Financial Literacy and Financial Well-Being of Farmers in the Hyderabad Karnataka Region of Karnataka

Channaveerayya Hiremath[1] and Bondita Saikia[2]

ABSTRACT

Agriculture in India is characterized by income volatility, indebtedness, and reliance on informal credit, making financial literacy an important determinant of household resilience. Farmers in the Hyderabad Karnataka (Kalyana Karnataka) region, one of the state's most socio-economically backward areas, face persistent challenges of low literacy, fragmented landholdings, and limited access to formal finance. This study investigates the relationship between financial literacy and financial well-being among farmers in Kalaburagi district. Specifically, it examines how the three dimensions of literacy, financial knowledge, behaviour, and attitude, contribute individually and collectively to shaping financial outcomes. Using a multistage random and purposive sampling, data were collected from 432 farming households through a structured questionnaire adapted from OECD/INFE and CFPB frameworks. Analytical techniques included multiple regression, ANOVA, and Structural Equation Modelling (SEM). Results reveal that financial literacy explains over 60 percent of the variance in financial well-being, with behaviour and attitude emerging as powerful predictors. SEM confirms financial literacy as a robust latent construct, significantly influencing household resilience and resource management. The study concludes that financial literacy functions as both a protective and enabling capability in rural agrarian settings. Policy implications highlight the need for gender-sensitive, participatory literacy programs integrated with accessible financial products to strengthen rural financial systems and advance inclusive growth.

Keywords: Agricultural finance, financial inclusion, financial knowledge

JEL codes: G53, Q14, I32, D14, C38

I

INTRODUCTION

Agriculture in India is not merely an economic activity but a way of life for nearly half of the country's workforce. It continues to sustain rural livelihoods, contribute to food security, and support India's socio-economic fabric. For millions of farming households, agriculture remains an uncertain and fragile pursuit. Market volatility, climatic shocks, and structural constraints repeatedly undermine farm profitability. Alongside these challenges, financial vulnerability has become a defining feature of rural India, reflected in chronic indebtedness, reliance on informal lenders, and, tragically, farmer suicides. In such a context, financial literacy emerges as a foundational capability. It is the knowledge, behaviour, and attitude that enable individuals to engage effectively with financial resources, to plan, to save, to borrow judiciously, and to protect themselves against shocks. For farmers, whose incomes are seasonal and volatile, financial literacy is not a peripheral skill but an essential determinant of financial well-being. The Indian experience accentuates the gravity of financial fragility. Between 2018 and 2022, nearly 30,000 suicides in India were attributed to bankruptcy and indebtedness, with the overwhelming majority concentrated among small and marginal farmers in low-income brackets (National

[1]Garden City University, Karnataka
[2]Institute for Social and Economic Change, Bengaluru

Crime Records Bureau, 2023). These statistics are not merely numbers: they are symptoms of systemic deficiencies in the financial empowerment of rural households. They reveal how low financial capability compounds vulnerability by constraining access to affordable credit, limiting awareness of insurance or risk-management products, and perpetuating cycles of distress. Access to finance without the ability to use it effectively often fails to translate into well-being (Basu, 2019). Financial literacy is thus not simply an educational aspiration but an economic necessity.

The problem is compounded by the peculiarities of agriculture. Farming is a business of risk: the outcomes of one season depend on weather, pests, price movements, and input costs, many of which are beyond the farmer's control. To farm profitably, one requires not only agronomic skills but also the ability to plan finances, managing seasonal inflows and outflows, using credit prudently, diversifying risks, and maintaining savings for lean periods. Farmers with even basic financial literacy can evaluate loan terms, avoid exploitative moneylenders, understand repayment schedules, and plan investments in technology or diversification. Conversely, financial illiteracy traps farmers in cycles of over-borrowing, high-interest debt, and suboptimal resource allocation. India's policy response has rightly emphasized financial inclusion. Initiatives such as the Pradhan Mantri Jan Dhan Yojana, the expansion of rural bank branches, the Kisan Credit Card scheme, and direct benefit transfers (PM Kisan) have expanded formal financial access (Reserve Bank of India, 2022). NABARD's All India Financial Inclusion Survey (2016–17) revealed that while many rural households hold bank accounts, actual usage remains low, and reliance on informal credit persists. Scholars argue that the missing link is financial literacy, without knowledge, behaviour, and attitudes conducive to financial planning, access alone cannot secure well-being (Chakrabarty, 2021).

Financial literacy among farmers in India reveals a worrying picture. Maji and Laha (2023) found that the average financial literacy score among Indian farmers was barely one-third of the maximum, with large regional disparities. Education, landholding size, income level, and age were significant determinants. A similar pattern emerges in state-level studies: in Punjab, Vikas and Naik (2025) reported that half of their sample of farmers demonstrated low literacy, with attitudinal deficits particularly severe. These findings accentuate that literacy is not uniform; it varies with socio-economic and demographic attributes, which also shape financial well-being. However, despite the growing literature, few studies systematically connect the three dimensions of literacy, knowledge, behaviour, and attitude to comprehensive measures of well-being, especially in backward regions such as Hyderabad Karnataka. The Hyderabad Karnataka (or Kalyana Karnataka) region provides a distinctive context for such an inquiry. Despite integration into Karnataka, this region continues to lag behind the rest of the state in literacy, infrastructure, irrigation coverage, and financial penetration. Farmers in districts such as Kalaburagi, Bidar, Yadgir, Koppal, and Raichur typically operate small and fragmented holdings,

rely heavily on rain-fed agriculture, and are exposed to volatile market conditions. Their incomes are seasonal, often supplemented by casual wage labour or non-farm income. Institutional credit has expanded but remains patchy, and dependence on informal lenders persists. Anecdotal evidence points to misallocation of loans, under-insurance, and chronic debt burdens. In such a landscape, financial literacy could play a transformative role, but empirical evidence remains scarce.

