



# An Analysis of Credit Accessibility and Its Determinants Among Horticulturists

## *Evidence from a Structural Equation Modelling Approach*

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### ABSTRACT

*This paper explores the factors of credit availability of horticulturists from Structural Equation Modelling (SEM) based on the data on 500 horticulturists from Shimla, Kullu and Kinnaur districts of Himachal Pradesh. The four hypotheses that have been tested in this study are socio-economic factors, institutional factors, financial literacy and awareness, and collateral and risk perception as influencing factors for access to credit. Findings show that the institutional quality, financial knowledge and socio-economic strength have a significant positive effect on credit access, and collateral and risk perception have a negative effect on credit access. The SEM model showed high reliability, validity, and a good fit. The findings indicate that there is a need to reform the policy in order to make the processes of loans, institutional responsiveness, and financial education more efficient. The study is both theoretical and practical in that it provides an overall structure on the financial inclusion of the horticulturists and on the strategies to be followed in the future for the sustainable rural credit system in India.*

**Keywords:** Credit Accessibility, Horticulturists, Financial Literacy, Institutional Factors, Collateral and Risk Perception, Structural Equation Modelling (SEM), Himachal Pradesh

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### INTRODUCTION

Horticulture strengthens rural livelihoods by creating jobs, diversifying income, and improving nutrition. It has become a key growth sector for small and marginal farmers, especially in hilly regions with fragmented landholdings (Hasbiy & Hardana, 2024; Muli et al., 2023). However, horticulture is an intensive capital-driven business which has to invest in inputs, irrigation, packaging and cold storage always. On time and sufficient credit is important to maintain productivity and profitability (Mariyono, 2019; Wulandari et al., 2017). This notwithstanding, formal credit is not readily available to many horticulturists in developing economies. To mitigate risk, risk-averse lenders usually limit access to borrowing by their outreach, time-consuming processes, and collateral

requirements (Mehta, 2023; Dey et al., 2023). Therefore, others use informal loans, which, although available, put financial strains on them because of high-interest rates (Ullah et al., 2024; Adesiyani and Kehinde, 2024). Access to agricultural finance depends on socio-economic conditions, institutional efficiency, financial literacy, and risk perception (Adams, 2015; Tonui, 2017), which collectively shape borrowing behaviour and satisfaction. Socio-economic factors such as age, education, income and experience affect credit demand and repayment (Hasbiy & Hardana, 2024). Institutional components, such as proximity to a bank, transparency, and rules regarding collateral, also influence access (Wei & Zhang, 2025; Dey et al., 2023). Limited financial literacy and poor awareness discourage formal borrowing (Abid et al., 2020; Purohit, Chopra, & Dangwal, 2022), and behavioural

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elements such as trust and risk perception create more hurdles (Şengül, 2025; Sarma et al., 2025). Together, these dimensions form the structure of credit accessibility between horticulturists.

Although a number of research have been conducted on agricultural credit in general (Kundu & Das, 2021; Muli, 2024), efforts with respect to horticulture have been approached from an integrated perspective. Traditional regressions cannot capture indirect or mediating effects between socio-economic, institutional and psychological factors. Structural Equation Modelling (SEM) offers a more comprehensive approach by analysing latent constructs and their interrelations (Abid et al., 2020; Wang et al., 2021). SEM-based studies have explained farmer intentions in credit use, technology adoption, and investment behaviour (Biswas & Sarkar, 2023; Gnanasanjevi et al., 2025; Ebrahimi et al., 2023), yet their application to horticultural finance remains limited. In Himachal Pradesh, where rural livelihoods are based on horticulture, there is poor growth due to poor financial connections. The farmers are on their own or relying on informal or self-financing, restricting the modernisation as well as market responsiveness (Mehta, 2023; Wulandari et al., 2017). It is therefore important to find out what dictates access to credit to enhance financial inclusion and institutional lending. This study investigates the multidimensional factors influencing horticulturists' access to credit using primary data and Structural Equation Modelling (SEM) in AMOS. The goals of the specific research are:

- **RO1:** To examine the socio-economic and demographic factors influencing credit accessibility among horticulturists.
- **RO2:** To analyse the impact of institutional characteristics—such as procedural ease, collateral norms, and proximity—on access to formal credit.
- **RO3:** To assess the role of financial literacy and awareness in enhancing credit participation and repayment confidence.
- **RO4:** To evaluate the influence of collateral constraints and risk perception on farmers' borrowing behaviour and credit accessibility.

By fulfilling these aims, the research paper will add to the current literature base of the issue of agricultural finance by providing the integrated perspective of the credit ecology of the horticulture sector. The results

will probably be instrumental in assisting policy makers, financial institutions, and rural development agencies in crafting special interventions to simplify the credit procedures, enhance financial literacy and guarantee comprehensive provision of credit. This way, this research will empirically demonstrate how the socio-economic, institutional and perceptual factors interplay in determining the financial behaviour of horticulturists, thereby sealing the existing gap between credit policy frameworks and the real situation in the field (Adesiyani and Kehinde, 2024; Dey et al., 2023; Wang et al., 2021).

