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The influence of social trust, place attachment, and self-efficacy on farmers' commitment to agricultural land in Sukoharjo, Central Java, Indonesia

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Tel.:+62-274-6492340, Fax.: +62-274-589595, ♥email: dhanumuktiwibowo@gmail.com
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Abstract. *Wibowo DM, Saputra E, Sudrajat. 2026. The influence of social trust, place attachment, and self-efficacy on farmers' commitment to agricultural land in Sukoharjo, Central Java, Indonesia. Asian J Agric 10 (1): g100163. https://doi.org/10.13057/asianjagric/g100163.* The sustainability of agricultural practices in Indonesia, as a developing country, is threatened by land conversion, with non-agricultural uses continuing to put pressure on agricultural land. This situation, which further weakens farmers' commitment to agricultural land and related activities, demands cooperative behavior from farmers and institutions, reflecting the presence of social trust. This study empirically examines how to verify the relationship between interpersonal and institutional trust and farmers' commitment to agricultural land use and ownership. It integrates place attachment and self-efficacy as mediators and examines the relationship between farmers' commitment to agricultural land use and their ownership of that land. Structural Equation Modeling (PLS-SEM) was applied to test the proposed hypotheses using survey data collected from 200 rice farmers in Mojolaban Sub-district, Sukoharjo District, Central Java, Indonesia. The results show that institutional trust is the strongest direct predictor of farmers' commitment to agricultural land use ($\beta = 0.555$, $p < 0.001$) and agricultural land ownership ($\beta = 0.217$, $p < 0.001$). Meanwhile, interpersonal trust significantly increases farmers' commitment to agricultural land use through increased self-efficacy. In parallel, interpersonal trust significantly increases farmers' commitment to agricultural land ownership through place attachment. The findings also reveal a strong positive relationship between farmers' commitment to agricultural land use and their commitment to agricultural land ownership ($\beta = 0.671$, $p < 0.001$). These results highlight that institutional and interpersonal trust play distinct but complementary roles in shaping farmers' behavioral commitment. This study contributes to the literature on social capital, specifically the trust dimension, by showing that interpersonal and institutional trust are not interchangeable in the context of rural agricultural environments in Indonesia, Southeast Asia. Policy efforts should therefore focus on strengthening institutional credibility, improving extension services, and reinforcing farmer groups to enhance trust, thereby supporting long-term agricultural sustainability.

Keywords: Agricultural land conversion, institutional trust, interpersonal trust, place attachment, SEM

INTRODUCTION

Indonesia loses tens of thousands of hectares of rice cultivation land annually to non-agricultural uses (Ivanka et al. 2024), threatening food security and economic stability. The agricultural sector contributes about 15% to Indonesia's Gross Domestic Product (GDP) and employs about 40% of the workforce (Ru et al. 2023). Some evidence suggests that this land loss may be associated with weakening farmers' commitment at the individual level (Sudrajat 2016).

In response, the Indonesian government issued Law No. 41/2009 and Government Regulation No. 1/2011 to strengthen farmers' commitment (Prayitno et al. 2021). Recent evidence shows that government policies alone are ineffective in controlling land conversion (Hardanovita et al. 2026), indicating that regulatory approaches must be complemented by addressing farmers' psychological foundations. In the context of sustainable agricultural practices, farmers and related institutions must engage in cooperative behavior (Gao and Feng 2025). Cooperative behavior emerges when there is social trust (Qi and Zhou 2021). Social trust refers to expectations that community members (interpersonal trust) and management institutions (institutional trust) are reliable and honest (Peng et al. 2020).

Interpersonal trust helps farmers collaborate and reduce conflicts (Zagar et al. 2024; May et al. 2025), while a lack of trust in institutions threatens sustainable agricultural initiatives (Ahsan et al. 2021). This highlights that social trust can shape how farmers perceive risks, access information, and build long-term commitment to their land. Despite its recognized importance, previous studies on farmers' land commitment in Indonesia have focused narrowly on economic and policy determinants (e.g., Mutiara et al. 2021), ignoring the psychosocial dimension that explains how these determinants are perceived. In other words, economic and policy factors do not operate in a vacuum. This study fills that gap by introducing social trust as a key explanation for farmers' commitment.

Trust in others within communities and institutions leads to positive emotional bonds with the community (i.e., a place attachment) (Peng et al. 2020), which in turn stimulates sustainable behavior (Prayitno et al. 2021). In

addition, social trust can build farmers' cognitive beliefs in their own capabilities (self-efficacy), with support from fellow farmers (Peng et al. 2020) and assurances from institutions reinforcing their sense of competence in managing land productively (Ridwansyah et al. 2024). Farmers with high self-efficacy are often associated with the wider adoption of sustainable and innovative practices (Han and Niles 2023). Therefore, this study proposes place attachment and self-efficacy as two mediating constructs that are rarely discussed simultaneously. It is important to discuss the factors of trust, attachment, and self-efficacy in the context of rural Indonesia, where community-based development has become a key policy in rural development planning.

To examine how these psychological mechanisms affect farmers' land-related decisions, this study adopts the concept of continuity commitment, which is based on cost-benefit analysis and the perception of the need to maintain an action (Hadi et al. 2024). In the context of agriculture, this concept of commitment can be linked to farmers' commitment to their land. Farmers with high continuity commitment will maintain optimal land use and ownership (Sudrajat 2016).

This study aims to test an integrated model designed to address the policy implementation challenges and research gaps outlined above. This framework is rarely applied in the agricultural context in Indonesia and Southeast Asia. Furthermore, this study aims to contribute to the broader literature on social capital, place attachment, self-efficacy, and the sustainability of agricultural practices. Specifically, the objectives of this study are: (i) to verify the relationship between social trust and farmers' commitment to agricultural land use and ownership, (ii) to develop an integrated model with place attachment and self-efficacy as mediators, and (iii) to verify the relationship between farmers' commitment to agricultural land use and their ownership of that land.

Based on the theoretical framework of social capital and behavioral psychology, this study hypothesizes that social trust influences farmers' commitment to agricultural land through distinct psychological mechanisms. Specifically, institutional trust and interpersonal trust are expected to shape farmers' commitment to agricultural land use and ownership both directly and indirectly through place attachment and self-efficacy. Institutional trust is hypothesized to exert stronger direct effects on farmers' commitment, whereas interpersonal trust is expected to operate primarily through psychological pathways. Furthermore, farmers' commitment to agricultural land use is hypothesized to positively influence their commitment to agricultural land ownership.

MATERIALS AND METHODS

Research design and hypotheses

This study used a quantitative research design with a cross-sectional survey to test the proposed conceptual model (see Figure 1). The following is a study model of the theories and hypotheses listed.

