Kuwait Research Journal of
Business Management (KRJBM)

ISSN Print: 2790-6590 | ISSN Online : 2790-6582 Open Access

Trust and Information Sharing as Drivers of Supply Chain Performance: Evidence from Horticulture Farmers in Jammu and Kashmir

Raja Haamid Zamir[1], Prof. Iqbal Ahmad Hakim[2]
[1]Research Scholar, Department of Management Studies, University of Kashmir Correspondence: rajahaamidzamir@gmail.com
[2]Professor, Department of Management Studies, University of Kashmir Correspondence: prof.iqbal.hakim@gmail.com

*Corresponding Author

Raja Haamid Zamir
Research Scholar, Department of Management Studies, University of Kashmir
rajahaamidzamir@gmail.com

Article History
Received: 05.04.2026
Revise : 20.04.2026
Accepted: 25.04.2026
Published: 04.05.2026

DOI:10.61705/KRJBM.2.2.2026.32.51

Keywords: Trust, Information Sharing, Supply Chain Performance, Reliability, Responsiveness, Agility, Asset Management, Cost Reduction Horticulture, Jammu and Kashmir, PLS-SEM, Agri-food

Abstract: Purpose – This study investigates the influence of trust (trustworthiness) and information sharing on supply chain performance (SCP) in the horticulture sector of Jammu and Kashmir (J&K), India. Supply chain inefficiencies, largely rooted in relational deficits and poor information flows, continue to undermine the competitiveness of smallholder horticulture farmers. Drawing on the Resource-Based View (RBV) and Social Exchange Theory (SET), this paper examines how trust and information sharing shape key SCP dimensions- reliability, responsiveness, agility, asset management and cost reduction. Design/methodology/approach – A descriptive, exploratory and cross-sectional research design was employed. Primary data were collected from 395 horticulture farmers across six major mandis in J&K using a multistage cluster sampling technique. Structural Equation Modelling (SEM) via Partial Least Squares (PLS-SEM) in Smart-PLS was used to test the hypotheses. The measurement model was validated through confirmatory factor analysis assessing reliability, convergent validity and discriminant validity. Findings – All hypotheses were supported. Trust exerted a strong positive effect on overall SCP (β=0.371, $p<0.001$), with particularly strong influence on agility (β=0.453) and cost reduction (β=0.571). Information sharing significantly influenced SCP (β=0.453, $p<0.001$), demonstrating its strongest effect on reliability (β=0.560) and agility (β=0.472). All Cronbach's alpha and composite reliability values exceeded 0.77 and average variance extracted (AVE) surpassed the 0.50 threshold across all constructs, confirming robust measurement quality. Research limitations/implications – The study is cross-sectional and limited to J&K; longitudinal and multi-regional designs could strengthen generalisability. Findings offer practical guidance to policymakers and mandi administrators to institutionalise trust-building mechanisms and information sharing platforms. Practical implications – Strengthening interpersonal trust and digitising market information flows can substantially enhance supply chain responsiveness, agility and cost efficiency for horticulture farmers operating in J&K's unique socio-geographic conditions. Originality/value – This is among the first empirical studies to apply PLS-SEM to examine trust and information sharing as co-drivers of multi-dimensional SCP in an agricultural context, specifically within J&K's horticulture supply chains.

Introduction

Agricultural supply chains in developing economies face persistent challenges rooted in fragmented production structures, poor market linkages and asymmetric information flows (Narrod et al., 2009;

ISSN Print: 2790-6590 | ISSN Online : 2790-6582 Open Access

Trebbin, 2014). In horticultural value chains, where product perishability is high and price volatility is pronounced, these challenges become particularly acute. Jammu and Kashmir (J&K), recognised as one of India's premier horticulture regions, produces apple, saffron, cherry, walnut and other high-value crops that sustain the livelihoods of over 1.44 million farm households (JKHPMD, 2023). Yet the region's supply chains remain characterised by excessive intermediation, post-harvest losses and insufficient coordination among chain actors (Baba et al., 2020). Against this backdrop, two relational constructs trust and information sharing, have emerged as central enablers of supply chain performance (SCP) in global supply chain scholarship (Cao & Zhang, 2011; Nyaga et al., 2010). Trust reduces opportunistic behaviour, lowers transaction costs and facilitates long-term cooperative relationships between farmers and buyers (Kwon & Suh, 2004; Morgan & Hunt, 1994). Information sharing, on the other hand, synchronises supply and demand, reduces uncertainty and enables proactive decision-making throughout the chain (Li et al., 2006; Prajogo & Olhager, 2012). Despite their theoretical importance, few empirical studies have examined how these relational antecedents simultaneously affect the multiple dimensions of SCP in the context of smallholder horticulture farming in South Asia.