## LITERATURE REVIEW, THEORETICAL BACKGROUND AND HYPOTHESES DEVELOPMENT

### Socio-Economic Factors and Credit Accessibility

Socio-economic factors are important determinants of the farmers' participation in the formal credit markets. The variables that influence the credit demand and repayment ability are age, education, agricultural experience, size of land and level of income. In this context, Adams (2015) asserted that education played a positive role in the financial literacy and risk-taking ability of the peri-urban vegetable farmers in enhancing their level of access to microcredit. Besides that, Hasbiy and Hardana (2024) have discovered that socio-economic features played a positive role in determining the involvement of the horticultural farmers at microfinance institutions in East Java, where higher education and income were significantly related to loan eligibility and trust in loan dogging. Muli et al. (2023) also established that accessibility of irrigation and increased landholdings by farmers had a positive impact on their credit accessibility for the horticultural activities. Dey et al. (2023) demonstrated in the Indian setting that socio-demographic variables determine institutional access to agricultural credit and the satisfaction of farmers because more educated and richer farmers have financial records and can communicate more efficiently with the personnel in the bank premises. Similarly, Lemma and Sharma (2024) emphasised that socio-economic inclusion and motivation promote support of urban and peri-urban agriculture. These results are in line with the Resource-Based View (RBV), which states that personal and home resources increase the capacity of a farmer to

obtain and use institutional credit. Therefore, socio-economic capacity is the most enabling factor and a separator when it comes to the accessibility of credit. Thus, it is hypothesised that:

- **H1:** Socio-economic factors have a significant positive influence on credit accessibility among horticulturists.

### **Institutional Factors and Credit Accessibility**

The mode of accessing and using credit by farmers is highly determined by institutional set ups and the effectiveness of financial institutions. The borrowing behaviour is highly affected by the distance to financial institutions, convenience of loan procedures, collateral conditions, and interest rates (Tonui, 2017; Dey et al., 2023). He et al. (2021) employed SEM to conclude that both institutional accessibility and procedural transparency are significant in determining the willingness of farmers to access formal credit. Likewise, Wei and Zhang (2025) found access to credit and social capital to be important drivers of agricultural scalability, whereas institutional networks and trust were the supportive drivers of agricultural scalability. The bureaucratic nature as well as institutional responsiveness to formal borrowing is low in most of the developing regions (Ullah et al., 2024; Adesiyun and Kehinde, 2024). Participation is also restricted as farmers are usually challenged to submit their documentation, make loans repaid on time and under harsh conditions. Wulandari et al. (2017) have noted that institutional trust and good financial management are major determinants of horticultural development in Indonesia. All in all, strict institutional planning assists in reducing the transaction costs, creating credibility and bridging the divide between credit demand and reality disbursement in the horticulture business. Thus, the hypothesis includes:

- **H2:** Institutional factors have a significant positive influence on credit accessibility among horticulturists.

### **Financial Literacy and Awareness**

Financial literacy and awareness are crucial cognitive and behavioural facilitators to enable farmers to work well with formal credit from banks. Financially literate farmers have an advantage of being more financially

literate and are therefore in a better position to comprehend loan conditions, evaluate the consequences of repayment and select appropriate credit facilities. In their study, Abid et al. (2020) concluded that financial agility and financial awareness mediated the connecting relationship between institutional support and credit accessibility, which they determined using SEM. Equally, Purohit et al. (2022) demonstrated that financial literacy increases the financial health of a rural household by improving households' credit and savings management capabilities. Dey and Singh (2023) conducted a study in the Indian agricultural environment where they found that institutional scheme awareness and procedural knowledge have a significant positive impact on the willingness of farmers to seek formal credit. This is in line with the Theory of Planned Behaviour, which implies that informed attitudes and perceived control influence financial choices.

On the other hand, low literacy and lack of credit education tend to self-isolate and rely on expensive informal lending (Dey and Singh, 2023; Wang et al., 2021). Formal credit participation in the horticulture sector can thus be increased by strengthening financial awareness through training, digital inclusion, and policy outreach. Consequently, the hypothesis is:

- **H3:** Financial literacy and awareness have a significant positive influence on credit accessibility among horticulturists.