Social trust in farmers' commitment to agricultural land use and ownership

Social trust, encompassing interpersonal trust among farmers and institutional trust in regulatory bodies, underpins agricultural sustainability. Interpersonal trust facilitates knowledge exchange and collaborative practices (Zagar et al. 2024; May et al. 2025), while institutional trust ensures effective policy implementation and support systems (Cao et al. 2020; Scutt et al. 2023). These mechanisms are believed to directly increase farmers' commitment to agricultural land use and ownership. Therefore, this hypothesis is proposed:

H1a. Interpersonal trust has a significant and positive influence on farmers' commitment to agricultural land use.

H1b. Interpersonal trust has a significant and positive influence on farmers' commitment to agricultural land ownership.

H1c. Institutional trust has a significant and positive influence on farmers' commitment to agricultural land use.

H1d. Institutional trust has a significant and positive influence on farmers' commitment to agricultural land ownership.

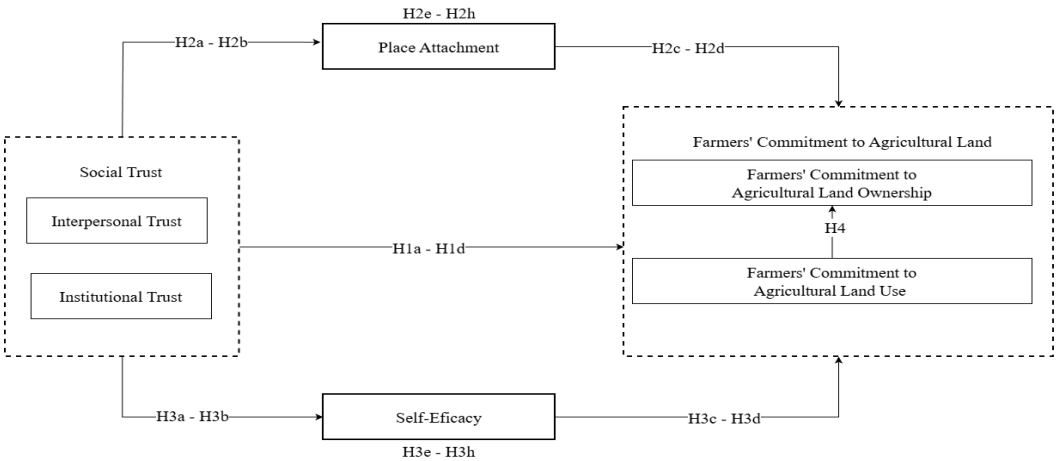

Figure 1. Theoretical and hypothesis framework

The role of place attachment

Social trust is believed to strengthen emotional and functional attachment with the agricultural landscape (Peng et al. 2020). These attachments, in turn, motivate protective behavior towards the agricultural land (Prayitno et al. 2021). Therefore, place attachment is expected to be the main psychological pathway through which social trust strengthens farmers' commitment to agricultural land. Therefore, this hypothesis is proposed:

H2a. Interpersonal trust has a significant and positive influence on place attachment.

H2b. Institutional trust has a significant and positive influence on place attachment.

H2c. Place attachment has a significant and positive influence on farmers' commitment to agricultural land use.

H2d. Place attachment has a significant and positive influence on farmers' commitment to agricultural land ownership.

H2e. Place attachment mediates the relationship between interpersonal trust and farmers' commitment to agricultural land use.

H2f. Place attachment mediates the relationship between interpersonal trust and farmers' commitment to agricultural land ownership.

H2g. Place attachment mediates the relationship between institutional trust and farmers' commitment to agricultural land use.

H2h. Place attachment mediates the relationship between institutional trust and farmers' commitment to agricultural land ownership.

The role of self-efficacy

At the same time, social trust can build farmers' confidence in their abilities. Interpersonal trust enhances self-efficacy by fostering a supportive social environment (Peng et al. 2020). Institutional trust provides knowledge and resources through extension services (Kalogiannidis and Syndoukas 2024), as well as security guarantees, program reliability, technical assistance, and incentives (Ridwansyah et al. 2024). Increased self-efficacy is then associated with greater adoption of sustainable and innovative practices (Han and Niles 2023). Therefore, the following hypotheses are proposed:

H3a. Interpersonal trust has a significant and positive influence on self-efficacy.

H3b. Institutional trust has a significant and positive influence on self-efficacy.

H3c. Self-efficacy has a significant and positive influence on farmers' commitment to agricultural land use.

H3d. Self-efficacy has a significant and positive influence on farmers' commitment to agricultural land ownership.

H3e. Self-efficacy mediates the relationship between interpersonal trust and farmers' commitment to agricultural land use**.**

H3f. Self-efficacy mediates the relationship between interpersonal trust and farmers' commitment to agricultural land ownership**.**

H3g. Self-efficacy mediates the relationship between institutional trust and farmers' commitment to agricultural land use.

H3h. Self-efficacy mediates the relationship between institutional trust and farmers' commitment to agricultural land ownership.

The land use and ownership commitment linkage

Commitment to intensive land use is associated with higher productivity (Arsil et al. 2022), thereby increasing agricultural income and strengthening the economic viability of agriculture (Elisabeth 2022). This economic foundation logically reinforces the intention to maintain land ownership. Therefore, this hypothesis is proposed:

H4. Farmers' commitment to agricultural land use significantly and positively influences their commitment to agricultural land ownership.

Study area

This study was conducted in Mojolaban Sub-district, Sukoharjo District, Central Java Province, Indonesia (Figure 2). Mojolaban Sub-district consists of 15 villages and covers an area of 38.29 km². Based on data from Badan Pusat Statistik (BPS), approximately 2,143 hectares, or 56% of the Mojolaban Sub-district area, are rice fields. This reflects the community's workforce structure, which is highly dependent on the agricultural sector. Agricultural land in urban buffer sub-districts, such as Mojolaban, has low land rent, creating significant potential for landowners to convert it to more economically profitable uses (Fandani and Harini 2020).

