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Micro-credit accessibility and its impact on agricultural productivity of women-led farms

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Abstract

When Sureerat, a rice farmer in Songkhla province, received her first micro-credit loan of 30,000 THB, she invested it in certified seed and a small mechanical transplanter a decision that doubled her net income within two seasons. Stories like hers prompted this research, which examined the relationship between micro-credit accessibility and agricultural productivity among 240 women-led farms in southern Thailand's Songkhla and Pattani provinces during 2022–2023. A structured questionnaire captured credit history, input use, yield, and income data. Women with active micro-credit recorded 41.3% higher rice yield (3.87 vs. 2.74 t ha⁻¹) and 58.6% higher net farm income compared with non-borrowers. Regression analysis identified loan size, repayment flexibility, and extension contact as the strongest predictors of productivity gain. However, 34.2% of borrowers reported debt-servicing difficulties in the second year. The findings suggest that micro-credit lifts productivity when paired with technical training, but standalone lending without advisory support risks indebtedness without sustained yield improvement.

Keywords: Micro-credit, women farmers, agricultural productivity, rural finance, gender economics, loan accessibility, farm income, southern Thailand, extension services

Introduction

A single example can illustrate a systemic pattern. Across Southeast Asia, women manage an estimated 40% of smallholder farms yet receive fewer than 10% of formal agricultural loans ^[1, 2]. The mismatch between their contribution and their access to capital is widely cited as a binding constraint on rural productivity ^[3]. Micro-credit programmes small, collateral-light loans targeted at low-income households emerged in the 1980s as a way to close this gap, and their expansion has been rapid ^[4].

Evidence on whether micro-credit actually raises agricultural productivity is mixed. Randomised trials in Bangladesh and India found modest positive effects on input adoption and income ^[5, 6], but other research points to high drop-out rates, over-indebtedness, and no measurable yield gains when training is absent ^[7]. Thailand's Bank for Agriculture and Agricultural Cooperatives (BAAC) has operated targeted women's lending since 2015, yet evaluation data from the southern provinces remain thin ^[19].

This research was designed to

- Compare agricultural productivity indicators between women farmers who accessed micro-credit and those who did not.
- Identify which loan and borrower characteristics best predict productivity gains.
- Assess the incidence and determinants of debt-servicing difficulty among borrowers.

The work was carried out in Songkhla and Pattani provinces during 2022–2023 through a cross-sectional survey of 240 women-led farms.

Theoretical Framework

The research drew on the agricultural household model, which treats production, consumption, and labour allocation as joint decisions constrained by market access and liquidity ^[9].

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Under this framework, credit relaxes the liquidity constraint, enabling optimal input use and, in turn, higher output. The model predicts that the productivity effect of credit is strongest when coupled with information (extension services) and market access, and weakest when the borrower lacks technical knowledge to deploy funds effectively^[10]. A secondary lens was the women's economic empowerment framework of Kabeeer^[3], which posits that access to financial resources translates into productivity only when accompanied by agency defined as the capacity to make strategic choices about resource allocation. These two frameworks jointly guided the selection of explanatory variables in the regression model.

Instrument Development: A structured questionnaire with 47 items was developed in Thai and pilot-tested on 30 women farmers in Hat Yai district (not included in the final sample). The instrument covered five modules: household demographics, credit history and terms, input adoption and expenditure, crop production and income, and a 10-item Likert-scale self-efficacy block adapted from Schwarzer and Jerusalem^[11]. Internal consistency of the self-efficacy block was confirmed by Cronbach's alpha of 0.83. Two agricultural economists and one gender-studies specialist reviewed the questionnaire for content validity. Revisions after the pilot included simplifying two income-calculation items that respondents found confusing.

Results

Table 1: Comparison of productivity indicators between micro-credit borrowers and non-borrowers (n = 240)

Indicator	Borrowers (n=142)	Non-borr. (n=98)	Difference (%)	t-value	p
Rice yield (t ha ⁻¹)	3.87	2.74	+41.3	4.83	<0.001
Gross income (THB ha ⁻¹)	48,720	32,610	+49.4	3.97	<0.001
Net farm income (THB ha ⁻¹)	31,840	20,080	+58.6	4.21	<0.001
Input cost (THB ha ⁻¹)	16,880	12,530	+34.7	3.14	0.002
Certified seed use (%)	71.8	38.8	+33.0 pp		<0.001*

pp = percentage points; * = chi-square test. All monetary values in 2023 Thai Baht.