This study addresses this gap by investigating the effects of trust and information sharing on five dimensions of SCP-reliability, responsiveness, agility, asset management and cost reduction, among horticulture farmers across J&K's major regulated fruit and vegetable markets (mandis). Using a robust PLS-SEM approach on survey data from 395 farmers, this paper makes three specific contributions. First, it provides empirical evidence of the differential effects of trust and information sharing across distinct SCP dimensions in an agri-food context. Second, it validates a comprehensive measurement model tailored to the socio-institutional realities of J&K horticulture. Third, it generates actionable insights for market administrators, policymakers and farmer cooperatives. The remainder of this paper is structured as follows. Section 2 reviews the theoretical and empirical literature. Section 3 presents the conceptual framework and hypotheses. Section 4 details the research methodology. Section 5 reports the findings. Sections 6 and 7 provide the discussion and conclusion, respectively.

1.1 Research Objectives

The study is guided by two principal research objectives:

1: To examine the effect of trust on supply chain performance in the horticulture sector of Jammu and Kashmir.

2: To analyse the impact of information sharing on supply chain performance in the horticulture sector of Jammu and Kashmir.

1.2 Research Questions

Guided by the above objectives, the study seeks to answer the following research questions:

RQ1: What is the effect of trust on supply chain performance in the horticulture sector of Jammu and Kashmir?

RQ2: How does information sharing influence supply chain performance among horticulture farmers in Jammu and Kashmir?

RQ3: How does trust influence the dimensions of supply chain performance- reliability, responsiveness, agility, asset management and cost reduction, in the horticulture sector of Jammu and Kashmir?

RQ4: How does information sharing influence the dimensions of supply chain performance - reliability, responsiveness, agility, asset management and cost reduction, in the horticulture sector of Jammu and Kashmir?

These research questions directly map onto the hypotheses developed in Section 3 and are operationalised through the PLS-SEM analytical framework detailed in Section 4.

2. Literature Review

2.1 Supply Chain Performance and Its Dimensions

Supply chain performance (SCP) refers to the degree to which a supply chain meets end-customer requirements while maintaining operational efficiency and competitive advantage (Gunasekaran et al., 2004; Beamon, 1999). The

ISSN Print: 2790-6590 | ISSN Online : 2790-6582 Open Access

Supply Chain Operations Reference (SCOR) model, developed by the Supply Chain Council (2012), conceptualises SCP through five dimensions: reliability, responsiveness, agility, asset management and cost reduction. This multidimensional framing has been widely adopted in agri-food supply chain research (Özkanisoy & Bulutlar, 2023; Aramyan et al., 2007) and continues to inform contemporary empirical studies that evaluate supply chain capabilities in turbulent and data-intensive environments (Bag et al., 2022; Singh et al., 2024). Reliability refers to the supply chain's ability to deliver products in accordance with agreed specifications (quality, quantity and timing) consistently and predictably (Gunasekaran et al., 2004). Responsiveness captures the speed with which the supply chain adapts to changing customer requirements, market signals and unexpected disruptions (Christopher, 2011). Agility reflects the capacity to reconfigure supply chain resources and processes rapidly in response to environmental turbulence (Swafford et al., 2006; Gligor et al., 2019). Asset management efficiency encompasses how effectively physical resources-storage, transportation, machinery, are utilised to support supply chain operations (Özkanisoy & Bulutlar, 2023). Cost reduction captures the ability to minimise operational, transaction and logistics costs across the chain (Li et al., 2006). Recent scholarship has emphasised that these dimensions are increasingly inter-dependent in post-pandemic and technology-mediated supply chain environments (Ivanov, 2022; Queiroz et al., 2024). In the horticulture context, these dimensions are particularly pertinent. Supply chain disruptions from climate variability to demand shocks, require agile and responsive chain governance structures (Kumar et al., 2022; Mandal et al., 2024). Belhadi et al. (2024) argue that smart operations management, integrating digital tools with relational governance, is becoming essential for smallholder agri-food supply chains in developing economies. Asset management bears directly on post-harvest infrastructure, while cost reduction shapes the net margins available to smallholder farmers facing structural market power asymmetries (Yadav et al., 2024).