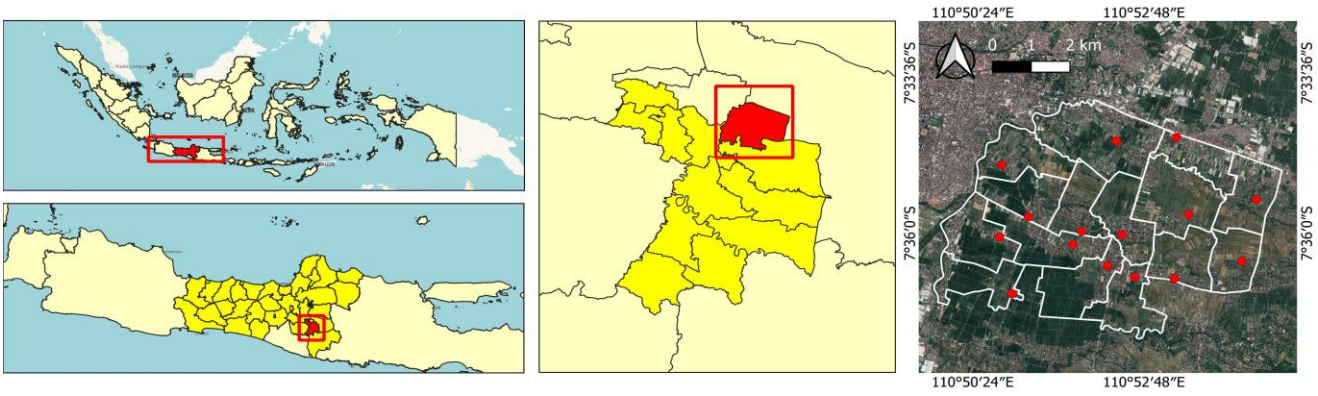

Figure 2. Map of the study area in Mojolaban Sub-district, Sukoharjo District, Central Java, Indonesia

This condition is evident, as Mojolaban Sub-district is among the sub-districts with the most extensive agricultural land conversion (Pradoto et al. 2024). Based on data from Badan Pusat Statistik (BPS), the number of farming households in Mojolaban Sub-district decreased by 90% between 2000 and 2020. The combination of rice field dominance, urban buffer location, land rent disparities, and documented trends of conversion makes Mojolaban a suitable and contextually rich case for examining farmers' commitment to their agricultural land.

Sampling and data collection

The minimum sample size was calculated as 155 using the inverse square root method (Kock and Hadaya 2018) with a significance level of 5% and a minimum path coefficient of 0.2. To ensure sufficient statistical power and reduce bias, a larger sample was collected (Hair et al. 2022). This study employed a purposive sampling approach, targeting agricultural landowners who grow rice and reside in the same village as their agricultural land. Tenant farmers and farmers who do not reside in the same village as their agricultural land were excluded. Although this non-probabilistic sampling strategy may limit external validity due to the absence of random selection, it is suitable for research focused on specific livelihood systems and the context of commitments to sustainable agricultural practices. Consequently, these findings are not intended to statistically represent all rice farmers in Sukoharjo District, Central Java, Indonesia. However, these findings can be analytically generalized to rice farming communities with comparable socioeconomic conditions and policies.

Data was collected from October to December 2024. A total of 200 respondents were interviewed, distributed proportionally across 15 villages (13-14 respondents per village). Ethical considerations were addressed before data collection. Verbal informed consent was obtained from all respondents after providing a clear explanation of the study's objectives, the voluntary nature of participation, the confidentiality of responses, and the right to withdraw at any time.

Survey instruments

The researcher conducted a thorough literature review to identify the most representative indicators for building the model. The questionnaire adapted items from survey instruments used in previous studies and from prior empirical research. All constructs were measured using multi-item scales on a 5-point Likert format (1 = strongly disagree to 5 = strongly agree), supplemented by open-ended questions for qualitative insights. Qualitative responses were thematically analyzed to help interpret quantitative findings, particularly unexpected or non-significant results. Before full implementation, the questionnaire underwent pre-testing with 30 farmers in locations with similar characteristics and criteria to ensure validity and reliability and to refine ambiguous questions. The measures (indicators) used to assess the relevant constructs in this study were tested for internal consistency (Cronbach's α), as shown in Table 1. All the questionnaire items and derivation sources are presented in Table S1.

Analytical approach

This study employs Partial Least Squares Structural Equation Modeling (PLS-SEM) using SmartPLS 4.1.1.2. PLS-SEM was selected because the model involves multiple latent constructs with direct and mediating paths, making it well suited for estimating complex structural relationships. In addition, the integrated framework has not been previously tested in the Indonesian agricultural context, which aligns with PLS-SEM's strength in exploratory research (Dash and Paul 2021). The method also prioritizes predictive relevance, essential for deriving policy implications, and accommodates non-normal data and moderate sample sizes (Hair et al. 2022). The analysis proceeds by first assessing the measurement model to confirm reliability and validity, then evaluating the structural model to determine explanatory power (R^2), effect sizes (F^2), predictive relevance (Q^2), and Goodness of Fit (GoF). Hypotheses were tested using bootstrapping with 5,000 subsamples. All evaluation criteria and thresholds are presented in Table S2.

Table 1. Operational definition of construct

Construct	Definition	Source
Interpersonal Trust (IPT)	Refers to farmers' general expectations regarding the reliability of other farmers in the same farming community	Antonova et al. (2021) and Chen et al. (2021)
Institutional Trust (ITT)	Refers to farmers' expectations of institutions, such as local government and authorities	Peng et al. (2020), Antonova et al. (2021), Chen et al. (2021) and OECD (2024)
Place Attachment (PA)	Refers to the emotional connection between individual farmers and their agricultural land and landscape	Prayitno et al. (2021) and Murillo-López et al. (2022)
Self-Efficacy (SE)	Refers to farmers' confidence in their ability to implement, maintain, and develop agricultural practices successfully	Josan et al. (2024)
Farmers' Commitment to Agricultural Land Use (FCL)	Refers to farmers' wholehearted actions in optimizing the productive and sustainable use of agricultural land	Sudrajat (2016)
Farmers' Commitment to Agricultural Land Ownership (FCO)	Refers to farmers' wholehearted efforts to maintain ownership of agricultural land, avoiding conversion and takeover by other parties	Sudrajat (2016)

RESULTS AND DISCUSSION

Respondent characteristics

Table 2 shows the socioeconomic profile of rice farmers in Mojolaban Sub-district. The sample was predominantly male, reflecting the typical gender composition in Indonesian smallholder farming (Quisumbing and Doss 2021). Most farmers were in the 30 to 60 years age group, while only a small fraction were under 30 years old. This age structure is consistent with previous findings that highlight aging trends in agricultural labor in developing agrarian contexts (Akdemir et al. 2021). Educational attainment among respondents was generally low. Most farmers had completed elementary or senior high school and only a small proportion were pursuing higher education.

Landholdings were predominantly small, confirming the characteristics of smallholder agriculture in rural Indonesia (Saleh et al. 2021). Farming experience was extensive, as the majority of respondents reported more than 20 years of experience, suggesting deep local knowledge and long-term dependence on rice cultivation (Skendžić et al. 2021). These characteristics provide essential context for interpreting the subsequent analysis. Generalization of our findings is therefore most appropriate to similar smallholder farming contexts.