Financial literacy matters for at least three reasons. First, at the micro level, it directly influences household well-being by shaping saving, borrowing, consumption smoothing, and investment behaviour. Second, at the meso level, it determines the effectiveness of rural credit systems: literate farmers are more likely to use credit productively, repay on time, and adopt new financial products. Third, at the macro level, it has implications for productivity, technology adoption, and rural development: well-managed farm finances enable greater uptake of improved seeds, irrigation, and mechanisation, thereby raising agricultural output and stabilising rural economies. These channels stress that financial literacy is not merely a matter of behavioural finance but is central to the concerns of agricultural economics and policy. Theoretical insights also illuminate this connection. Classical growth models (Solow, 1956; Swan, 1956) emphasised the role of savings and investment in driving growth, while later refinements stressed the contribution of human capital. Financial literacy can be conceived as a form of human capital. It enhances the ability to mobilise savings, to invest prudently, and to manage risk. Endogenous growth theory (Romer, 1990) highlights the spillover effects of knowledge, suggesting that once farmers acquire financial capability, the benefits diffuse within communities. A financially literate farmer who demonstrates the profitability of crop insurance or repayment discipline may influence neighbours, generating positive externalities. This provides further justification for policy interventions that prioritise literacy, not just access. Despite this, empirical research linking financial literacy and well-being in India remains limited and fragmented. Much of the literature either focuses on urban populations or treats financial inclusion as a binary matter of access rather than capability. Studies in agricultural contexts often restrict themselves to descriptive assessments of literacy levels, without probing how these translate into financial well-being in a holistic sense.

Against this backdrop, the present study attempts three specific objectives. First, it seeks to analyse the relationship between farmers' financial knowledge, behaviour, attitude, and their financial well-being. This reflects the recognition that literacy is multi-dimensional, and that each component may contribute differently to shaping well-being. Second, it aims to evaluate the specific impact of knowledge, behaviour, and attitude on financial well-being, to disentangle their relative importance and policy relevance. Third, it endeavours to measure the overall effect of financial literacy on financial well-being among farmers in the Hyderabad Karnataka

region, thereby generating empirical evidence to inform both scholarly debates and policy interventions in agricultural finance.

II

MATERIALS AND METHODS

The study area is the Kalyana-Karnataka (HK) region, which remains the most socio-economically backward part of Karnataka. Within this region, Kalaburagi District was selected as the focal area. A multistage sampling framework, combining random and purposive techniques, was employed to ensure representativeness across constituencies while also capturing household-level heterogeneity. At the first stage, the sampling frame was stratified into the nine Assembly constituencies of Kalaburagi. In the second stage, two Gram Panchayats/Wards were randomly selected from each constituency, yielding 18 units. In the third stage, two villages or colonies were randomly chosen from each Gram Panchayat/Ward, resulting in 36 units in total. Finally, at the household level, 12 farming households were purposively selected from each village/colony. This resulted in a final sample size of 432 households (36 × 12), each considered as a single decision-making unit. The purposive selection of households was guided by the recognition that farming communities are highly diverse in terms of socio-economic conditions, and these differences directly shape financial literacy and financial well-being. In particular, the study sought to include households across variations in: Landholding size (marginal, small, semi-medium, medium, and large), Cropping pattern (food crops vs. cash crops, irrigated vs. rainfed systems), Annual income levels (low, medium, relatively high), Educational attainment of household heads (illiterate to higher educated), Age group of household heads (youth, middle-aged, elderly farmers), etc.

These factors are not merely background descriptors; they are central to understanding differences in household financial behaviour. For example, larger holdings and diversified cropping systems may buffer income shocks, while smallholders remain highly vulnerable to market fluctuations. Likewise, education and age influence the ability to acquire, process, and apply financial knowledge. Including such variation through purposive sampling strengthened the study's analytical depth. The reality of farm incomes in the HK region adds another layer of complexity. Agricultural income is seasonal and volatile, depending on harvest outcomes and prevailing market prices. For many households, this is further supplemented by wage labour, livestock rearing, or non-farm activities. These supplementary incomes strongly affect financial decision-making, shaping patterns of saving, borrowing, and investment. A purely random household selection could have overlooked these nuances, whereas purposive inclusion ensured that the sample reflected this diversity.

Data collection was undertaken using a structured questionnaire. Financial literacy was assessed through the OECD/INFE and NCFE standardized

frameworks, which capture three dimensions Financial Knowledge, Financial Behaviour, and Financial Attitude. Financial well-being was measured using the OECD's methodology. The Consumer Financial Protection Bureau (CFPB) questionnaire is utilized to evaluate financial well-being. However, these questionnaires must be modified to align with the study's cultural context, currency, financial instruments, and objectives. The questionnaire is structured into six sections. The first part focuses on gathering demographic information about the respondents, including gender, education, occupation, age, and income. The second part assesses awareness, ownership, and utilization of financial products and services. The third, fourth, and fifth sections evaluate the level of financial literacy, comprising its components A) Financial Knowledge, B) Financial Behavior, and C) Financial Attitude. The sixth section addresses the financial well-being of the respondents. Financial literacy was measured using 23 questions covering the three attributes: Financial Knowledge, Financial Behaviour, and Financial Attitude. Each correct or positive response was awarded one mark, while incorrect or negative responses were scored zero. Thus, the minimum possible score was 0 and the maximum possible score was 23, representing the overall financial literacy score for each respondent.

TABLE 1. SCALE DESCRIPTION

Parts	Variables	No. of Items	Sources
Part I	Demographic Details	7 Questions	Self-Designed
Part II	Financial Literacy		
	Financial Knowledge	8 Statements	Lusardi and Mitchell (2014); OECD (2013): NCFE. (2019).
	Financial Behavior	10 Statements	NCFE. (2019) Atkinson and Messy (2012); OECD (2013)
	Financial Attitude	5 Statements	OECD (2013); Potrich et al. (2018).
Part III	Financial product Awareness, Ownership, and Utilisation.	24 Financial products and Services.	NCFE. (2019)
Part IV	Financial Wellbeing		CPFB (2015).