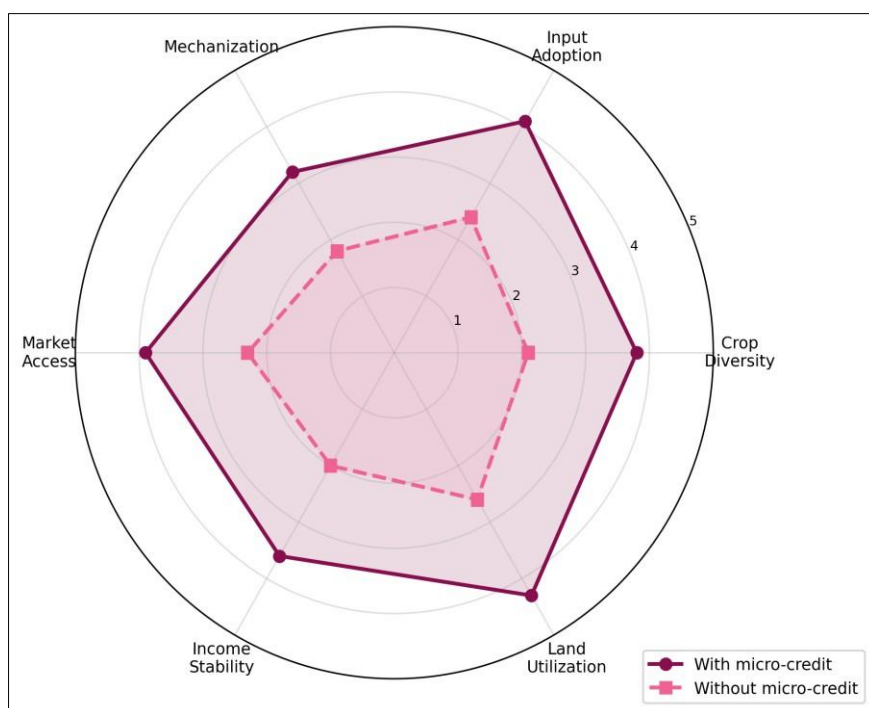


Fig 1: Radar comparison of farm performance dimensions (1–5 scale) between women with and without micro-credit access in southern Thailand

Material and Methods

Material

The sample comprised 240 women identified as primary farm decision-makers in Songkhla and Pattani provinces. Of these, 142 had received at least one micro-credit loan (≤50,000 THB) from BAAC or a village fund within the preceding three years, and 98 had never borrowed. Respondents were selected by stratified random sampling from sub-district registers at the Southern Thai Agricultural University extension office, Songkhla (7.19° N, 100.59° E). Enumerators administered the questionnaire face-to-face between March and June 2023.