Outer model analysis

Convergent validity

A high composite reliability value indicates that the indicators are suitable for measuring the same latent variable. In this study, composite reliability values ranged from 0.917 to 0.955, which exceeded the threshold of 0.70 (Hair et al. 2022). Factor loadings are essentially correlation coefficients between latent variables and their manifest variables, distributed between 0.749 and 0.945 and above the threshold of 0.70 (Hair et al. 2022), thereby validating the manifest variables. Additionally, Cronbach's alpha ranged from 0.887 to 0.933 and exceeded the 0.70 threshold (Hair et al. 2022). Furthermore, all AVE values in this analysis exceeded 0.50 (Hair et al. 2022), confirming their validity. These results collectively confirm the measurement model's robustness for subsequent analysis (see Table 3).

Discriminant validity

Discriminant validity determines the extent to which a construct is empirically different from constructs in the path model. The discriminant validity test shows that the square root of the average variance extracted (the bold diagonal values in Table 4) for each construct is higher than the estimated correlations with other constructs, indicating good discriminant validity. Additionally, other criteria in Table S3 show that all cross-loadings exceed 0.70 (Hair et al. 2022). When connected to its own latent variable, each item has a higher value than when connected to a separate latent variable. It illustrates how each research variable has effectively clarified the underlying variable and supported the item's overall discriminant validity.

Inner model analysis

F-square (F^2)

The effect size F^2 specifically measures the practical relevance of a predictor by measuring the exogenous effect on the endogenous variable, or the influence between constructs in the model. According to established guidelines (Table S2), F^2 values of 0.02, 0.15, and 0.35 correspond to small, medium, and large effects, respectively (Hair et al. 2022). Therefore, predictors with significant path coefficients and $F^2 \geq 0.02$ can be considered meaningful contributors to the model. Farmers' commitment to agricultural land use significantly affects their commitment to agricultural land ownership, with this relationship representing the strongest in the model (Table 5). Institutional trust emerged as a strong predictor, particularly for farmers' commitment to agricultural land use, while showing a more moderate effect on other constructs.

The influence of interpersonal trust varies significantly across different constructs. Although it shows limited direct effects on both commitment variables, interpersonal trust has a strong effect on psychological factors, particularly place attachment, and a moderate effect on self-efficacy. Both place attachment and self-efficacy show relatively smaller effect sizes on both commitment variables, indicating their role as important but secondary influences compared to more substantial direct effects, such as institutional trust.

SmartPLS does not output the F-square (F^2) in the mediation relationship. The effect sizes of the mediation effects can be assessed by calculating the upsilon value using the formula $(v) = (\beta_{MX})^2 \cdot (\beta_{YM \cdot X})^2$ (Lachowicz et al. 2018). An analysis revealed that the mediating effects of place attachment and self-efficacy in the relationships between social trust and farmers' commitment to agricultural land use and ownership were small, ranging from 0.001 to 0.006. We therefore describe them as weak mediation effects.

Table 2. Characteristics of farmer respondents in Mojolaban Sub-district, Sukoharjo, Central Java, Indonesia

Characteristic		∑	%
Gender	Male	152	76
	Female	48	24
Age (year)	<30	35	17.5
	30-60	117	58.5
	>60	4	24
Education	No education	11	5.5
	Elementary School	98	49
	Junior High School	44	22
	Senior High School	26	13
	Diploma	12	6
	Bachelor's Degree	9	4.5
Area of agricultural land (hectares)	<0.5	19	9.5
	0.5-1	167	83.5
	>1	14	7
Experience (years)	<10	23	11.5
	10-20	38	19
	>20	139	69.5

Several factors may account for the magnitude of these effects, including the limited sample size and the inclusion of multiple mediators (Walters 2019). However, it is crucial to emphasize that the observed effect sizes should not be interpreted as indicative of limited importance or real-world significance (Greenwald et al. 2015). To further validate and potentially extend these findings, future research should replicate the study with a larger sample to enhance statistical power.

R-Square (R^2)

R-squared (R^2) analysis quantifies the proportion of variation in each endogenous construct explained by its predictor variables. As shown in Table 6, our study meets the R^2 requirement. The R^2 value for place attachment is 0.548, indicating that social trust explains 54.8% of the variance, signifying a moderate impact. Furthermore, self-efficacy has an R^2 of 0.424, indicating that 42.4% of the variance is predicted by social trust, with a relatively weak impact.

Table 3. Convergent validity result

Construct	Indicator	Factor loading	AVE	CR	CA
IPT	IPT1	0.796	0.688	0.917	0.887
	IPT2	0.797			
	IPT3	0.840			
	IPT4	0.863			
	IPT5	0.847			
ITT	ITT1	0.877	0.716	0.946	0.933
	ITT2	0.749			
	ITT3	0.833			
	ITT4	0.882			
	ITT5	0.869			
	ITT6	0.831			
	ITT7	0.875			
PA	PA1	0.848	0.741	0.945	0.930
	PA2	0.804			
	PA3	0.906			
	PA4	0.810			
	PA5	0.895			
	PA6	0.897			
SE	SE1	0.862	0.742	0.945	0.930
	SE2	0.795			
	SE3	0.890			
	SE4	0.911			
	SE5	0.850			
	SE6	0.857			
FCL	FCL1	0.945	0.877	0.946	0.930
	FCL2	0.927			
	FCL3	0.937			
FCO	FCO1	0.914	0.854	0.955	0.915
	FCO2	0.922			
	FCO3	0.936			

Note: AVE: Average variance extracted, CR: Composite reliability, CA: Cronbach's alpha, IPT: Interpersonal trust, ITT: Institutional trust, PA: Place attachment, SE: Self-efficacy, FCL: Farmers' commitment to agricultural land use, FCO: Farmers' commitment to agricultural land ownership

Meanwhile, farmers' commitment to agricultural land use achieved an R^2 value of 0.664. This indicates that 66.4% of the variation in farmers' commitment to agricultural land use is simultaneously explained by social trust, place attachment, and self-efficacy, suggesting moderate predictive power. Most notably, farmers' commitment to agricultural land ownership showed the highest R^2 value, at 0.819. This value indicates that 81.9% of the variance is explained by all predictors in the model, suggesting a strong impact. All dependent variables have high R^2 values and meet the minimum threshold of 0.10 (Hair et al. 2022). This indicates that the model explains the variation in the dependent variables, demonstrating strong explanatory power.