The purposive component of sampling introduces potential selection bias, which may constrain the generalizability of results beyond the district. However, this was a deliberate trade-off: purposive sampling allowed for the inclusion of diverse household types important for explaining intra-regional disparities. Hence, while caution is needed in extending the findings to all rural households in Karnataka, the study offers valuable insights into the intersection of socio-economic heterogeneity, financial literacy, and financial well-being in one of India's most disadvantaged agrarian regions.

The tools for the analysis are multiple regression analysis, ANOVA, and Structural Equation Modelling (SEM).

<div align="center">III</div>

<div align="center">RESULTS</div>

3.1 Relationship between Components of Financial Literacy and Financial Well-Being

Financial literacy, reflected through knowledge, behaviour, and attitude, plays a vital role in shaping the financial well-being of farmers. Understanding how these components interact with well-being is crucial, as they determine how effectively households plan, save, and manage risks in a volatile agricultural context. This section analyses the extent to which these three attributes collectively influence farmers' financial well-being.

TABLE 2. OVERALL MODEL SUMMARY FOR THE INFLUENCE OF FINANCIAL LITERACY COMPONENTS ON FINANCIAL WELL-BEING

R	R Square	Adjusted R Square	Std. Error of the Estimate	Change of statistics				
				R Square Change	F Change	df1	df2	Sig. F Change
0.815[a]	0.663	0.661	5.75091	0.663	281.264	3	428	0.001

The regression results presented in Table 2 show a strong relationship between the three components of financial literacy, knowledge, behaviour, and attitude, and the financial well-being of farmers. The correlation coefficient (R = 0.815) indicates a very high degree of association between the predictors and the dependent variable. The model explains about 66.3 percent of the variation in financial well-being (R^2 = 0.663), which is substantial for social science research. The adjusted R^2 value of 0.661 confirms that the explanatory power of the model remains consistent even after adjusting for the number of predictors. The standard error of estimate (5.75) suggests that the model predicts financial well-being with a reasonable level of accuracy. The F-test result (F = 281.264, p < 0.001) further confirms that the overall model is statistically significant, meaning that the three components of financial literacy jointly have a significant influence on financial well-being. These findings highlight that improvements in farmers' financial knowledge, behaviour, and attitudes are likely to translate into better financial well-being.

The ANOVA results presented in Table 3 confirm the overall significance of the regression model examining the influence of financial literacy components on financial well-being. The F-value of 281.264, which is highly significant at the 0.001 level, indicates that the combined effect of financial knowledge, behaviour, and attitude on financial well-being is statistically robust. The large regression sum of

squares compared to the residual sum of squares further demonstrates that a substantial proportion of the variation in financial well-being is explained by the three components of financial literacy. This finding underpins that these dimensions, when considered together, are strong predictors of financial well-being among farming households in the study area.

TABLE 3. RESULTS OF ANOVA FOR THE INFLUENCE OF FINANCIAL LITERACY COMPONENTS ON FINANCIAL WELL-BEING

Model	Sum of Square	df	Mean Square	F
Regression	27906.709	3	9302.236	281.264***
Residual	14155.208	428	33.073	
Total	42061.917	431		

*Note: ***Sig at 0.001 level; Dependent variable: Financial well-being; Predictors: (Constant), Financial Knowledge, Financial behavior, financial attitude*

3.2 Impact of Financial Literacy on Financial Well-being

The previous section examined the individual components of financial literacy. It is also important to assess financial literacy as a composite construct to understand its overall effect on financial well-being. Considering financial knowledge, behaviour, and attitude together provides a holistic view of how literacy shapes financial security, decision-making, and resilience among farmers. This section evaluates the direct impact of financial literacy on financial well-being using regression analysis.

The regression results in Table 4 reveal a strong and statistically significant relationship between financial literacy and financial well-being. The correlation coefficient ($R = 0.786$) indicates a high degree of association between the two variables. The model explains 61.8 percent of the variation in financial well-being ($R^2 = 0.618$), suggesting that financial literacy alone accounts for a substantial share of the differences in farmers' financial outcomes. The adjusted R^2 value of 0.617 confirms the reliability of this explanatory power. The F-value of 695.801, significant at the 0.001 level, further validates that financial literacy as a composite construct has a powerful and meaningful impact on financial well-being among farming households.

TABLE 4. OVERALL MODEL SUMMARY FOR THE IMPACT OF FINANCIAL LITERACY ON FINANCIAL WELL-BEING

R	R Square	Adjusted R Square	Std. Error of the Estimate	Change of statistics				
				R Square Change	F Change	df1	df2	Sig. F Change
0.786ª	0.618	0.617	6.11243	0.618	695.801	1	430	0.001

Predictors: (Constant), Financial Literacy

TABLE 5. RESULTS OF ANOVA FOR THE IMPACT OF FINANCIAL LITERACY ON FINANCIAL WELL-BEING

Model	Sum of Square	df	Mean Square	F
Regression	25996.362	1	25996.362	695.801***
Residual	16065.554	430	37.362	
Total	42061.917	431		

*Note: ***Sig at 0.001 level*

The ANOVA results in Table 5 confirm that the regression model examining the impact of financial literacy on financial well-being is highly significant. The F-value of 695.801, significant at the 0.001 level, demonstrates that financial literacy as a predictor variable explains a substantial portion of the variation in financial well-being. The large regression sums of squares compared to the residual sum of squares further indicates that the model provides a strong fit, highlighting the decisive role of financial literacy in shaping the financial well-being of farmers in the study region.