2.2 Trust in Supply Chain Relationships

Trust has been conceptualised as a willingness to be vulnerable to another party based on positive expectations of their behaviour (Mayer et al., 1995). In supply chain management, trust has been operationalised as a multi-dimensional construct encompassing competence trust (belief in a partner's ability), benevolence trust (belief in a partner's goodwill) and integrity trust (belief in a partner's honesty) (Dyer & Chu, 2003; Svensson, 2001). Morgan and Hunt's (1994) seminal Commitment-Trust Theory established trust as a cornerstone of relational exchange, reducing uncertainty and enabling long-term partnerships. Empirical evidence consistently links trust to improved SCP across multiple industries and geographies. Nyaga et al. (2010) demonstrated that trust fosters collaborative activities joint planning, joint problem-solving, that directly enhance supply chain efficiency. Kwon and Suh (2004) found that trust reduces opportunism and transaction costs, thereby improving supply chain coordination. Cao and Zhang (2011) confirmed that supply chain collaboration, built on a foundation of trust, significantly enhances competitive advantage. More recently, Furqan et al. (2023) found trust to be a significant predictor of vertical coordination and SCP in agri-food chains in Pakistan. Gölgeci et al. (2019) established that inter-firm trust facilitates dynamic capabilities including agility in turbulent supply chain environments. Gölgeci et al. (2023), in a comprehensive bibliometric analysis of over two decades of inter-organisational trust research, confirmed that trust remains the most consistently significant relational antecedent of supply chain performance across diverse institutional contexts. Contemporary supply chain disruptions including pandemic shocks and geopolitical instability have reinvigorated scholarly interest in trust as a resilience mechanism. Belhadi et al. (2022) demonstrated that artificial intelligence-mediated innovations strengthen trust-based supply chain dyads, particularly under conditions of dynamism. Singh et al. (2024) empirically confirmed that trust-based relationships between supply chain partners positively moderate the effect of institutional pressures on agility and responsiveness in

ISSN Print: 2790-6590 | ISSN Online : 2790-6582 Open Access

manufacturing supply chains. Queiroz et al. (2024) found that in the context of COVID-19 disruptions, organisations with higher inter-firm trust exhibited significantly faster supply chain recovery and superior resilience outcomes. These findings collectively affirm that trust is not merely a background condition but an active strategic resource in supply chain governance.

In agricultural supply chains, trust is particularly salient because formal contracting mechanisms are weak and relationships are predominantly informal and interpersonal (Trebbin, 2014). Farmers' willingness to disclose production information, honour delivery commitments and invest in relationship-specific assets is contingent on the trust they place in buyers (Narrod et al., 2009). In J&K's horticulture sector, where farmer-buyer relationships often span generations and are embedded in local social networks, trust constitutes a foundational relational resource whose cultivation has direct implications for the reliability, agility and cost efficiency of horticulture supply chains (Baba et al., 2020; Khan et al., 2024).

2.3 Information Sharing in Supply Chains

Information sharing refers to the timely and accurate exchange of demand, supply and operational data among supply chain partners (Li et al., 2006). Drawing on information processing theory (Galbraith, 1973), scholars have argued that effective information sharing reduces uncertainty, facilitates coordination and enables proactive response to demand fluctuations (Zhao et al., 2013). The advent of digital communication technologies like smartphones, mobile applications and internet-based market platforms, has dramatically lowered the cost of information exchange in agricultural value chains (Forman & McElheran, 2023; Jensen, 2007). Li et al. (2006) conducted one of the first large-scale empirical studies demonstrating that information sharing positively influences SCP across reliability, flexibility and responsiveness dimensions. Prajogo and Olhager (2012) extended this finding by showing that supply chain information integration mediates the relationship between operational practices and performance. More recently, Wamba et al. (2022) demonstrated that blockchain-enabled information sharing significantly strengthens supply chain performance by ensuring traceability, transparency and data integrity across chain actors. Wamba and Queiroz (2024) further showed that artificial intelligence-driven information sharing platforms substantially augment supply chain resilience by enabling real-time demand sensing and predictive analytics, thereby reducing the bullwhip effect and improving responsiveness. In the context of agri-food supply chains, Trienekens (2011) highlighted that asymmetric market information particularly regarding prices, quality standards and demand volumes, is a primary source of inefficiency and farmer marginalisation. Studies by Aker (2010) and Jensen (2007) in developing country contexts demonstrate that access to market price information significantly improves farmer bargaining power and income. Recent research has emphasised the role of digital information platforms and WhatsApp-based communication networks in facilitating real-time information exchange between farmers, aggregators and buyers in South Asian agricultural markets (Donner & Escobari, 2010; Nakasone et al., 2014). Forman and McElheran (2023) argue that information sharing quality encompassing accuracy, timeliness and relevance, moderates the relationship between digital adoption and supply chain outcomes. In J&K's horticulture sector, where mandi prices fluctuate rapidly and climate-induced supply variability is high, information sharing is a critical enabler of market participation and SCP improvement (Baba et al., 2020). Yadav et al. (2024) found that digital technology adoption barriers including limited digital literacy and infrastructure gaps, constrain information sharing in developing country agri-food supply chains, underscoring the need for context-sensitive information sharing interventions. Kamble et al. (2022) argue that digital twin technologies, by creating real-time information mirrors of physical supply chain operations, offer a transformative mechanism for improving supply chain agility and asset utilisation efficiency in perishable goods chains. Kumar et al. (2022) further demonstrated that information transparency in perishable food supply chains significantly mitigates risks associated with demand uncertainty and supply disruptions.