### **Collateral and Risk Perception**

The continued perceived risk and collateral requirements remain serious impediments to the availability of institutional credit to farmers. Many financial institutions require collateral such as land or other tangible assets, which small horticulturists often lack. As a result, they find it difficult or discouraging to obtain loans or credit. In a study by Şengül (2025), risk perception was revealed to be a significant factor in the management of farmers and their decisions to adopt. The same researcher also noticed that in mountainous areas, access to both formal and informal credit is impeded by perceived repayment risk and collateral restrictions (Ullah et al., 2024). Dey et al. (2023) also observed that institutional factors have a mediating association with credit satisfaction through risk perception, which implies that the psychological comfort of farmers

involved in borrowing decisions is a determining factor in borrowing decisions. Wang et al. (2021) attested it also that not only in disadvantageous circumstances, but with favourable conditions, risk-averse farmers tend to avoid formal loans. Risk attitudes are conclusive in the borrowing behaviour in horticulture, where price fluctuations and perishability increase the uncertainty level. Hence, policies that reduce credit risk through flexible collateral requirements, crop insurance, and subsidised interest rates can significantly improve credit accessibility and repayment among horticultural farmers. Therefore, it is theorised that:

- **H4:** Collateral and risk perception have a significant negative influence on credit accessibility among horticulturists.

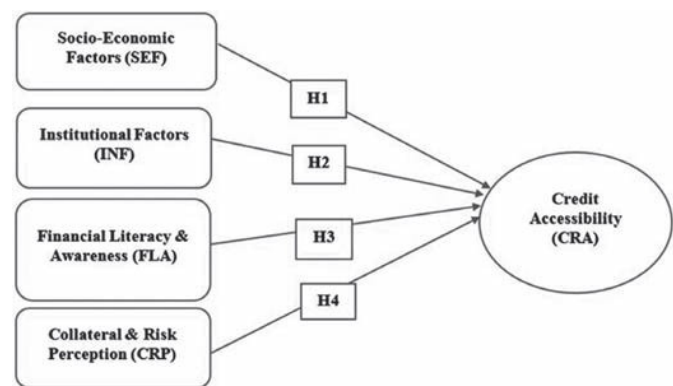
### Research Gap

While prior studies have extensively examined agricultural credit, the credit accessibility of horticulturists remains underexplored, especially through an integrated structural equation modelling (SEM) framework. Most existing works focus either on general agriculture or microcredit programs (Adams, 2015; Tonui, 2017; Kundu & Das, 2021), often using regression or descriptive methods that overlook the simultaneous relationships among socio-economic, institutional, informational, and behavioural determinants. Studies like Abid et al. (2020), Wang et al. (2021), and Dey et al. (2023) have shown the potential of SEM in explaining complex interdependencies. Yet few have applied it specifically to horticultural finance, particularly in the Indian Himalayan context, where horticulture forms a major livelihood base (Mehta, 2023). Moreover, limited attention has been paid to how financial literacy and risk perception jointly shape formal credit behaviour among horticulturists. Thus, this study fills a crucial empirical and methodological gap by developing and validating a structural model that explains the determinants of credit accessibility among horticulturists using primary data.

### Conceptual Framework

Based on the literature, this study conceptualises credit accessibility among horticulturists as a function of four interrelated determinants: socio-economic factors, institutional factors, financial literacy and awareness, and collateral and risk perception. The first three

constructs are expected to have positive influences, while collateral and risk perception are hypothesised to have a negative influence on credit accessibility. This structure aligns with previous SEM-based studies that integrate both resource-based and behavioural perspectives to explain farmers' credit decisions (Abid et al., 2020; Wang et al., 2021; Dey et al., 2023). The conceptual model in Figure 1, therefore, provides a holistic framework to assess how these latent constructs collectively determine horticulturists' access to formal credit.



**Figure 1:** Conceptual Framework

*Source:* Authors' compilation

### METHODOLOGY

This study was conducted in Himachal Pradesh, focusing on the districts of Shimla, Kullu, and Kinnaur, which together represent the core horticultural belt of the state. The fact that the main source of rural livelihoods has been horticulture, particularly the production of apples and stone fruits, was chosen purposely as it earns residents in the rural areas a significant portion of household income. Even with this economic dependence, farmers in this region continue to experience water-tight limitations to formal access to credit due to collateral and long procedures and a lack of financial literacy (Mehta, 2023; Dey et al., 2023). The study targeted horticulturists as the respondent group since they are the principal stakeholders in the region's agricultural economy and directly experience the challenges of credit accessibility. The purposive sampling method was combined with the use of a multistage random sampling procedure since the three districts were randomly chosen first, two blocks of each district were randomly selected, and 20 farmers were randomly selected among the village lists provided by horticulture departments and cooperatives. The final

sample size of 500 horticulturists was statistically justified, as Hair et al. (2019) recommend at least 400 observations for stable parameter estimation in SEM models. Similar agricultural finance studies using Structural Equation Modelling have used comparable sample sizes ranging between 300 and 600, confirming adequacy for model testing and generalisability (Abid et al., 2020; Wang et al., 2021).