3.3 Impact of Financial Literacy on Financial Well-being through Structural Equation Modelling (SEM)

Initially, regression analysis was conducted to establish the predictive relationship between financial literacy and financial well-being, and the results confirmed a strong and significant link. However, regression alone is limited in its ability to capture the complex interplay between multiple latent constructs. To address this limitation, Structural Equation Modelling (SEM) was employed as it allows for the simultaneous testing of multiple relationships, incorporation of latent variables, and separation of direct and indirect effects. This makes SEM particularly appropriate for analysing financial literacy, which is inherently multidimensional, comprising knowledge, behaviour, and attitude, and its influence on financial well-being, which is also a composite outcome. In the structural equation model, financial literacy and financial well-being are represented in the financial literacy and financial wellbeing measures, respectively (Figure 1). Factor loadings and their significance are given in Table 6.

In the evaluated SEM, Figure 1 and Table 6, financial literacy is posited as a significant predictor of financial well-being, encapsulating the composite effects of three foundational factors: financial knowledge, financial behavior, and financial attitude. Financial knowledge is assessed through eight items, financial behavior through ten items, and financial attitude through five items. Within this model, items FK4 and FK6 from the financial knowledge factor exhibit low factor loadings ($\beta < .4$, $p < 0.05$), indicating a weaker-than-desired relationship with the underlying construct. Similarly, item FB1 from the financial behavior factor also demonstrates a low factor loading ($\beta < .4$, $p < 0.05$).
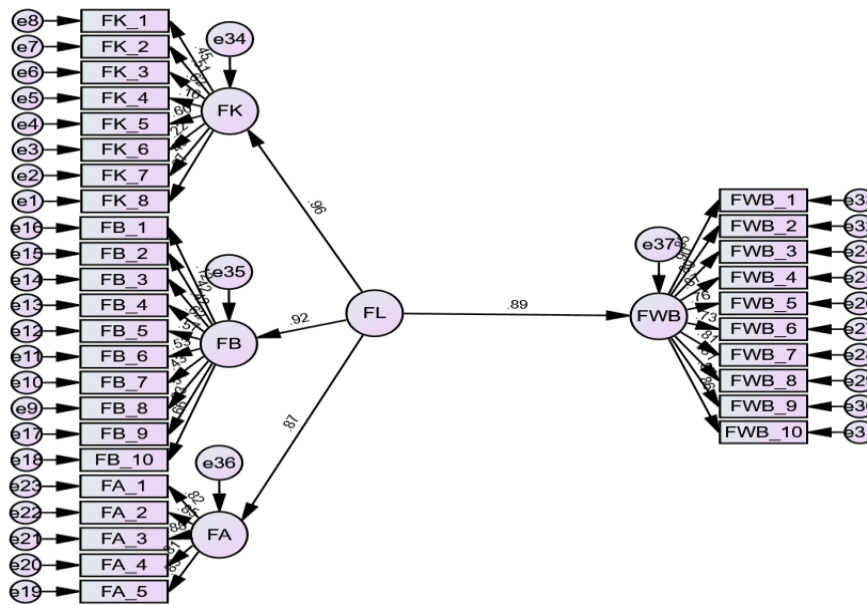
FIGURE 1. STRUCTURAL EQUATION MODELING: FINANCIAL LITERACY AS THE PREDICTOR AND
FINANCIAL WELL-BEING AS THE OUTCOME VARIABLE
Note: Figure output with standardized co-efficient by IBM-AMOS; FK- Financial Knowledge; FB- Financial
Behaviour; FA -Financial Attitude; FL-Financial Literacy; FWB, Financial Wellbeing; e, Error (residual)

Aside from these exceptions, the remaining items across the constructs display satisfactory factor loadings, ranging from 0.45 to 0.67 for financial knowledge and 0.42 to 0.66 for financial behavior, with all p-values below 0.01. Financial attitude items presented particularly strong loadings, ranging from .81 to .85 (p < 0.01), indicating a robust measurement of the construct. The structural model depicts financial literacy as being significantly influenced by financial behavior, knowledge, and attitude factors, with factor loadings ranging from 0.87 to 0.96 (p < 0.01), thus emphasizing the substantial contribution of these dimensions to the overarching concept of financial literacy. Financial literacy significantly predicts financial well-being (β = 0.89, p < 0.01), reinforcing its critical role in shaping financial outcomes.

However, the model's overall fit is a point of concern, as represented in Table 7. The Standardized Root Mean Square Residual (SRMR = 0.059) suggests an adequate fit; other indexes, including the χ^2 goodness of fit, Root Mean Square Error of Approximation (RMSEA), Goodness of Fit Index (GFI), Tucker Lewis Index (TLI), and Incremental Fit Index (IFI) indicate poor model fit.