ISSN Print: 2790-6590 | ISSN Online : 2790-6582 Open Access

2.4 Theoretical Foundations

This study is anchored in two complementary theoretical frameworks. The Resource-Based View (RBV) of the firm (Barney, 1991; Grant, 1991) provides the basis for understanding trust and information sharing as strategic relational resources that are valuable, rare, inimitable and non-substitutable. In the supply chain context, Dyer and Singh (1998) extended the RBV to the relational view, arguing that inter-firm relational resources including trust and routinised information exchange, generate relational rents that enhance supply chain competitiveness. Recent extensions of the relational view underscore that in an era of digital transformation and supply chain disruptions, the combination of relational trust and information sharing capabilities constitutes a form of dynamic relational capability that sustains competitive performance under turbulent conditions (Belhadi et al., 2022; Singh et al., 2024). Supply chain members who cultivate and leverage these relational assets are better positioned to achieve superior performance across reliability, responsiveness and cost dimensions. Social Exchange Theory (SET) (Blau, 1964; Emerson, 1976) complements the RBV by explaining the behavioural mechanisms through which trust and information sharing translate into performance outcomes. SET posits that social actors engage in exchange relationships with the expectation of reciprocal benefits. In supply chain contexts, when farmers trust buyers to provide fair prices and timely payments, they reciprocate by sharing accurate production information and honouring delivery commitments, creating a virtuous cycle of mutual benefit and improved chain performance (Nyaga et al., 2010; Morgan & Hunt, 1994). Gölgeci et al. (2023) provide recent bibliometric evidence confirming that SET remains the dominant theoretical lens applied in inter-organisational trust research, with its explanatory power extending across developed and developing country contexts. Similarly, Queiroz et al. (2024) invoke SET to explain why supply chains with high pre-existing trust levels recover more swiftly from disruptions, a finding directly pertinent to the J&K horticulture context where relationship continuity across growing seasons is critical. SET thus helps explain the relational dynamics underpinning both hypothesised relationships in this study.

