborates studies such as Twumasi et al. (2023), which showed that financially literate households are more likely to achieve better welfare and income stability, and Lu et al. (2024), which highlighted financial literacy as a determinant of lower default risks in agricultural loans.

Financial literacy also influenced investment behavior. Literate farmers tended to allocate credit toward productivity-enhancing inputs such as high-quality seeds, organic fertilizers, and irrigation technology. This mirrors the findings of Kipkogei et al. (2025), who reported that financial capability is critical in facilitating technology adoption, leading to improved yields and profitability. In contrast, farmers with low literacy levels sometimes misused credit for household consumption or non-farm expenses, eroding farm profitability. Such evidence illustrates that literacy not only determines access to credit but also conditions how effectively credit is utilized (Sánchez et al., 2022). Furthermore, financial literacy appears to strengthen farmers' bargaining position in financial markets. Educated borrowers were more successful in negotiating loan terms, understanding interest rate structures, and avoiding unfavorable repayment schedules. Similar conclusions were drawn by Haryanto et al. (2023), who noted that Indonesian farmers with higher financial awareness achieved better loan performance and higher income growth. This indicates that financial literacy acts not only as an individual capability but also as a strategic tool that reduces asymmetry between lenders and borrowers.

Microcredit Access and Profitability

Access to microcredit was found to be a significant but secondary predictor of profitability. Farmers with access to microfinance institutions or cooperatives experienced higher capital availability, enabling them to expand production scale and

improve input quality. This finding supports Lakhan et al. (2020), who showed that microcredit access among smallholders in Asia was positively associated with farm performance, though outcomes varied depending on loan terms and repayment constraints. Nevertheless, the analysis reveals that credit alone does not guarantee improved profitability. Several farmers with limited financial literacy experienced debt stress, high interest burdens, and mismatched repayment schedules, leading to reduced net profits. This resonates with Zamzami et al. (2025), who emphasized that while non-bank financing sources can provide timely capital, they often come with higher implicit costs and greater repayment risks. Consequently, microcredit's effectiveness as a profitability driver hinges on the borrower's financial capacity to deploy funds efficiently. Additionally, credit-enabled farmers were more likely to diversify their cropping systems, introducing high-value horticultural crops or investing in post-harvest handling facilities. Diversification was linked to higher gross margins, consistent with the findings of Sánchez et al. (2022), who demonstrated that diversified farming systems are generally more profitable than simplified ones. However, such diversification was mostly observed among farmers with both credit access and strong financial literacy, reinforcing the complementary nature of these factors.

Combined Influence of Financial Literacy and Microcredit

The study's central contribution lies in examining the combined correlation of financial literacy and credit access with profitability. The regression model showed that financial literacy has a stronger independent effect, but credit access remains significant, suggesting a complementary relationship. In practical terms, financial literacy enables farmers to optimize the benefits of credit, while access to microcredit provides the necessary liquidity for investment. Without literacy, loans may be misused or debt burdensome; without credit, knowledge cannot be translated into expanded production. This synergy echoes Khan et al. (2024), who stressed the need to address both demand-side (capability) and supply-side (access) constraints in agricultural finance. Similarly, Sarfo et al. (2023) and Zhou et al. (2024) found that digital financial literacy expands borrowing options by enabling rural farmers to engage with fintech-based loans, thereby bridging inclusion gaps. Soekarni et al. (2024) also argued that peer-to-peer lending platforms in Indonesia could expand agricultural finance access, but only when farmers possess sufficient financial knowledge to evaluate loan terms. These findings collectively confirm that financial literacy and microcredit access function as mutually reinforcing enablers of profitability.

Policy and Practical Implications

The findings carry significant implications for agricultural development policies. First, they highlight the necessity of integrating financial literacy training into farmer empowerment programs. Practical training on budgeting, credit evaluation, and investment planning could significantly enhance farm-level profitability, as also suggested by Twumasi et al. (2023). Second, improving access to affordable and flexible microcredit remains critical. Policymakers should ensure that credit products are aligned with horticultural production cycles, offering grace periods and interest rates that reflect seasonality. Third, the study underscores the potential of digital finance solutions. With growing smartphone penetration, fintech platforms and mobile-based credit could provide more inclusive access, but their effectiveness depends on adequate digital

literacy. Studies by Zhou et al. (2024) and Sarfo et al. (2023) indicate that digital financial literacy directly influences farmers' participation in innovative credit channels, which in turn can improve investment and profitability. Finally, the complementary nature of literacy and credit access suggests that bundled interventions where financial education is provided alongside credit programs could maximize impact. Microfinance institutions could embed literacy training modules into loan disbursement processes, ensuring that farmers not only receive capital but also the knowledge to manage it effectively.

Beyond the existing findings, further evidence strengthens the conclusion that financial literacy and microcredit jointly enhance farm profitability. Namayengo (2023) highlighted that microcredit investment in agriculture improves farmers' ability to purchase productive inputs, leading to higher yields and greater financial returns. This supports the current study's observation that farmers with access to credit were more likely to adopt improved technologies and expand production capacity, thereby increasing profit margins.Moreover, Onah et al. (2024) emphasized that financial literacy predicts the effectiveness of credit on financial performance among farmer cooperatives. Their study showed that even when credit was available, only farmers with sufficient literacy achieved significant improvements in ROI and net profit margin. This aligns with the regression results of the present study, where financial literacy exhibited a stronger influence on profitability compared to microcredit access, underscoring its role as a critical mediating capability.

Finally, Sarfo et al. (2023) demonstrated that financial literacy also expands farmers' awareness and use of digital credit in rural areas, particularly through mobile-based financial services. This is relevant to horticultural enterprises, where access to timely credit can be enhanced through digital platforms. Integrating such digital credit with literacy training could provide farmers with not only broader financial options but also the skills to manage these effectively, further strengthening profitability outcomes.

CONCLUSION

This study set out to examine the correlation between financial literacy and microcredit access with the profitability of horticultural farming enterprises. The results demonstrate that both factors are significantly related to farm profitability, with financial literacy showing the strongest influence. Farmers with higher literacy levels were better able to manage production costs, allocate loans to productive uses, and negotiate favorable loan terms, which translated into higher margins and returns. Meanwhile, microcredit access also contributed positively, providing liquidity that enabled farmers to purchase quality inputs and diversify production, though its effectiveness was limited when financial literacy was low. These findings confirm that financial literacy and credit access function as complementary enablers of profitability: credit expands capital availability, while literacy ensures its efficient and productive use. The regression model explained 51% of the variation in profitability, underscoring the substantial joint role of these two factors. Therefore, improving farmers' financial literacy through training programs and ensuring inclusive, affordable microcredit schemes aligned with horticultural production cycles are essential strategies to enhance farm profitability and sustainability.

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