TABLE 6. RESULTS OF SEM

Variables			B	S.E.	β	p
Endogenous		Exogenous				
FK	←	FL	1.00	--	0.96	<.01
FB	←	FL	0.74	0.08	0.92	<.01
FA	←	FL	2.81	0.21	0.87	<.01
FWB	←	FL	3.30	0.24	0.89	<.01
FK_8	←	FK	1.00	--	0.67	<.01
FK_7	←	FK	0.73	0.08	0.49	<.01
FK_6	←	FK	0.16	0.04	0.22	<.01
FK_5	←	FK	0.93	0.08	0.60	<.01
FK_4	←	FK	0.07	0.02	0.17	<.01
FK_3	←	FK	0.99	0.09	0.62	<.01
FK_2	←	FK	0.69	0.07	0.51	<.01
FK_1	←	FK	0.53	0.06	0.45	<.01
FB_8	←	FB	1.00	--	0.54	<.01
FB_7	←	FB	0.82	0.11	0.43	<.01
FB_6	←	FB	1.07	0.12	0.53	<.01
FB_5	←	FB	1.20	0.13	0.57	<.01
FB_4	←	FB	1.28	0.13	0.62	<.01
FB_3	←	FB	0.60	0.08	0.42	<.01
FB_2	←	FB	0.51	0.07	0.42	<.01
FB_1	←	FB	0.04	0.02	0.12	<.05
FB_9	←	FB	1.29	0.13	0.63	<.01
FB_10	←	FB	1.29	0.13	0.66	<.01
FA_5	←	FA	1.00	--	0.83	<.01
FA_4	←	FA	0.92	0.05	0.81	<.01
FA_3	←	FA	1.16	0.05	0.88	<.01
FA_2	←	FA	1.07	0.05	0.85	<.01
FA_1	←	FA	1.03	0.05	0.82	<.01
FWB_3	←	FWB	1.00	--	0.89	<.01
FWB_4	←	FWB	0.96	0.04	0.87	<.01
FWB_5	←	FWB	0.75	0.04	0.76	<.01
FWB_6	←	FWB	0.73	0.04	0.73	<.01
FWB_7	←	FWB	0.77	0.03	0.81	<.01
FWB_8	←	FWB	0.81	0.04	0.81	<.01
FWB_9	←	FWB	0.88	0.03	0.87	<.01
FWB_10	←	FWB	0.95	0.04	0.86	<.01
FWB_2	←	FWB	0.97	0.03	0.90	<.01
FWB_1	←	FWB	0.93	0.04	0.85	<.01

FA, financial attitude; FB, financial behavior; FK, financial knowledge; FWB, financial well-being

To address these discrepancies and improve the model's alignment with empirical data, modification indices from AMOS have been consulted, eliminating items with high covariances contributing to poor model fit. Specifically, items FK4, FB2, FB7, and FB10 from financial literacy and FWB6, FWB7, FWB9, and FWB10

are removed from the model. This step was taken carefully to retain items central to the theoretical constructs aimed to measure. Through these modifications, an effort is made to balance empirical adequacy with theoretical integrity, aiming to enhance the model's overall explanatory power while preserving the core conceptual underpinnings of the financial literacy construct.

TABLE 7. MODEL FIT INDICES FOR SEM

Indices	Value
χ^2 (Chi-Square Value)	2281.52
df	491
χ^2/df (Chi-Square/df)	4.647
RMSEA	0.092
CFI	0.811
TLI	0.797
IFI	0.812
SRMR	0.059
LO90	0.088
HI90	0.096

Note: B = unstandardized coefficient, SE = standard error, β = standardized coefficient, p = probability, RMSEA = root mean square error of approximation; LO = lower limit; HI = upper limit; CFI = Comparative Fit Index; TLI = Tucker Lewis index; IFI = Incremental Fit Index; SRMR = Standardized Root Mean Square Residual; χ2 = model chi-square; df = degrees of freedom.
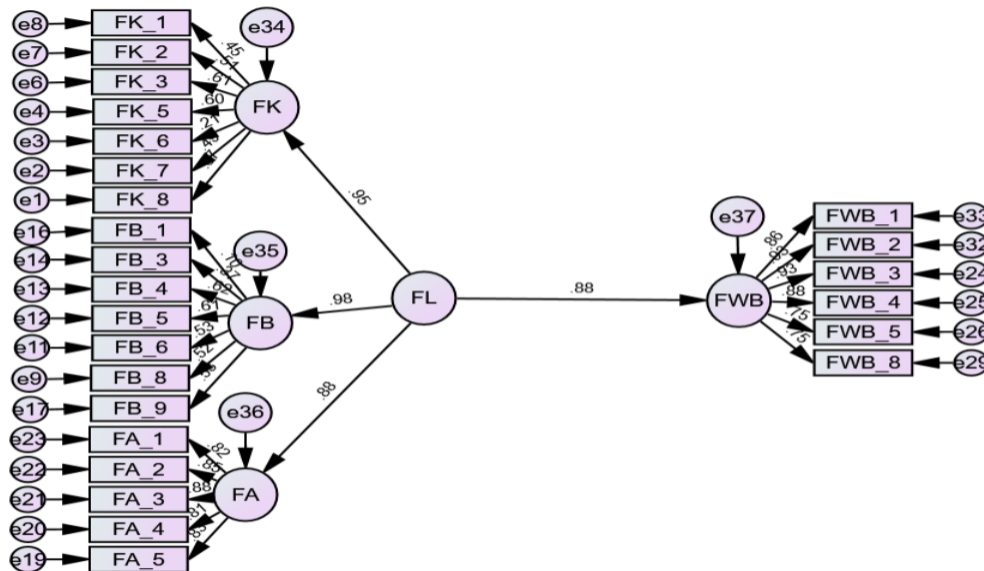

FIGURE 2. MODIFIED SEM WITH BETTER-FIT INDICES AFTER REMOVING THE ITEMS THAT SHOWED HIGH CO-VARIANCE

In Table 8, items FK6, FB1, and FB3 are retained within the model despite their poor factor loadings ($\beta < 0.4$ p< 0.5), a decision predicated on theoretical considerations and the anticipated negative impact their removal could have on the model's overall fitness. This approach emphasizes the balance between empirical and theoretical justifications in model construction, where certain items, despite statistical underperformance, are considered essential for the theoretical completeness and integrity of the constructs they represent.