2.5 Research Gap and Study Positioning

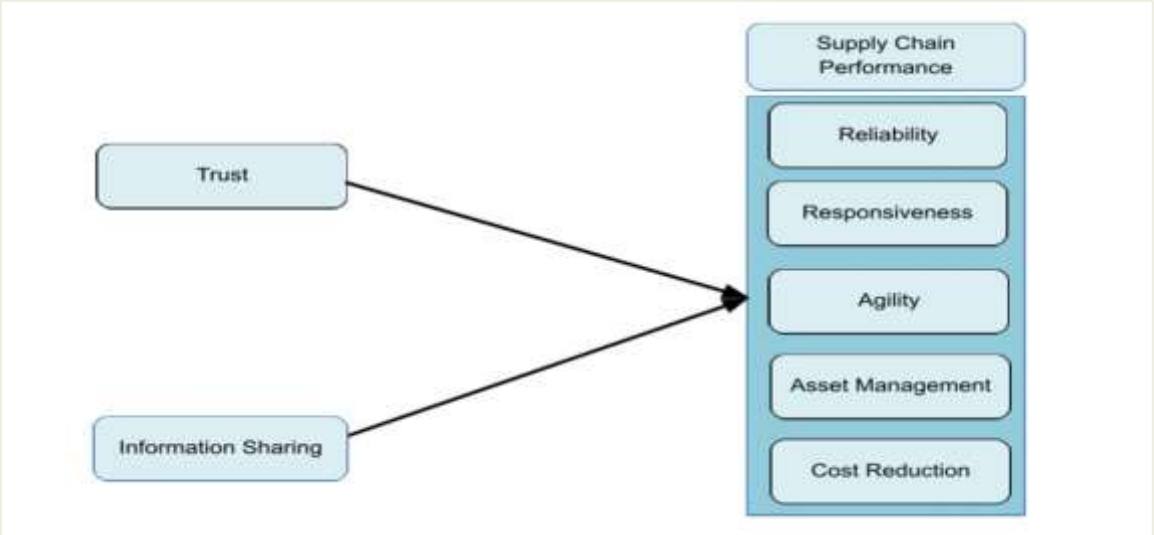
Despite the growing body of literature on trust and information sharing in supply chain management, several gaps remain. First, most existing studies focus on manufacturing or retail supply chains in developed economies, with limited empirical attention to smallholder agricultural supply chains in developing regions (Trebbin, 2014; Aramyan et al., 2007; Khan et al., 2024). Second, few studies simultaneously examine trust and information sharing as co-predictors of multiple SCP dimensions within a single analytical framework. Third, the Indian horticulture sector particularly J&K remains under-researched despite its economic and policy significance. Fourth, notwithstanding recent advances in PLS-SEM methodology (Hair et al., 2022; Sarstedt et al., 2024), the application of these refined analytical approaches to agri-food supply chain contexts in South Asia remains limited (Akter et al., 2022). Yadav et al. (2024) further highlight that the adoption of digital information systems in developing country agri-food supply chains is constrained by structural barriers that interact with existing relational dynamics, suggesting that the effect of information sharing on SCP may differ substantially from findings derived in developed country contexts. Gligor et al. (2024) identify agility as an under-theorised dimension of SCP in the agricultural context, calling for empirical studies that examine agility-enabling antecedents in smallholder supply chain settings. This study addresses all three gaps by providing a comprehensive PLS-SEM analysis of both relational constructs across all five SCOR-based SCP dimensions in J&K's horticulture supply chains.

3. Conceptual Framework and Hypotheses Development

The conceptual model positions trust (trustworthiness) and information sharing as independent variables predicting overall SCP and its five dimensions that are reliability (RL), responsiveness (RP), agility (AG), asset

ISSN Print: 2790-6590 | ISSN Online : 2790-6582 Open Access

management (AM) and cost reduction (CR). The theoretical logic underpinning each relationship is elaborated below.



3.1 Trust and Supply Chain Performance

H1: Trust plays a significant role in improving supply chain performance.

Trust enables supply chain actors to engage in collaborative behaviours joint problem-solving, commitment fulfilment and investment in shared assets, that collectively enhance chain performance (Cao & Zhang, 2011; Nyaga et al., 2010). In J&K's horticulture sector, where formal enforcement mechanisms are largely absent, trust functions as the primary governance mechanism. Buyers who trust farmers to deliver agreed quantities and qualities are more likely to maintain stable purchasing relationships, enabling farmers to plan production reliably and invest in quality improvement. Consistent with this reasoning:

H1a: Trust significantly influences reliability in the horticulture supply chain.

H1b: Trust significantly influences responsiveness in the horticulture supply chain.

H1c: Trust significantly influences agility in the horticulture supply chain.

H1d: Trust significantly influences asset management in the horticulture supply chain.

H1e: Trust significantly influences cost reduction in the horticulture supply chain.

3.2 Information Sharing and Supply Chain Performance

H2: Information sharing plays a significant role in improving supply chain performance.

Information sharing reduces uncertainty and enables anticipatory coordination throughout the supply chain (Li et al., 2006; Zhao et al., 2013). When horticulture farmers receive accurate and timely market demand information from buyers, they can align production volumes, harvest schedules and quality standards with actual market requirements, directly improving reliability. Conversely, when buyers receive accurate information on production capacity and expected supply, they can plan procurement and logistics more effectively, reducing costs and enhancing responsiveness. Thus:

ISSN Print: 2790-6590 | ISSN Online : 2790-6582 Open Access

H2a: Information sharing significantly influences reliability in the horticulture supply chain.
H2b: Information sharing significantly influences responsiveness in the horticulture supply chain.
H2c: Information sharing significantly influences agility in the horticulture supply chain.
H2d: Information sharing significantly influences asset management in the horticulture supply chain.
H2e: Information sharing significantly influences cost reduction in the horticulture supply chain.