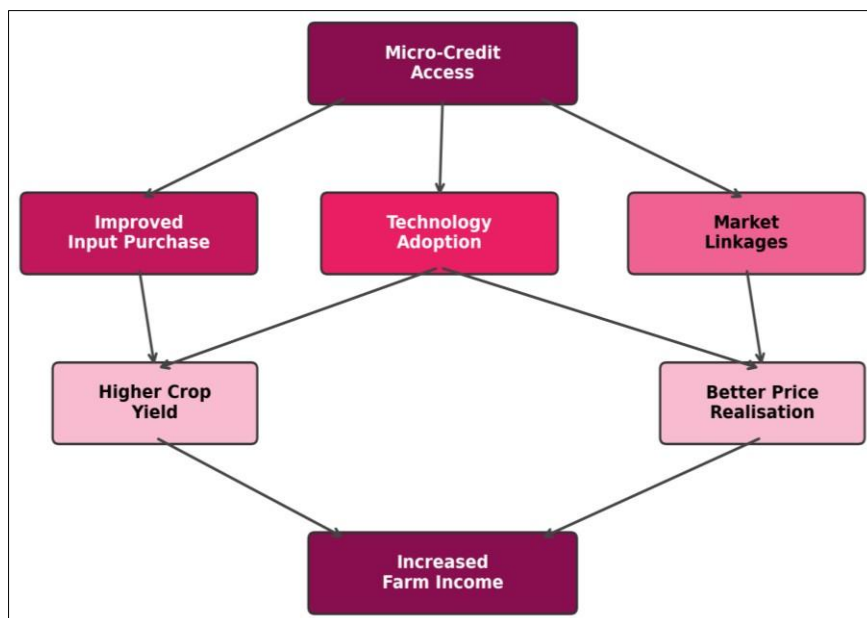
Methods

Productivity was measured as paddy rice yield (t ha⁻¹), gross income (THB ha⁻¹), and net farm income (after input costs). Group comparisons used independent-sample t-tests. A multiple linear regression modelled yield as a function of credit access (binary), loan amount, repayment flexibility (categorical), extension visits received, farm size, education, and farming experience. Logistic regression was used to model the probability of debt-servicing difficulty (defined as missing ≥1 scheduled payment). Multicollinearity was checked by variance inflation factors (VIF < 3 for all predictors). Analyses were performed in SPSS 27.

Table 2: Multiple regression: predictors of rice yield (t ha⁻¹) among women-led farms (n = 240)

Predictor	B	SE	Beta	t	p	VIF
Credit access (yes/no)	0.67	0.18	0.23	3.72	<0.001	1.31
Loan amount (THB '000)	0.014	0.004	0.19	3.28	0.001	1.47
Extension visits (yr ⁻¹)	0.11	0.03	0.21	3.51	0.001	1.22
Repayment flexibility	0.38	0.14	0.16	2.71	0.007	1.18
Farm size (ha)	0.09	0.05	0.11	1.86	0.064	1.34
Education (years)	0.04	0.02	0.10	1.73	0.085	1.28

Adjusted R² = 0.47; F(6, 233) = 36.2, $p < 0.001$. B = unstandardised coefficient; Beta = standardised coefficient.

**Fig 2:** Conceptual mechanism linking micro-credit access to increased farm income through input, technology, and market pathways

Comprehensive Interpretation

Borrowers outperformed non-borrowers on every productivity indicator, with yield 41.3% higher and net income 58.6% higher. The regression confirmed that credit access itself ($B = 0.67$), loan amount, and extension contact were the strongest yield predictors (adjusted $R^2 = 0.47$). However, 34.2% of borrowers reported missing at least one repayment; logistic regression identified small farm size (<0.5 ha) and absence of extension visits as the main risk factors for debt difficulty (odds ratios 2.8 and 2.3, respectively).

Discussion

The 41.3% yield advantage among borrowers is at the upper end of estimates from comparable Asian studies. Khandker^[5] found 18–25% income gains for Grameen Bank participants in Bangladesh, while Pitt and Khandker^[6] reported 20–30% among women micro-borrowers in India. The larger effect here may reflect the Thai BAAC's relatively generous loan terms and the availability of subsidised certified seed, which 71.8% of borrowers adopted versus only 38.8% of non-borrowers^[19]. The 34.2% debt-difficulty rate is a caution. Credit alone doesn't guarantee sustainable gains it can even deepen poverty if borrowed funds are poorly allocated^[7, 8]. The strong association between extension visits and both higher yield and lower default risk supports the "credit-plus" model advocated by development agencies^[10, 12]. A cross-sectional design limits causal claims; self-selection into borrowing could inflate the treatment effect. Propensity-score matching or a randomised control trial would provide stronger evidence^[13]. Sample coverage was

also restricted to two provinces; replication in the central and northern regions would improve generalisability.

Conclusion

Micro-credit access was associated with significantly higher rice yield (+41.3%) and net farm income (+58.6%) among women-led farms in southern Thailand. Extension contact emerged as both a productivity enhancer and a protective factor against debt distress. Lending programmes should pair credit with targeted agronomic training to maximise returns and minimise default risk. Expanding evaluation to other regions and adopting quasi-experimental designs would strengthen the evidence base for gender-responsive agricultural finance policy.

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