Primary data were collected between February and April 2025 through face-to-face surveys using a structured questionnaire developed from established scales in agricultural and financial behaviour literature. The instrument included five sections corresponding to the study's constructs: socio-economic factors, institutional factors, financial literacy and awareness, collateral and risk perception, and credit accessibility. The measurements were performed on a five-point Likert scale that ranged between 1 (strongly disagree) to 5 (strongly agree). Items were adapted based on previous studies that have been validated to achieve conceptual consistency and content validity (Abid et al., 2020; Tonui, 2017; Hasbiy and Hardana, 2024). The dependent variable, Credit Accessibility, was modified based on Akudugu (2012) and Ololade and Olagunju (2013) where the ease at which they could access credit, the suitability of loan amounts and the speed at which credit was received were measured. Institutional Factors construct was developed based on the works of Dey et al. (2023), Khatun (2019), and others and aimed at analysing how financial institutions, cooperatives, and the support of policies contribute to the achievement of access to credit.

The construct Awareness and Financial Literacy was translated into Lusardi and Mitchell (2014) and Potrich et al. (2015), who used the scale to measure the level of knowledge of financial products, awareness of the terms of the loan, and the awareness of the presence of credit schemes. The construct Collateral Requirements was modified based on Khatun (2019) and Sehgal (2024) that evaluated the impact of collateral requirements, documentation process, and lending formalities on the ability of farmers to access loans. Construct Socio-Economic Factors was modified based on Demirguc-Kunt et al. (2018), which evaluates the impact of the household income, landholding size,

level of education, and household composition on access to credit. Each of the items was contextualised to the horticulture industry in Himachal Pradesh to make sense, dependable and relevant to the context of the study. Furthermore, items were evaluated by academic professionals and local horticulture officers, and a pilot study of 50 farmers ensured the coherence and trustworthiness of questions (Cronbach's alpha above 0.7) (Hair et al., 2019). Descriptive statistics and Structural Equation Modelling (SEM) using SPSS 26.0 and AMOS 23.0 were used to analyse data. The validity of the measurement model was confirmed through Confirmatory Factor Analysis (CFA) with convergent (factor loading went above 0.6, AVE went above 0.5, CR went above 0.7), and discriminant (Fornell-Larcker criterion and HTMT ratio) validity. Afterwards, model fit indices, Chi-square /df (Less than 3), CFI, TLI (More than 0.90), RMSEA and SRMR (Less than 0.08) were evaluated to assess the structural model following Hu and Bentler (1999).

SEM was also appropriate in the study since, at the same time, it approximates several relationships between latent variables, addresses measurement errors, and can be used to test hypotheses about behaviours in complex behavioural models (Abid et al., 2020; Wang et al., 2021). This renders it suitable for the analysis of the multidimensional determinants to access credit among horticulturists. Procedural remedies, including respondent anonymity, randomised order of asking questions and neutral wording, were employed to decrease the common method bias (CMB). The single-factor test used by Harman statistically did not explain more than thirty percent of variance, and there was also a Common Latent Factor (CLF) analysis used to confirm that there was minimal bias (Podsakoff et al., 2012). Before the fieldwork, ethical approval was obtained, and informed consent was obtained from all the participants. Comprehensively, the research design of representative sampling of the population of Shimla, Kullu, and Kinnaur, a validated questionnaire, as well as SEM-based data analysis, guarantees the methodology rigour, reliability, and contextual comprehensiveness in considering the influences of credit availability among the horticulturists of Himachal Pradesh.

## RESULT AND FINDINGS

### Statistical Description of Respondents

**Table 1:** Respondent Demographics (n = 500)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	372	74.4
	Female	128	25.6
Age Group (Years)	Below 30	60	12.0
	31–45	205	41.0
	46–60	158	31.6
	Above 60	77	15.4
Education Level	Primary	52	10.4
	Secondary	126	25.2
	Higher secondary	176	35.2
	Graduate and above	146	29.2
Annual Income (₹)	Below 2 lakh	88	17.6
	2–4 lakh	182	36.4
	4–6 lakh	134	26.8
	Above 6 lakh	96	19.2
Landholding Size (ha)	Below 0.5	90	18.0
	0.5–1.0	208	41.6
	1.1–2.0	145	29.0
	Above 2.0	57	11.4
Type of Horticultural Crop	Apple	254	50.8
	Stone fruits (peach, plum, apricot)	118	23.6
	Off-season vegetables	86	17.2
	Others (floriculture, nuts, etc.)	42	8.4
District	Shimla	260	52.0
	Kullu	140	28.0
	Kinnaur	100	20.0

Source: Authors' compilation

According to Table 1, most of the horticulturists sampled were men (74.4%) and in the working-age of 31 to 45 years (41%) and therefore the decisions concerning credit are dominated by economically active middle-aged men. The majority of the respondents were either secondary to higher to secondary (60.4%), which is moderate literacy, facilitating financial awareness and decision-making (Hasbiy and Hardana, 2024; Dey and Singh, 2023). The percentage of 0.5-1 hectare of land was also quite high (41.6%), which is characteristic of the smallholder horticulture in Himachal Pradesh (Mehta, 2023). The income distribution indicated that 54% had a gross income of between 2-4 lakh/annually, implying a moderate level of financial security to

engage in formal credit lending (Dey et al., 2023). The most common (50.8%), particularly in Shimla (52%), was the cultivation of apples due to its position as the main source of horticultural crops and economy in the region (Wulandari et al., 2017).