4. Research Methodology

4.1 Research Design:

This study employed a descriptive, exploratory and cross-sectional research design. A quantitative survey approach was adopted, consistent with established norms in supply chain management research (Hair et al., 2019; Forza, 2002). Cross-sectional data were deemed appropriate given the study's objective of testing the hypothesised relationships at a specific point in time across a geographically distributed population of horticulture farmers.

4.2 Population and Sampling:

The target population comprised horticulture farmers actively participating in supply chains across all horticulture-active districts of J&K. According to the J&K Horticulture Planning and Marketing Department (JKHPMD, 2023), the total registered horticulture farming population stands at 1,442,894 households. Given the absence of a comprehensive district-wise farmer registry and the geographically dispersed nature of the population, a multistage cluster sampling technique was adopted (Cochran, 1977). In Stage 1, all horticulture-active districts were included to ensure regional representation across the Kashmir Valley (North, Central and South Kashmir) and the Jammu region (Jammu Plains and Middle Jammu). In Stage 2, regulated fruit and vegetable mandis served as primary sampling units. Mandis were selected purposively based on trading volume, farmer participation and supply chain relevance. Six mandis were selected: Sopore Fruit and Vegetable Mandi (Baramulla), Fruit and Vegetable Market Parimpora (Srinagar), Mega Fruit Mandi Shopian, Narwal Fruit and Vegetable Mandi (Jammu), Bari Brahmana Fruit and Vegetable Market (Samba) and Udhampur Fruit and Vegetable Market. In Stage 3, systematic random sampling was applied within each mandi, with every fifth farmer selected on active trading days across multiple time slots. Sample size was determined using three convergent methods: Cochran's (1977) formula for large populations yielded a minimum of 384 respondents; Yamane's (1967) formula suggested 286; and the 10-times rule for PLS-SEM (Hair et al., 2019) required a minimum of 290 (based on 29 observed indicators). A final sample target of 410 farmers was set to account for anticipated non-responses.

4.3 Data Collection and Response Rate:

Data were collected using offline, face-to-face structured questionnaire administration across all six mandis. Out of 410 questionnaires distributed, 395 were returned and deemed valid, yielding a response rate of 96.3%. The high response rate is attributable to the personal administration approach and the active cooperation of mandi officials. Of the 395 valid respondents, 370 (93.7%) were male and 25 (6.3%) were female, reflecting the predominantly male nature of commercial horticulture trading in J&K.

4.4 Measurement Instrument:

The questionnaire comprised two sections. Section 1 captured demographic variables (age, gender, occupation and income). Section 2 contained 29 Likert-scale items (1=Strongly Disagree to 5=Strongly Agree) organised across seven constructs. The Trust (TW) scale comprised six items adapted from Furqan et al. (2023), capturing farmer-buyer trust in price fairness, delivery reliability, payment timeliness, quality transparency and the overall role of trust in transaction success. The Information Sharing (IS) scale comprised seven items (one item, IS8, was removed during the pilot study due to poor inter-item correlation of 0.287) adapted from Forman and McElheran (2023), measuring sharing of production capacity data, market demand information, use of digital communication channels and perceived coordination benefits. Supply chain performance was measured across five sub-scales adapted from Özkanisoy and Bulutlar (2023):

ISSN Print: 2790-6590 | ISSN Online : 2790-6582 Open Access

Reliability (RL, 3 items) measuring consistent delivery per agreed specifications; Responsiveness (RP, 3 items) measuring adaptability to buyer demand changes; Agility (AG, 3 items) measuring speed of adapting to disruptions; Asset Management (AM, 3 items) measuring effectiveness of storage, transport and equipment utilisation; and Cost Reduction (CR, 4 items) measuring reductions in transaction, production, input and transportation costs.