Q-square (Q^2)

Q-Square (Q^2) measures how well the model predicts the original data. The model in this study shows significant predictive relevance across all endogenous constructs, with all Q^2 values exceeding the minimum threshold of $Q^2 > 0$ (Hair et al. 2022). As shown in Table 6, the psychological constructs of place attachment and self-efficacy show moderate predictive power, confirming that social trust dimensions are meaningful predictors of these intermediary variables. More significantly, farmers' commitment to agricultural land use shows substantial predictive power, driven by the combined influence of social trust and psychological factors. Farmers' commitment to agricultural land ownership shows the highest predictive relevance, indicating that the full set of predictor variables provides robust predictive power for this outcome.

Table 4. Discriminant validity result: Fornell-Larcker criterion

Construct	FCL	FCO	ITT	IPT	PA	SE
FCL	0.936					
FCO	0.886	0.924				
ITT	0.764	0.774	0.846			
IPT	0.509	0.491	0.411	0.829		
PA	0.638	0.649	0.568	0.666	0.861	
SE	0.618	0.564	0.547	0.547	0.707	0.861

Note: IPT: Interpersonal trust, ITT: Institutional trust, PA: Place attachment, SE: Self-efficacy, FCL: Farmers' commitment to agricultural land use, FCO: Farmers' commitment to agricultural land ownership

Table 5. F-square (F^2) result

Construct	IPT	ITT	PA	SE	FCL	FCO
IPT			0.498	0.217	0.015	0.000
ITT			0.230	0.217	0.583	0.104
PA					0.023	0.045
SE					0.034	0.015
FCL						0.832
FCO						

Note: IPT: Interpersonal trust, ITT: Institutional trust, PA: Place attachment, SE: Self-efficacy, FCL: Farmers' commitment to agricultural land use, FCO: Farmers' commitment to agricultural land ownership

Goodness of fit (GoF)

Standardized Root Mean Square Residual (SRMR) is a measure of model fit that quantifies the difference between the covariance or correlation matrix estimated from empirical data and the one predicted by the model. In other words, SRMR measures the extent to which the hypothesized model fits the actual data. As shown in Table 6, the model's Goodness-of-Fit test yields an SRMR of 0.091, which falls within the 0.10 threshold (Schermelleh-Engel et al. 2003). Consequently, this substantiates the model's robustness.

Hypothesis testing

The bootstrapping method (5000 subsamples) was used for hypothesis testing in the PLS-SEM model. Hypothesis testing was conducted on a total of 21 relationships, both direct and indirect. The analysis results indicate that 12 of the 21 relationships (H1c, H1d, H2a, H2b, H2d, H3a, H3b, H3c, H4, H2f, H2h, H3e) were statistically significant (see Table 6 and Figure 3).

Direct effect

The analysis of direct impacts shows a clear dominance of institutional trust mechanisms over interpersonal trust in shaping farmers' commitment to their agricultural land (see Table 6). Although interpersonal trust does not have a significant direct effect on farmers' commitment to agricultural land use or ownership, institutional trust is a significant driver of both. This fundamental finding highlights that farmers' commitment to their agricultural land is more closely related to their trust in the institutional system than to relationships within their community. The psychological dimensions of place attachment and self-efficacy show different roles. Social trust significantly strengthens farmers' place attachment. However, this attachment is only translated into a stronger commitment to agricultural land ownership, not into a greater commitment to agricultural land use. Similarly, although social trust increases farmers' confidence in their abilities, this increase in self-efficacy only encourages more commitment to agricultural land use without affecting commitment to agricultural land ownership. Another important finding relates to the relationship between the two types of commitment. Farmers' commitment to agricultural land use significantly strengthens farmers' commitment to agricultural land ownership, indicating a functional pathway to security of tenure through agricultural productivity.

Indirect effect

Mediation analysis reveals complex psychological pathways that explain how social trust influences farmers' commitment (see Table 6). Place attachment functions as a key mechanism through which interpersonal trust influences farmers' commitment to agricultural land ownership. Although interpersonal trust does not directly influence farmers' commitment to agricultural land ownership, it builds emotional ties to agricultural land and its landscape, ultimately strengthening that commitment. For institutional trust, place attachment serves as a complementary pathway that partially explains its impact on farmers' commitment to agricultural land ownership.

Self-efficacy plays a distinct mediating role, specifically by transforming interpersonal trust into greater commitment to agricultural land use. Interpersonal trust supports their belief in more intensive land use, whereas institutional trust directly influences farmers' commitment to agricultural land use, independent of self-efficacy. It should be noted that no mediating effects were identified for farmers' commitment to agricultural land use through place attachment, or for farmers' commitment to agricultural land ownership through self-efficacy, as preliminary tests showed no significant direct relationships between these variables.

Discussion

The present study examined the influence of social trust (interpersonal and institutional trust) on farmers' commitment to agricultural land use and ownership. We then incorporated place attachment and self-efficacy as mediators to understand farmers' commitment. The main findings can be summarized as follows.

It should be noted that interpersonal trust does not have a significant effect on farmers' commitment to agricultural land use and ownership. Previous research indicates that interpersonal trust facilitates the exchange of knowledge and collaborative practices among farmers (Zagar et al. 2024; May et al. 2025). This suggests that while such trust may facilitate routine collaboration, it does not automatically imply a long-term commitment to land use or ownership among farmers in the Mojolaban Sub-district. This finding aligns with the distinction between bonding and linking social capital in Michael Woolcock's Social Capital Theory. Bonding social capital, such as interpersonal trust, provides direct emotional and instrumental support but is less effective at addressing more complex structural challenges in homogeneous environments (Datoon et al. 2023).

Another possible explanation is that interpersonal relationships tend to form naturally within homogeneous communities, and the "*sambat-sinambat*" culture is quite strong in rural Indonesian society. The term "*sambat sinambat*" refers to a family-based tradition of mutual assistance in which individuals ask for help, and the community responds voluntarily without pay to maintain harmony and ease others' burdens. This situation fosters relationships that are reactive to daily needs rather than proactive for long-term sustainability (Datoon et al. 2023).

As expected, institutional trust is a salient driver of farmers' commitment to agricultural land use and ownership. These findings are consistent with studies in Southeast and East Asia that show trust in government institutions supports policy effectiveness and agricultural stability (Laiprakobsup 2019; Cao et al. 2020; Cong 2022). Farmers in Indonesia perceive institutions as vital for ensuring access to inputs, technical assistance, and safety nets like crop insurance (Isnan et al. 2025).