TABLE 8. RESULTS OF MODIFIED SEM

Variables (Endogenous)		Exogenous	B	S.E.	β	p
FK	←	FL	1.00	--	0.95	<.01
FB	←	FL	0.76	0.08	0.98	<.01
FA	←	FL	2.87	0.22	0.88	<.01
FWB	←	FL	3.44	0.25	0.88	<.01
FK_8	←	FK	1.00	--	0.67	<.01
FK_7	←	FK	0.72	0.08	0.49	<.01
FK_6	←	FK	0.15	0.04	0.21	<.01
FK_5	←	FK	0.93	0.08	0.61	<.01
FK_3	←	FK	0.98	0.09	0.61	<.01
FK_2	←	FK	0.69	0.07	0.51	<.01
FK_1	←	FK	0.53	0.06	0.45	<.01
FB_8	←	FB	1.00	--	0.52	<.01
FB_6	←	FB	1.13	0.13	0.53	<.01
FB_5	←	FB	1.35	0.15	0.61	<.01
FB_4	←	FB	1.34	0.14	0.62	<.01
FB_3	←	FB	0.55	0.08	0.37	<.01
FB_1	←	FB	0.03	0.02	0.11	<.05
FB_9	←	FB	1.13	0.13	0.53	<.01
FA_5	←	FA	1.00	--	0.83	<.01
FA_4	←	FA	0.92	0.05	0.81	<.01
FA_3	←	FA	1.17	0.05	0.88	<.01
FA_2	←	FA	1.08	0.05	0.85	<.01
FA_1	←	FA	1.04	0.05	0.82	<.01
FWB_3	←	FWB	1.00	--	0.93	<.01
FWB_4	←	FWB	0.94	0.03	0.88	<.01
FWB_5	←	FWB	0.71	0.04	0.75	<.01
FWB_8	←	FWB	0.73	0.04	0.75	<.01
FWB_2	←	FWB	0.97	0.03	0.93	<.01
FWB_1	←	FWB	0.91	0.03	0.86	<.01

Regarding the other items assessed, they exhibit satisfactory factor loadings within their respective domains—ranging from 0.45 to 0.67 for financial knowledge, 0.45 to 0.62 for financial behavior, 0.81 to 0.85 for financial attitude, and 0.75 to 0.93 for financial well-being—with all p-values below the 0.01 threshold, thereby indicating strong and statistically significant relationships with their respective constructs. This strong association confirms the relevance and contribution of these items to their respective domains within the context of financial literacy. The analysis further reveals that the constructs of financial behavior, financial knowledge, and financial attitude are significantly associated with financial literacy, with factor loadings ranging from 0.88 to 0.98 ($p < 0.01$), emphasizing the substantial influence these components exert on the overarching concept of financial literacy. Notably, financial literacy emerged as a significant predictor of financial well-being ($\beta = 0.88$, $p < 0.01$), reinforcing the conceptual linkage and importance of financial literacy as a determinant of financial well-being.

In Table 8, items FK6, FB1, and FB3 are retained within the model despite their poor factor loadings ($\beta < 0.4$ $p < 0.5$), a decision predicated on theoretical considerations and the anticipated negative impact their removal could have on the model's overall fitness. This approach emphasizes the balance between empirical and theoretical justifications in model construction, where certain items, despite statistical underperformance, are considered essential for the theoretical completeness and integrity of the constructs they represent. Regarding the other items assessed, they exhibit satisfactory factor loadings within their respective domains—ranging from 0.45 to 0.67 for financial knowledge, 0.45 to 0.62 for financial behavior, 0.81 to 0.85 for financial attitude, and 0.75 to 0.93 for financial well-being—with all p-values below the 0.01 threshold, thereby indicating strong and statistically significant relationships with their respective constructs. This strong association confirms the relevance and contribution of these items to their respective domains within the context of financial literacy. The analysis further reveals that the constructs of financial behavior, financial knowledge, and financial attitude are significantly associated with financial literacy, with factor loadings ranging from 0.88 to 0.98 ($p < 0.01$), emphasizing the substantial influence these components exert on the overarching concept of financial literacy. Notably, financial literacy emerged as a significant predictor of financial well-being ($\beta = 0.88$, $p < 0.01$), reinforcing the conceptual linkage and importance of financial literacy as a determinant of financial well-being.

In Figure 3 and Table 9, the model's fit is evaluated using various indices. The Root Mean Square Error of Approximation (RMSEA) stood at 0.069, suggesting a partial but acceptable model fit within the context of social science research. The Standardized Root-mean Square Residual (SRMR) value is 0.046, aligning with conventional criteria for good fit (below 0.08). The χ^2/df ratio is 3.054, indicative of an adequate fit as values below 5 are typically acceptable. The Comparative Fit Index

(CFI), Tucker Lewis Index (TLI), and Incremental Fit Index (IFI) were 0.910, 0.901, and 0.911, respectively, all exceeding the 0.90 threshold and thus confirming the model's adequacy in fitting the observed data. These indices collectively affirm the structural model's validity. However, they also highlight areas for improvement and the complex judgment required in balancing statistical and theoretical considerations

TABLE 9. MODEL FIT INDICES FOR SEM

Indices	Value
χ^2 (Chi-Square Value)	827.67
df	271
χ^2/df (Chi-Square/df)	3.054
RMSEA	0.069
CFI	0.910
TLI	0.901
IFI	0.911
SRMR	0.046
LO90	0.064
HI90	0.074

Source: Author's own

in model development and evaluation. Considering financial knowledge, behavior, and attitude as observed variables of the latent variable of financial literacy, SEM is employed to determine whether financial literacy predicts financial well-being.
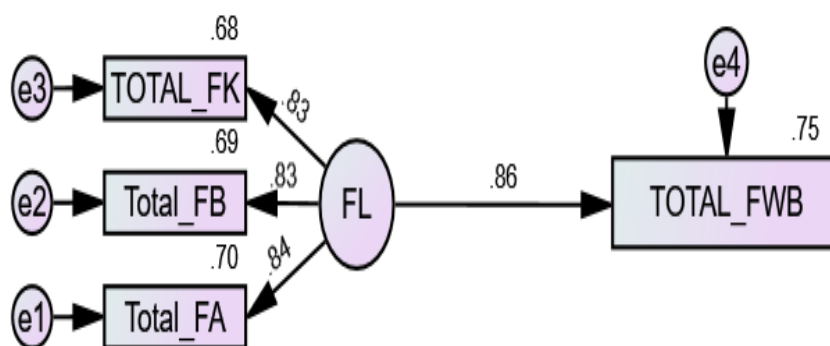