### Reliability and Validity Results

**Table 2:** Analysis of Reliability

Construct	Items (No.)	Cronbach's Alpha ( $\alpha$ )	Interpretation
Socio-Economic Factors (SEF)	5	0.812	Reliable
Institutional Factors (INF)	6	0.864	Highly Reliable
Financial Literacy & Awareness (FLA)	5	0.839	Reliable
Collateral & Risk Perception (CRP)	4	0.786	Acceptably Reliable
Credit Accessibility (CRA)	5	0.871	Highly Reliable
Overall Reliability (Composite)	25	0.834	Reliable

Source: Authors' compilation

Table 2 indicates that all constructs in the model demonstrate strong internal consistency, with Cronbach's alpha values ranging from 0.786 to 0.871, all exceeding the acceptable threshold of 0.70 (Hair et al., 2019). Institutional Factors ( $\alpha = 0.864$ ) and Credit Accessibility ( $\alpha = 0.871$ ) show the highest reliability, reflecting consistent measurement across items, while Collateral & Risk Perception ( $\alpha = 0.786$ ) remains within acceptable limits. The overall composite reliability ( $\alpha = 0.834$ ) confirms that the instrument used for assessing determinants of credit accessibility among horticulturists is statistically robust and dependable (Abid et al., 2020; Dey et al., 2023).

### Measurement Model Assessment Analysis

Table 3 reports the findings that all constructs possess satisfactory measurement properties with standardised loadings of above .70 and moderate and strong explanatory, powerful  $R^2$ . The Composite Reliability (CR), which ranges from 0.836 to 0.912, indicates strong internal consistency across all constructs. Similarly, the Average Variance Extracted (AVE), ranging from 0.563 to 0.664, exceeds the recommended threshold of 0.50, confirming that convergent validity is

**Table 3:** Summary of the Model

<i>Variables</i>	<i>Label</i>	<i>Standardised Loading</i>	<i>R<sup>2</sup></i>	<i>CR</i>	<i>AVE</i>	<i>MSV</i>	<i>ASV</i>
Socio-Economic Factors (SEF)	SEF1	0.821	0.675	0.836	0.608	0.310	0.246
	SEF2	0.784	0.614				
	SEF3	0.742	0.551				
	SEF4	0.713	0.508				
	SEF5	0.832	0.692				
Institutional Factors (INF)	INF1	0.846	0.701	0.912	0.634	0.328	0.271
	INF2	0.817	0.664				
	INF3	0.783	0.612				
	INF4	0.752	0.566				
	INF5	0.802	0.644				
	INF6	0.773	0.598				
Financial Literacy & Awareness (FLA)	FLA1	0.801	0.642	0.836	0.608	0.295	0.253
	FLA2	0.774	0.599				
	FLA3	0.826	0.682				
	FLA4	0.709	0.503				
	FLA5	0.783	0.614				
Collateral & Risk Perception (CRP)	CRP1	0.771	0.595	0.837	0.563	0.271	0.224
	CRP2	0.734	0.539				
	CRP3	0.802	0.643				
	CRP4	0.689	0.475				
Credit Accessibility (CRA)	CRA1	0.847	0.717	0.875	0.664	0.323	0.261
	CRA2	0.812	0.659				
	CRA3	0.744	0.554				
	CRA4	0.786	0.618				
	CRA5	0.878	0.771				

Source: Authors' compilation

achieved (Hair et al., 2019). The AVE of each construct is also larger than the Maximum shared variability and the Average shared variability (MSV and ASV) of each construct, which confirms the discriminant validity (Fornell and Larcker, 1981). All these findings suggest that the measurement model is statistically valid, with the constructs reflecting its conceptual dimensions in the context of the accessibility to credit among horticulturists (Abid et al., 2020; Wang et al., 2021).