Table 6. Path analysis result

Path	Hypothesis	Path coefficient	p-value	Decision
Direct Effect				
IPT → FCL	H1a	0.097	0.088^{ns}	Rejected
IPT → FCO	H1b	0.002	0.944^{ns}	Rejected
ITT → FCL	H1c	0.555	0.000*	Supported
ITT → FCO	H1d	0.217	0.000*	Supported
IPT → PA	H2a	0.521	0.000*	Supported
ITT → PA	H2b	0.354	0.000*	Supported
PA → FCL	H2c	0.154	0.093^{ns}	Rejected
PA → FCO	H2d	0.152	0.004*	Supported
IPT → SE	H3a	0.388	0.000*	Supported
ITT → SE	H3b	0.388	0.000*	Supported
SE → FCL	H3c	0.158	0.025*	Supported
SE → FCO	H3d	-0.079	0.068^{ns}	Rejected
FCL→ FCO	H4	0.671	0.000*	Supported
Mediation Effect				
IPT → PA → FCL	H2e	0.076	0.103^{ns}	Rejected
IPT → PA → FCO	H2f	0.079	0.012*	Supported
ITT → PA → FCL	H2g	0.052	0.129^{ns}	Rejected
ITT → PA → FCO	H2h	0.054	0.008*	Supported
IPT → SE → FCL	H3e	0.061	0.049*	Supported
IPT → SE → FCO	H3f	-0.031	0.080^{ns}	Rejected
ITT → SE → FCL	H3g	0.061	0.070^{ns}	Rejected
ITT → SE → FCO	H3h	-0.031	0.098^{ns}	Rejected
R-Square (R^2)	$R^2_{PA} = 0.548$; $R^2_{SE} = 0.424$; $R^2_{FCL} = 0.664$; $R^2_{FCO} = 0.819$			
Q- Square (Q^2)	$Q^2_{PA} = 0.529$; $Q^2_{SE} = 0.438$; $Q^2_{FCL} = 0.619$; $Q^2_{FCO} = 0.626$			
GoF (SRMR)	0.091			

Note: IPT: Interpersonal trust, ITT: Institutional trust, PA: Place attachment, SE: Self-efficacy, FCL: Farmers' commitment to agricultural land use, FCO: Farmers' commitment to agricultural land ownership, *: 5% significance level, ns: Not significant

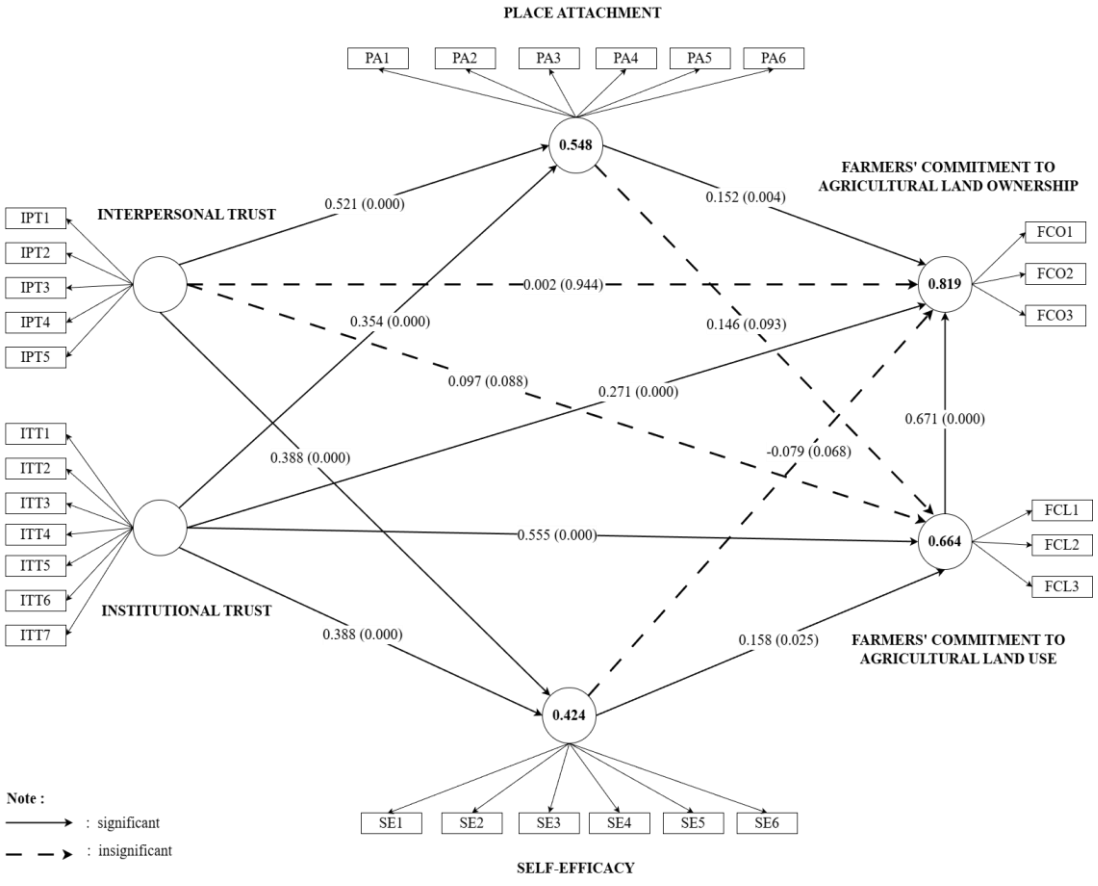

Figure 3. Structural model result from PLS-SEM bootstrapping analysis showing standardized path coefficient

Technical support from institutions has been shown to enhance agricultural stability (Kardiyono et al. 2021). Furthermore, levels of institutional trust enable farmers to comply with regulations, such as the prohibition on land-use conversion in sustainable agricultural areas. Farmers are more likely to comply with regulations if they believe the rules are fair and have clear benefits and consequences (Scutt et al. 2023).

These findings also contribute to the social capital literature by demonstrating that institutional and interpersonal trust are not interchangeable in rural agricultural settings. Trust in institutional programs (e.g., agricultural insurance) psychologically removes this cost from farmers' calculations, allowing them to make greater, riskier commitments (Bharne et al. 2025). Trust in institutions has been shown to strengthen farmers' intention to purchase agricultural insurance (Chen et al. 2025).

The mediating role of place attachment has been partially verified. First, there is a significant relationship between social trust and place attachment. These findings support the research by Peng et al. (2020), which found that positive expectations towards other people and institutions in a community enhance cohesiveness, identification, interpersonal harmony, and place identity, leading to higher place attachment. Second, our findings indicate that place attachment significantly enhances farmers' commitment to agricultural land ownership but does not significantly affect their commitment to agricultural land use. These results align with Prayitno et al. (2021), who found that place attachment underpins farmers' commitment to maintaining agricultural land ownership. Another interpretation is that most farmers acquire agricultural land through inheritance. Agricultural land passed down through generations becomes part of the family's identity and culture, thereby strengthening farmers' attachment and commitment to their land (Fernando 2022).