FIGURE 3. SEM: ADDING TO THE LATENT VARIABLE OF FINANCIAL LITERACY AS THE PREDICTOR OF FINANCIAL WELL-BEING

In Table 10, the constructs of financial attitude, financial behavior, and financial knowledge are each found to have substantial and statistically significant loadings on the overarching concept of financial literacy, with coefficients (β) of 0.839, 0.832, and 0.826, respectively, all demonstrating p-values less than 0.01. These findings

align closely with those from previous models, reinforcing the robustness of financial literacy as a multidimensional construct composed of these key components. The strong factor loadings indicate that attitude, behavior, and knowledge contribute significantly to the composite measure of financial literacy, underscoring their integral roles within the conceptual framework. Moreover, the model shows a significant relationship between financial literacy and financial well-being, with a predictive coefficient (β) of 0.865 (p < 0.01) and an explained variance (r^2) of 0.75. This substantial relationship highlights the critical role that financial literacy plays in influencing financial well-being, suggesting that enhancements in an individual's financial knowledge, behaviors, and attitudes could lead to considerable improvements in their financial well-being.

TABLE 10. RESULTS OF SEM: ADDING TO THE LATENT VARIABLE OF FINANCIAL LITERACY AS THE PREDICTOR OF FINANCIAL WELL-BEING

Variables			B	S.E.	β	P
Endogenous		Exogenous				
FA	←	FL	1	--	0.839	<.01
FB	←	FL	2.322	0.114	0.832	<.01
FK	←	FL	1.745	0.086	0.826	<.01
FWB	←	FL	9.729	0.452	0.865	<.01

In Table 11, the Root Mean Square Error of Approximation (RMSEA) value is recorded at 0.069, indicating a partial fit that nonetheless falls within acceptable bounds for social science research, particularly in the context of complex models. The Standardized Root Mean Square Residual (SRMR) value is notably low at 0.024,

TABLE 11. MODEL FIT INDICES OF SEM

Indices	Value
χ^2 (Chi-Square Value)	26.52
df	2
χ^2/df (Chi-Square/df)	13.261
RMSEA	0.169
CFI	0.978
TLI	0.934
IFI	0.978
SRMR	0.024
*LO*90	0.115
*HI*90	0.229

suggesting a good fit between the model and the observed data. Furthermore, the Comparative Fit Index (CFI), Tucker Lewis Index (TLI), and Incremental Fit Index (IFI) presented values of 0.978, 0.934, and 0.978, respectively, all of which substantially exceed the commonly accepted threshold of 0.90, thereby indicating an excellent fit of the model to the data. These fit indices collectively suggest that the structural model is well-constructed and offers a reliable framework for understanding the interrelations between financial literacy components and financial well-being. This alignment with theoretical expectations and empirical data emphasizes the model's validity and reinforces the centrality of financial literacy in the financial well-being domain.

IV

DISCUSSION

Financial literacy is a remarkably powerful predictor of financial well-being among farming households. Financial knowledge, behaviour, and attitude, accounting for over sixty percent of variance in well-being accentuates that, in rural agricultural settings, these dimensions are not peripheral but central to how households manage risk, allocate resources, and plan for their economic futures. The composite construct of financial literacy shows similarly strong explanatory power, corroborating what recent empirical work suggests: the integration of good financial practices, sound attitudes, and basic financial knowledge produces outcomes far superior to those predicted by any single component alone (Lusardi & Mitchell, 2014; Agarwal et al., 2021). The high factor loadings across knowledge, behaviour, and attitude show that financial literacy is more than factual understanding; it is an orientation, an ensemble of habits, confidence, and mindset. The way farmers think about money, plan for seasonal demands, anticipate shocks, and act (or fail to act) in their financial lives has substantial material consequences. Human capital has long been recognized as including information, risk preferences, and behavioural patterns. The empirical strength of these latent effects here supports that tradition (Xiao & O'Neill, 2018).

In contexts characterized by high exposure to agricultural risk, weather variability, pest pressures, input and output price fluctuations, and market failures financial literacy serves both protective and enabling functions. On the protective side, literacy allows farming households to anticipate and smooth seasonal cash flow, maintain savings buffers, and adopt insurance or other risk-mitigation mechanisms. On the enabling side, literacy empowers households to Take informed investment decisions, whether to adopt improved seeds, diversify crops, or pursue non-farm income sources. These decisions alter production possibilities and, cumulatively, can shift households' production frontier outward, a dynamic long theorized in agricultural household models (Binswanger & Rosenzweig, 1986; Ray, 1998).

The current results also illuminate how financial literacy interacts with credit markets. Rural credit markets in many developing countries settings, including India,

remain imperfect. Small holders depend on informal lenders who lend at high interest, enforce stringent terms, or exploit information asymmetries. Formal credit access is heavily conditioned on farmers' awareness, literacy, and landholding characteristics (Chavan & Ramakumar, 2021). Financial literacy, by improving farmers' capacity to assess loan terms, compare across sources, manage repayment schedules, and navigate formal institutions, enables more favourable borrowing conditions, reducing cost and risk. The strength of literacy in predicting well-being in this study thus likely reflects not just direct effects but also its enabling role in unlocking affordable credit.

Insurance adoption, particularly crop insurance, is another area where financial literacy play a crucial role. Despite government schemes such as the Pradhan Mantri Fasal Bima Yojana, participation remains low because of limited understanding of policy terms, distrust of insurers, delay in claim settlement process and, lack of awareness of claims processes (Biswal, 2022). Similarly, farm-level studies show that literacy, farm size, risk perceptions, and institutional support are significant predictors of adoption (Aditya et al., 2018). Financial attitudes and behaviour load strongly in the literacy construct and predict well-being. The implication is that, beyond knowledge, farmers' willingness to trust and engage with such products is decisive.