**Discriminant Validity Analysis**

As shown in Table 4, the square root of the AVE values (bold diagonal values) is higher than the inter-construct correlations, thus supporting the discriminant validity according to the Fornell-Larcker criterion (Fornell and Larcker, 1981). Institutional Factors and Credit Accessibility (0.612) demonstrate the strongest but separate relationship as the highest inter-construct

**Table 4:** Discriminant Validity (Fornell–Larcker Criterion)

<i>Constructs</i>	<i>SEF</i>	<i>INF</i>	<i>FLA</i>	<i>CRP</i>	<i>CRA</i>
Socio-Economic Factors (SEF)	<b>0.780</b>				
Institutional Factors (INF)	0.557	<b>0.796</b>			
Financial Literacy & Awareness (FLA)	0.498	0.529	<b>0.780</b>		
Collateral & Risk Perception (CRP)	-0.411	-0.438	-0.367	<b>0.750</b>	
Credit Accessibility (CRA)	0.584	0.612	0.596	-0.459	<b>0.815</b>

Source: Authors' compilation

correlation, whereas Collateral and Risk perception exhibit negative correlations with other constructs, which proves the inverse role of this construct as hypothesised (Dey et al., 2023; Wang et al., 2021).

Altogether, these findings support the conclusion that each construct is used to measure the different conceptual dimensions that do not overlap significantly, which contributes to the strength of the measurement model (Abid et al., 2020).

**Model Fit Indices and Structural SEM Model**

**Table 5:** Model Fit Measure (SEM)

Fit Index	Recommended Threshold	Observed Value
$\chi^2 / df$	< 3.00	1.984
GFI	> 0.90	0.932
AGFI	> 0.90	0.911
CFI	> 0.90	0.957
TLI	> 0.90	0.949
IFI	> 0.90	0.958
NFI	> 0.90	0.928
RMSEA	< 0.08	0.042
SRMR	< 0.08	0.047
PCLOSE	> 0.05	0.173

Source: Authors' compilation

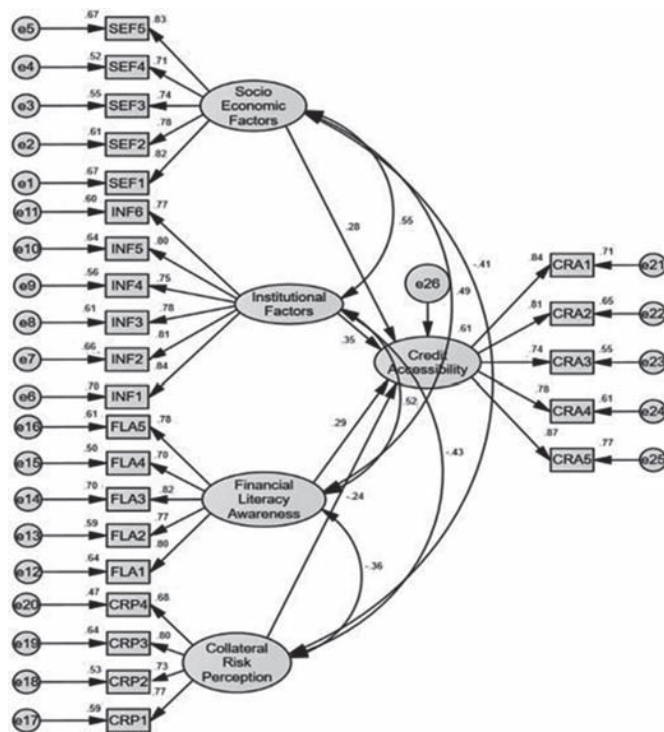
Table 5 shows that all model fit indices fall well within the recommended thresholds, confirming an excellent fit of the structural model to the observed data. The  $\chi^2/df$  ratio (1.984) is below 3, indicating an acceptable level of parsimony, while incremental fit indices such

as CFI (0.957), TLI (0.949), IFI (0.958), and NFI (0.928) all exceed 0.90, demonstrating strong model adequacy (Hu & Bentler, 1999). The absolute fit measures GFI (0.932) and AGFI (0.911) further support model suitability, and the low error values for RMSEA (0.042) and SRMR (0.047) confirm minimal residual variance (Hair et al., 2019; Hu & Bentler, 1999; Byrne, 2016). A PCLOSE value of 0.173 (> 0.05) validates the model's overall stability and goodness of fit. These results collectively confirm that the proposed SEM model provides a well-fitting and statistically robust representation of horticulturists' credit accessibility determinants (Abid et al., 2020; Wang et al., 2021).

The SEM model in Figure 2 depicts the relationships between four exogenous variables—Socio-Economic Factors (SEF), Institutional Factors (INF), Financial Literacy & Awareness (FLA), and Collateral & Risk Perception (CRP)—and the endogenous variable, Credit Accessibility (CRA). All indicator loadings exceed 0.68, confirming strong reliability and convergence. Institutional Factors ( $\beta = 0.35$ ), Financial Literacy ( $\beta = 0.29$ ), and Socio-Economic Factors ( $\beta = 0.28$ ) positively influence Credit Accessibility, while Collateral & Risk Perception ( $\beta = -0.24$ ) shows a significant negative effect. The model explains 61% of the variance in CRA ( $R^2 = 0.61$ ), indicating strong explanatory power. Overall, institutional support, financial awareness, and socio-economic strength enhance credit access, while higher risk perception and collateral barriers hinder it.