At first glance, our results appear to contradict the findings of Wang et al. (2021), who found that place attachment is a significant driver of the adoption of sustainable agricultural practices among Chinese farmers. However, this discrepancy likely stems from conceptual and operational differences. Wang et al. (2021) measured specific sustainable agricultural practices in the adoption of organic fertilizers. In contrast, our study measures farmers' commitment to agricultural land use as a more holistic behavioral construct. Place attachment has been shown to drive the adoption of specific pro-environmental practices, such as organic fertilisation (Wang et al. 2021). However, based on our findings, place attachment appears to play a less significant role in routine land use commitment, where socioeconomic and agronomic factors are likely more influential.

Third, we found that place attachment mediates the relationship between social trust and farmers' commitment to agricultural land ownership. Consistent with the findings of Peng et al. (2020), interpersonal and institutional trust positively influence place attachment. Place attachment, in turn, enhances commitment to ownership (Prayitno et al. 2021). In the relationship between institutional trust and ownership commitment, place attachment acts as a partial mediator. This implies that the significance of the relationship between institutional trust and commitment to ownership can be partially explained through place attachment. These findings suggest that institutions should adopt holistic strategies and encourage inclusive participation from farmers. Evidence suggests that these factors can foster place attachment (e.g., Tsoriyo 2024). It should be noted that no mediating effect of place attachment was found in the relationship between social trust and farmers' commitment to agricultural land use.

The mediating role of self-efficacy was partially verified. First, there is a significant relationship between social trust and self-efficacy. This finding aligns with a study by Peng et al. (2020), which found that interpersonal trust can enhance self-efficacy by fostering a supportive social environment for collaboration, resource exchange, and knowledge sharing. On the other hand, institutional trust contributes by providing security guarantees, program reliability, technical assistance, and incentives (Ridwansyah et al. 2024). Second, self-efficacy significantly increases farmers' commitment to agricultural land use. In line with Han and Niles (2023), high self-efficacy encourages the adoption of innovative and sustainable agricultural practices.

It should be noted that the relationship between self-efficacy and farmers' commitment to agricultural land ownership is negative. A possible explanation is that farmers with high self-efficacy tend to weigh the costs and benefits when choosing sustainable practices, especially in unsupportive environments. Self-efficacy has been shown to influence an individual's ability to make decisions through strategic thinking (Ishak et al. 2024). In supportive environments, self-efficacy may foster greater commitment to agricultural land ownership. Conversely, in unsupportive environments, the same self-efficacy may lead farmers to make rational decisions that tend to prioritize short-term liquidity.

Third, self-efficacy selectively mediates the relationship between social trust and farmers' commitment. Self-efficacy fully mediates the relationship between interpersonal trust and commitment to agricultural land use. These results imply that although interpersonal trust does not directly drive farmers' commitment to agricultural land use, it can indirectly influence it by strengthening self-efficacy. We found that self-efficacy does not mediate the relationship between institutional trust and land-use commitment. A possible reason is that institutional trust can directly shape farmers' commitment to agricultural land use by fostering a sense of security. Consequently, this can directly and strongly shape farmers' perceptions of the sustainability of their agricultural practices rather than through increased self-efficacy. It should be noted that no mediating effect of self-efficacy was found in the relationship between social trust and farmers' commitment to agricultural land ownership.

Last, we also found that commitment to agricultural land use has a significant direct effect on commitment to agricultural land ownership. A high level of commitment to land use results in higher production output (Arsil et al. 2022). Increased agricultural productivity means farmers

earn higher incomes, which in turn encourages them to remain in the agricultural sector (Elisabeth 2022). These findings align with Indonesia's System of Rice Intensification (SRI) policy. The primary objective of the SRI policy is to increase rice productivity while promoting sustainable, environmentally friendly agriculture (Arsil et al. 2022).

In conclusion, this study highlights the crucial role of social trust in increasing farmers' commitment to agricultural land use and ownership in Mojolaban Sub-district, Indonesia. The results of the PLS-SEM analysis show that institutional trust is the strongest direct predictor of farmers' commitment to agricultural land use ($\beta = 0.555$, $p < 0.001$) and agricultural land ownership ($\beta = 0.217$, $p < 0.001$). In contrast, interpersonal trust does not directly influence commitment to land use ($\beta = 0.097$, $p = 0.088$) or ownership ($\beta = 0.002$, $p = 0.944$). Instead, interpersonal trust operates through psychological pathways. Self-efficacy significantly increases farmers' commitment to agricultural land use ($\beta = 0.158$, $p = 0.025$), while place attachment significantly strengthens farmers' commitment to agricultural land ownership ($\beta = 0.152$, $p = 0.004$). In addition, a strong positive relationship was identified between farmers' commitment to agricultural land use and their commitment to agricultural land ownership ($\beta = 0.671$, $p < 0.001$). The model also shows substantial explanatory power, with R^2 values of 0.664 for land-use commitment and 0.819 for land-ownership commitment. While the role of social trust may vary across cultural contexts, our findings should be interpreted with attention to local nuances and practices.

This study contributes to the literature on social capital by identifying that the two forms of trust are not interchangeable in the context of agricultural sustainability in Indonesia, Southeast Asia. In parallel, these findings expand the literature on farmer behavior based on perceived costs and benefits, particularly in the agricultural sector of developing countries. By integrating social trust, place attachment, and self-efficacy, this study provides a previously unexplored theoretical framework for explaining how internal and environmental factors shape farmer behavior.

From a policy perspective, a multi-stakeholder approach is needed. Policies should strengthen institutional trust through improved access to credit, agricultural insurance, and responsive farmer support. The role of farmer groups should also be reinforced to enhance cooperation and bargaining power. In addition, extension and training programs can increase farmers' self-efficacy, while place attachment may support intergenerational transfer of agricultural land and practices. Finally, productivity-oriented support such as improved seed subsidies, shared infrastructure, and modern agricultural technologies can help reinforce farmers' commitment to maintaining agricultural land.

This study has several limitations. First, the research was conducted in a single district, which may limit the generalizability of the findings to other regions. Second, the study focused only on trust as a component of social capital. Future research should replicate this study across diverse regions, explore other dimensions of social capital, such as social networks and norms, employ longitudinal designs to observe the evolution of these constructs over time, particularly following policy interventions and improve sampling by using proportional stratified sampling. Despite its limitations, this study provides an empirical framework for the sustainability and development of sustainable agriculture in Indonesia and Southeast Asia.