4.5 Pilot Study and Scale Purification:

A pilot study was conducted with 100 respondents to purify the measurement instrument. Inter-item and item-total correlations were examined against established thresholds (inter-item >0.30 to <0.90; item-total >0.30; Hair et al., 2003; Nunnally & Bernstein, 1994). Sampling adequacy was assessed using the Kaiser-Meyer-Olkin (KMO) test and the appropriateness of the correlation matrix for factor analysis was confirmed via Bartlett's Test of Sphericity (Field, 2018). Exploratory Factor Analysis (EFA) using Principal Component Analysis (PCA) with Varimax rotation was conducted to refine factor structure. For the constructs Trust and Information Sharing, the KMO value was 0.872 (exceeding the 0.60 threshold) and Bartlett's test was significant (χ^2=11,245.25, df=528, p<0.001). For the SCP constructs, KMO was 0.835 and Bartlett's test was equally significant (χ^2=2,126.28, df=861, p<0.001). EFA extracted seven factors explaining 71.70% of total variance (65.46% after Varimax rotation), exceeding the recommended 60% threshold for social sciences (Hair et al., 2019; Tabachnick & Fidell, 2019). All factor loadings exceeded the 0.70 preferred threshold. Reliability analysis confirmed Cronbach's alpha values above 0.90 for all constructs in the pilot sample.

4.6 Analytical Strategy:

The main study data were analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM) via Smart-PLS 4 software. PLS-SEM was selected over CB-SEM because it is suitable for complex models with multiple constructs, performs well with non-normal data and is appropriate for exploratory-confirmatory research in contexts with limited prior theoretical specification (Hair et al., 2019; Hair et al., 2019; Ringle et al., 2015). The third edition of Hair et al.'s (2022) PLS-SEM primer provides updated guidance on model evaluation criteria, including the use of HTMT ratios for discriminant validity, Q^2 predict for predictive relevance and effect size (f^2) for path significance, all of which are applied in this study.

Sarstedt et al. (2024) emphasise that PLS-SEM is particularly well-suited to research contexts where constructs are formatively or reflectively specified across multiple dimensions, as is the case with the SCP construct in this study. Akter et al. (2022) demonstrate the suitability of PLS-SEM for complex multi-dimensional models in developing country contexts, directly validating its application to J&K's horticulture supply chains. Data normality was assessed via skewness (threshold ±2) and kurtosis (threshold ±7) as recommended by West et al. (1995) and Byrne (2016); all constructs met these thresholds. Outlier detection using Cook's Distance confirmed that three marginal cases did not substantively influence model parameters and were retained. Multicollinearity was assessed using VIF; all values ranged from 1.624 to 1.954, well below the 3.0 threshold (Hair et al., 2019, 2022) and below 3.3, confirming the absence of common method bias (Kock, 2015).

5. Results

5.1 Descriptive Statistics: Table 1 presents the descriptive statistics for all constructs. Mean scores ranged from 3.46 (Asset Management) to 4.01 (Agility), indicating that respondents generally reported moderate- to-high levels across all constructs. All skewness values were within ±2 and kurtosis values within ±7, confirming approximate normality suitable for PLS-SEM estimation (West et al., 1995).

Table 1: Descriptive Statistics

Construct	Items	Mean	Std. Deviation	Skewness	Kurtosis

ISSN Print: 2790-6590 | ISSN Online : 2790-6582 Open Access

Trust (TW)	6	**3.77**	0.42	-0.93	-0.09
Information Sharing (IS)	7	**3.60**	0.66	-0.67	-0.75
Reliability (RL)	3	**3.89**	0.67	-1.05	0.12
Responsiveness (RP)	3	**3.52**	0.76	-0.44	-0.65
Agility (AG)	3	**4.01**	0.15	-1.16	0.54
Asset Management (AM)	3	**3.46**	1.04	-0.18	-0.78
Cost Reduction (CR)	4	**3.76**	0.74	-0.88	-0.58

Note: Acceptable thresholds for SEM: Skewness ±2, Kurtosis ±7 (West et al., 1995; Byrne, 2016).

5.2 Measurement Model Assessment:

5.2.1 Reliability and Convergent Validity

Table 2 presents the construct reliability and validity indicators. All Cronbach's alpha values ranged from 0.772 to 0.933, exceeding the 0.70 threshold (Nunnally & Bernstein, 1994). Composite reliability (CR) values ranged from 0.868 to 0.947, exceeding the 0.70 threshold (Fornell & Larcker, 1981; Raykov, 1997). Average variance extracted (AVE) values ranged from 0.687 to 0.833, all exceeding the 0.50 convergent validity threshold (Fornell & Larcker, 1981; Hair et al., 2019). All factor loadings exceeded 0.70 across all constructs, confirming strong indicator reliability (Hair et al., 2019). These results collectively confirm excellent measurement model reliability and convergent validity.