Savings behaviour further illustrates the importance of literacy. Households with disciplined financial practices are more likely to build precautionary savings, which serve as self-insurance when formal safety nets are incomplete. These buffers enable them to avoid distress sales of produce, reduce dependence on emergency borrowing, and maintain consumption during lean seasons. The behavioural component of literacy captured in this study reflects precisely such practices, and the strong explanatory power of behaviour in the models confirms the proposition in agricultural economics that precautionary savings are critical to resilience (Dercon, 2002). For marginal and smallholders, literacy may primarily enhance subsistence security by reducing debt burdens and stabilizing income flows, while for medium and large farmers it can enable more ambitious investments, diversification, and engagement with formal markets. Similarly, gender differences are crucial. Women farmers, who often lack formal land titles and face barriers to credit, are nonetheless key decision-makers in household finances. When women gain financial literacy, resources are more effectively channelled into education, nutrition, and farm investment (Swain & Wallentin, 2009). The strong attitudinal and behavioural linkages found in this study reinforce the argument for gender-sensitive interventions as a lever for improving both household welfare and agricultural productivity.

Expanding access to formal products without equipping households to use them effectively risks underutilization or even harm. Literacy reduces the information asymmetries that otherwise distort credit allocation and insurance adoption, thereby strengthening rural financial markets. Over time, financially literate farmers

contribute to the stability of rural institutions by maintaining repayment discipline, adopting diverse financial instruments, and demanding transparency. The cumulative effect is a virtuous cycle: household well-being improves, rural institutions become more resilient, and agricultural productivity rises. Such outcomes align with India's broader inclusive growth agenda, which emphasizes both financial inclusion and sustainable agricultural development. International evidence supports these conclusions. In Sub-Saharan Africa, financial education improved savings behaviour when paired with accessible savings products (Dupas & Robinson, 2013). In India, insurance education only translated into higher enrolment when products were transparent and claim processes reliable (Gina, Townsend, & Vickery, 2008). These parallels confirm that literacy is most powerful when embedded in supportive institutional environments. It is necessary but not sufficient: knowledge and skills must be matched with accessible, trustworthy financial products.

Financial literacy comprising knowledge, behaviour, and attitude, is not merely one among many influences on farmers' financial well-being but one of the most potent. It shapes how households respond to uncertainty, how they manage credit, savings, and insurance, and how they convert knowledge into practice. The unusually high explanatory values are not artifacts but reflections of genuine influence. In the context of rural India, financial literacy thus emerges as a linchpin in pathways to well-being, with implications that extend from household decision-making to the stability of rural financial systems and the sustainability of agricultural development.

V

CONCLUSION

The study establishes financial literacy as a powerful determinant of farmers' financial well-being, demonstrating that knowledge, behaviour, and attitude collectively shape households' ability to manage resources, cope with risks, and secure economic resilience. These components together explain a substantial share of variation in well-being. Financial literacy is a strong latent construct with consistently strong predictive effects. Literacy is not confined to cognitive knowledge but extends to attitudinal orientations and behavioural practices that directly influence saving, borrowing, and investment decisions. Financial literacy functions both as a protective capability, enabling households to mitigate vulnerabilities in uncertain agrarian environments, and as an enabling resource that allows them to exploit opportunities for productivity and income growth. By reducing information asymmetries, enhancing credit discipline, and enhancing trust in formal institutions, literacy strengthens rural financial markets while improving household welfare. Financial literacy should be regarded as a central element of rural development strategies, capable of enhancing resilience and inclusive growth in India's agrarian economy.

VI

LIMITATIONS AND POLICY IMPLICATIONS

The study makes a significant contribution. Several limitations warrant acknowledgment. The cross-sectional design restricts the ability to establish causality. Although the associations between financial literacy and financial well-being are strong, reverse causality remains plausible: households with higher well-being may invest more in acquiring financial knowledge or display more disciplined behaviours. Longitudinal studies or experimental interventions would be necessary to confirm the temporal direction of effects. In addition, reliance on self-reported data introduces risks of recall bias and social desirability bias, particularly concerning borrowing and savings practices. Although structural equation modelling provides a robust framework for examining latent constructs, some items showed weak loadings, reflecting potential misalignment between standardized indicators and the realities of farming households. Finally, the study focuses on one regional context, and while the findings resonate with broader literature, the diversity of India's agrarian economy means that replication across different agro-ecological zones is essential to test generalizability.

Despite these limitations, the policy implications are clear. First, financial literacy must be integrated into rural development strategies, not treated as a stand-alone intervention. Programs should move beyond didactic, one-off workshops toward participatory, practice-oriented approaches such as crop-cycle budgeting, interactive insurance simulations, and peer group savings exercises. Second, interventions must address heterogeneity among farmers. For smallholders, literacy programs may focus on debt management and risk coping, while for larger farmers, emphasis can be on investment and diversification strategies. Gender-sensitive approaches are especially important, as women farmers face distinct barriers yet stand to generate substantial welfare gains from literacy interventions. Third, supply-side reforms must complement demand-side literacy. Affordable credit, simplified insurance contracts, and transparent savings instruments are essential if knowledge is to translate into behaviour. Finally, rigorous evaluation must be embedded into program design. Randomized controlled trials, longitudinal follow-ups, and the inclusion of both subjective and objective indicators (such as savings balances or credit repayment records) will ensure that policies achieve durable improvements in financial well-being. Financial literacy emerges as a vital determinant of household resilience and sectoral stability in agriculture. By embedding literacy programs within broader financial inclusion and agricultural development strategies, policymakers can leverage its potential not only to enhance individual well-being but also to strengthen rural financial systems and support inclusive growth in India's farming sector.

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