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Table S1. Questionnaire items

Construct	Indicator	Source	Items
IPT	IPT1	Antonova et al. (2021) and Chen et al. (2021)	You often interact with other farmers in your community.
	IPT2		You trust other farmers in your community to share information about farming practices.
	IPT3		You are willing to share your farming experience and knowledge with other farmers in your community.
	IPT4		You often ask other farmers in your community for advice on farming practices.
	IPT5		You are willing to collaborate with other farmers in your community in agricultural practices.
ITT	ITT1	Peng et al. (2020), Antonova et al. (2021), Chen et al. (2021) and OECD (2024)	You trust agricultural extension services to provide reliable information.
	ITT2		You often attend extension sessions/training/workshops organized by the local agricultural institution.
	ITT3		You trust the local agricultural institution to act in the interests of farmers.
	ITT4		You are satisfied with the support/policies/and incentives provided by the local agricultural institution.
	ITT5		You believe local agricultural institutions will protect farming communities in emergencies or vulnerable situations.
	ITT6		You believe that local agricultural institutions formulate policies based on facts and conditions in the field.
	ITT7		You believe that the government modifies policies after receiving feedback from farmers.
PA	PA1	Prayitno et al. (2021) and Murillo-López et al. (2022)	You feel that your agricultural land reflects who you are.
	PA2		You feel emotionally connected to your agricultural land and the surrounding landscape.
	PA3		You feel that the historical background of agriculture and traditional agricultural land is important to your identity.
	PA4		You feel it would be difficult to find another piece of land that provides the same benefits.
	PA5		You feel that agricultural land is significant to your family's well-being.
	PA6		You believe that you would face significant challenges if you were to lose access to your agricultural land.
SE	SE1	Josan et al. (2024)	You feel confident that you can carry out and succeed in agricultural practices.
	SE2		You view every difficulty in agricultural practices as a challenge rather than a burden.
	SE3		You persevere when faced with difficulties in agricultural practices.
	SE4		You use failures in agricultural practices as motivation and learning opportunities.
	SE5		You always set plans for every agricultural practice.
	SE6		You always try to innovate in agricultural practices.
FCL	FCL1	Sudrajat (2016)	You continuously use agricultural land, ensuring no land is left unused.
	FCL2		You always prepare agricultural land before and during the planting season.
	FCL3		You constantly strive to maintain and care for agricultural land and supporting infrastructure for agricultural practices.
FCO	FCO1		You always resist the urge to sell the agricultural land you own.
	FCO2		You always resist the urge to lease agricultural land that will be used for non-agricultural purposes.
	FCO3		You always resist the urge to convert rice fields into non-agricultural land.

Note: IPT: Interpersonal trust, ITT: Institutional trust, PA: Place attachment, SE: Self-efficacy, FCL: Farmers' commitment to agricultural land use, FCO: Farmers' commitment to agricultural land ownership

Table S2. Limits are used to evaluate the measurement and structural models in the PLS-SEM

Criteria	Threshold	Source
Factor Loading	>0.70	(Hair et al. 2022)
Cronbach's Alpha (CA)	>0.70	(Hair et al. 2022)
Composite Reliability (CR)	>0.70	(Hair et al. 2022)
Convergent Validity	AVE > 0.50	(Hair et al. 2022)
Discriminant Validity	Fornell lacker criteria > 0.70 Cross-loading criteria > indicator's loading on its own construct should be higher than its loading on any other construct in the model.	(Hair et al. 2022)
F-Square (F^2)	0.02 (small), 0.15 (medium), 0.35 (large)	(Hair et al. 2022)
R-Square (R^2)	$R^2 > 0.10$	(Hair et al. 2022)
Q- Square (Q^2)	$Q^2>0$ (the model has predictive relevance)	(Hair et al. 2022)
SRMR	<0.10	(Schermelleh-Engel et al. 2003)
Path Analysis	t-statistics ≥1.96 and p-value ≤ 0.05	(Hair et al. 2022)

Table S3. Discriminant validity result: Cross-loading criterion

Items	FCL	FCO	ITT	IPT	PA	SE
FCL1	0.945	0.840	0.749	0.518	0.600	0.581
FCL2	0.927	0.821	0.705	0.409	0.583	0.566
FCL3	0.937	0.829	0.692	0.501	0.608	0.590
FCO1	0.835	0.914	0.716	0.499	0.646	0.563
FCO2	0.795	0.922	0.711	0.433	0.585	0.506
FCO3	0.827	0.936	0.719	0.428	0.568	0.493
IPT1	0.377	0.388	0.288	0.796	0.528	0.409
IPT2	0.351	0.357	0.279	0.797	0.446	0.332
IPT3	0.430	0.413	0.344	0.840	0.547	0.471
IPT4	0.499	0.506	0.445	0.863	0.603	0.517
IPT5	0.429	0.355	0.322	0.847	0.612	0.505
ITT1	0.724	0.731	0.877	0.446	0.606	0.516
ITT2	0.635	0.577	0.749	0.402	0.587	0.530
ITT3	0.614	0.612	0.833	0.346	0.410	0.417
ITT4	0.640	0.675	0.882	0.248	0.359	0.382
ITT5	0.614	0.684	0.869	0.302	0.417	0.437
ITT6	0.635	0.657	0.831	0.325	0.440	0.434
ITT7	0.644	0.636	0.875	0.336	0.501	0.502
PA1	0.578	0.568	0.514	0.626	0.848	0.643
PA2	0.438	0.400	0.344	0.511	0.804	0.611
PA3	0.598	0.596	0.555	0.652	0.906	0.682
PA4	0.551	0.577	0.484	0.492	0.810	0.461
PA5	0.527	0.571	0.501	0.585	0.895	0.607
PA6	0.579	0.611	0.502	0.558	0.897	0.643
SE1	0.470	0.446	0.465	0.469	0.608	0.862
SE2	0.559	0.575	0.544	0.446	0.564	0.795
SE3	0.609	0.537	0.490	0.492	0.604	0.890
SE4	0.513	0.512	0.501	0.535	0.662	0.911
SE5	0.527	0.449	0.466	0.446	0.606	0.850
SE6	0.496	0.350	0.324	0.424	0.609	0.857

Note: IPT: Interpersonal trust, ITT: Institutional trust, PA: Place attachment, SE: Self-efficacy, FCL: Farmers' commitment to agricultural land use, FCO: Farmers' commitment to agricultural land ownership