**Testing of Proposed Hypotheses**

The outcome of hypotheses testing and path analysis is provided in Table 6, which proves the fact that all the hypothesised relationships are statistically significant at  $p < .001$ . The strongest positive effect goes to the Institutional Factors ( $\beta = 0.35$ ), then the Financial Literacy and Awareness ( $\beta = 0.29$ ), and the Socio-Economic Factors ( $\beta = 0.28$ ), and the critical role of the institutional efficiency and financial awareness in enhancing access to credit. On the contrary, Collateral/Risk Perception reveals a strong negative impact ( $\beta = -0.24$ ), which suggests that the perceived risk, as well as the perceived collateral requirements, are the obstacles to the formal adoption of credit by horticulturists. All four hypotheses (H1 to H4) are confirmed, and the findings coincide with the previous studies, which also



**Figure 2:** Structural Model (SEM)  
Source: AMOS Output

**Table 6:** Tests of Hypotheses and Path Coefficients

Hypothesis	Path	Standardised $\beta$	t-value	p-value	Result
H1	Socio-Economic Factors → Credit Accessibility	0.28	4.972	p < .001	Supported
H2	Institutional Factors → Credit Accessibility	0.35	6.128	p < .001	Supported
H3	Financial Literacy & Awareness → Credit Accessibility	0.29	5.416	p < .001	Supported
H4	Collateral & Risk Perception → Credit Accessibility	-0.24	-4.205	p < .001	Supported

Source: Authors' compilation

identify institutional and informational determinants in the process of affecting the financial inclusion of farmers (Dey et al., 2023; Abid et al., 2020; Wang et al., 2021).

## DISCUSSION

### Analysis of Findings

The study results contain valuable data on the predictors of credit accessibility in horticulturists in Himachal Pradesh, focusing on the districts of Shimla, Kullu, and Kinnaur. The results have demonstrated that the four hypothesised determinants are of enormous significance in availing credit and this is manifested in the success of the postulated SEM framework. Specifically, the most important predictor ( $\beta = 0.35, p < .001$ ) has been found to be institutional reasons, which means that the closeness to financial services, the simplicity of transactions with loans, and the availability of efficient credit institutions might have been the most impactful factors in the facilitation of access to formal credit by the farmers. This is in line with the previous research that stated that institutional responsiveness and transparency in procedures are significant to enhancing access to credit in rural settings (Tonui, 2017; Dey et al., 2023). There was also a strong positive correlation between financial literacy and financial awareness ( $\beta = 0.29, p < .001$ ), indicating that financially skilled farmers tend to approach institutional lenders and use credit more adequately, which is also in line with the findings of Abid et al. (2020) and Purohit et al. (2022). The socio-economic factor outcome ( $\beta = 0.28, p < .001$ ) suggests that education, income, and experience in farming operations make a significant contribution to enhancing confidence in farmers and their chances of being eligible to take formal credit, which agrees with the Resource-Based View that personal capabilities reinforce financial sources (Hasbiy and Hardana, 2024; Adams, 2015). On the other hand, the collateral and risk perception had an important negative effect ( $\beta$

= -0.24,  $p < .001$ ), which implied that the institutional credit was avoided by farmers, particularly when collateral requirements were high and their fear of default in repayment.

The model fit statistics ( $\chi^2/df = 1.984, CFI = 0.957, RMSEA = 0.042$ ) show that the model depicts an excellent fit overall (Table 5). The results of reliability and validity (Tables 2–4) are also an additional indication of internal consistency and discriminant distinctiveness of the constructs, confirming that each factor has its own share in explaining access to credit. The demographic data (Table 1) support the contextual importance of those findings as well. The vast majority of the respondents were smallholder apple farmers with moderate education and limited land areas, which is the group most restricted by the institutional and collateral requirements (Mehta, 2023; Dey and Singh, 2023). The socio-economic analysis conducted under Objective 1 showed that financial empowerment and education were central to enhancing credit uptake, whereas Objective 2 -which involves the consideration of structural and procedural changes- reveals that significant gaps can be broadened considerably. Objective 3 was satisfied by ensuring that financial literacy is a key driver in shaping credit adoption behaviour, and Objective 4 was achieved by empirically confirming that risk aversion and collateral constraints are significant discouraging factors to systematic borrowing.

In practice, these findings imply that a possible way to increase credit accessibility among horticulturists is to increase institutional efficiency, provide collateral-free or group-based lending, and reinforce the financial education programme. These findings are in line with the former data, showing that a blend of policy strategies towards institutional and behavioural barriers is essential to rural sustainable financing (Wang et al., 2021; Dey et al., 2023). The study establishes that credit accessibility and perceived risk deterrents are generated in a socio-economic strength, institutional

trust, and financial awareness (when combined), which offer both theoretical and practical insights as to how credit accessibility in horticultural finance systems within hill areas can be harnessed.

## CONCLUSION

The present study concludes that the availability of credit in the hands of horticulturists in Himachal Pradesh is a joint decision of socio-economic, institutional, informational, and behavioural factors. The outcomes of the SEM indicate that the institutional factors are the most positive and then the financial literacy, awareness, and socio-economic characteristics, whereas the collateral and risk perception have a negative impact. Such results indicate that institutional efficiency and financial awareness are vital along with individual resources to be able to engage in formal credit participation (Dey et al., 2023; Wang et al., 2021). All the four objectives of the research are empirically confirmed in the study, which proves that structural and behavioural aspects should be tackled to attain inclusive credit systems. The significant level of reliability and model fit reveals the power of the suggested SEM framework (Abid et al., 2020). Theoretically, the results support the Resource-Based View and the institutional theory, as they show that the availability of financial resources depends on the personal capacity and the development of the institution (Hasbiy & Hardana, 2024; Adams, 2015). In theory, the institutional responsiveness is one of the most efficient strategies which are facilitated by the simplification of the loan processes, the financial literacy, and the decreased collateral requirements (Şengül, 2025; Ullah et al., 2024; Mehta, 2023). Overall, rural resiliency and agricultural sustainability in the hilly regions in India can be facilitated by enhancing horticultural credit access (Dey et al., 2023; Wang et al., 2021).

### Implications of the Study

The research results offer strong theoretical and practical implications for advancing financial inclusion and improving credit delivery to horticulturists in India. Theoretically, the findings validate the Resource-Based View (RBV) and institutional theory, which suggest that farmers' internal capacities—such as education, income, and experience—and external institutional support jointly determine access to

credit (Hasbiy & Hardana, 2024; Dey et al., 2023). The significant influence of institutional and socio-economic factors reinforces the argument that financial access depends not only on credit supply but also on individual readiness and systemic responsiveness, supporting Wang et al.'s (2021) view that structural and behavioural determinants operate synergistically. Moreover, identifying financial literacy and risk perception as key predictors extends conventional rural finance theory by integrating behavioural and informational dimensions (Abid et al., 2020; Purohit et al., 2022).

In practice, the results inform banks, policy makers and rural development agencies. Banks can streamline lending operations, lessen collateral requirements and develop products that conform to the cash flow of small agricultural farmers. Gaps in access can also be addressed by increasing the number of digital finance devices and bank offices in regions with high levels of horticulture, such as Shimla, Kullu, and Kinnaur (Mehta, 2023). Farmers will also be empowered to read the terms of loans, keep records and make repayments in case they invest in financial literacy programmes. The policy-makers are to tackle the issue of risks by implementing the flexibility of collateral norms, group-based lending, and interest subsidies (Şengül, 2025; Ullah et al., 2024). The institutional responsiveness and risk mitigation mechanisms can be improved to ensure that the farmers trust in formal credit services and avoid relying on informal lenders. Ultimately, these implications represent a dual opportunity—to improve credit accessibility and foster sustainable horticulture in India's hilly regions. By aligning credit policies, financial literacy, and institutional frameworks, inclusive financing can promote economic resilience, social equity, and long-term self-sufficiency in the rural horticultural economy (Dey et al., 2023; Wang et al., 2021).

### LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

Despite its exhaustive nature, this study is limited in a number of ways. It relies on cross-sectional primary data that is not a clear reflection of seasonal or long-term trends in the credit behaviour of farmers (Abid et al., 2020). The three districts targeted, that is, Shimla, Kullu, and Kinnaur, do not allow generalising

the results to other areas with varying institutional or economic backgrounds (Mehta, 2023). It looked at only those determinants that were selected and thus failed to factor in other possible factors like market access or social capital (Dey et al., 2023). Furthermore, since the data are self-reported, it is not possible to eliminate the minor bias of the responses despite the measures of bias control. Finally, although SEM offers good analytical data, it does not allow the determination of causality, which implies the possibility of new longitudinal or cross-sectional research in the future (Wang et al., 2021).

Future studies of the credit accessibility of horticulturists would be enhanced by integrating longitudinal and mixed methods to reflect a shift in the borrowing behaviour and institutional reaction in the course of time (Abid et al., 2020). A more qualitative method, such as in-depth interviews or focus groups with farmers, bankers, and policymakers, would give more detailed data about the obstacles and incentives driving credit decision-making (Dey et al., 2023). The inclusion of other horticultural regions or states would contribute to the external validity of the study and would permit the comparison between regions (Mehta, 2023). In addition, the digital financial inclusion, policy awareness, and social capital ideas could also be included in the future study that could probably explain additional differences in the access to credit (Wang et al., 2021). Finally, a time-series or panel data design would be capable of showing the impact of the institutional reforms and financial literacy programmes on the credit behaviour and long-term sustainability.

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