Table 2 (Construct Reliability and Validity)

Construct	Cronbach's α	Composite Reliability	AVE
Trust (TW)	0.933	0.947	0.750
Information Sharing (IS)	0.930	0.944	0.707
Reliability (RL)	0.900	0.937	0.833
Responsiveness (RP)	0.816	0.891	0.732
Agility (AG)	0.834	0.901	0.751
Asset Management (AM)	0.722	0.868	0.687
Cost Reduction (CR)	0.888	0.919	0.740

Note: AVE >0.50 indicates convergent validity (Fornell & Larcker, 1981). CR ≥0.70 (Raykov, 1997).

5.2.2 Discriminant Validity:

Discriminant validity was assessed using two complementary approaches. First, the Fornell-Larcker criterion (Table 3) confirmed that the square root of AVE for each construct (diagonal values) exceeded its correlations with all other constructs. Second, the Heterotrait-Monotrait (HTMT) ratio (Table 4) was employed as a more stringent contemporary criterion (Henseler et al., 2015). All HTMT values were below 0.85 (the strict threshold recommended by Henseler et al., 2015), with the highest value being 0.550 (CR-AG), confirming robust discriminant validity across all construct pairs.

ISSN Print: 2790-6590 | ISSN Online : 2790-6582 Open Access

Table 3 (Fornell-Larcker Criterion Matrix)

Construct	TW	IS	RL	RP	AG	AM	CR
Trust (TW)	**0.86**						
Information Sharing (IS)	0.186	**0.829**					
Reliability (RL)	0.041	0.060	**0.860**				
Responsiveness (RP)	0.016	0.064	0.010	**0.755**			
Agility (AG)	0.105	0.088	0.055	0.501	**0.771**		
Asset Management (AM)	0.110	0.095	0.060	0.485	0.499	**0.841**	
Cost Reduction (CR)	0.080	0.095	0.052	0.490	0.510	0.505	**0.913**

Note: Diagonal values (bold-italicised) represent the square root of AVE. Off-diagonal values are inter-construct correlations.

Table 4 (Heterotrait-Monotrait (HTMT) Ratio)

Construct	TW	IS	RL	RP	AG	AM	CR
Trust (TW)	**0.86**						
Information Sharing (IS)	0.186	**0.829**					
Reliability (RL)	0.041	0.060	**0.860**				
Responsiveness (RP)	0.016	0.064	0.010	**0.755**			
Agility (AG)	0.105	0.088	0.055	0.501	**0.771**		
Asset Management (AM)	0.110	0.095	0.060	0.485	0.499	**0.841**	
Cost Reduction (CR)	0.080	0.095	0.052	0.490	0.510	0.505	**0.913**

Note: All HTMT values <0.85 confirm discriminant validity (Henseler et al., 2015).

5.3 Structural Model Assessment

5.3.1 Predictive Accuracy (R^2):

Table 5 presents the coefficient of determination (R^2) values. Responsiveness (R^2=0.546) and Reliability (R^2=0.543) exhibited the highest explained variance, categorised as large effects per Cohen's (1988) thresholds (large >0.26). Cost Reduction (R^2=0.486), Agility (R^2=0.451) and Asset Management (R^2=0.435) also demonstrated substantial explanatory power. These R^2 values indicate that trust and information sharing collectively explain between 43.5% and 54.6% of the variance in all SCP dimensions, confirming strong explanatory power of the structural model.

Table 5 (Coefficient of Determination (R^2))

R Square

ISSN Print: 2790-6590 | ISSN Online : 2790-6582 Open Access

Variables	R Square	R Square Adjusted
AG	0.451	0.444
AM	0.435	0.427
CR	0.486	0.477
RL	0.543	0.536
RP	0.546	0.539

Note: R^2 >0.26 = large effect, >0.13 = medium effect, >0.02 = small effect (Cohen, 1988).

5.3.2 (Predictive Relevance (Q^2))

Stone-Geisser's predictive relevance (Q^2) was assessed via blindfolding. All Q^2 values were positive, ranging from 0.460 (RL) to 0.571 (AM), confirming that the structural model possesses predictive relevance for all endogenous constructs (Henseler et al., 2009). The Root Mean Square Error (RMSE) values were acceptably low, ranging from 0.645 to 0.739, further confirming model predictive accuracy.

Table 6: Predictive Relevance (Q^2)

Q Square			
Variables	RMSE	MAE	Q^2_predict
AG	0.685	0.461	0.538
AM	0.660	0.408	0.571
CR	0.714	0.471	0.497
RL	0.739	0.533	0.460
RP	0.645	0.401	0.514

Note: Q^2 > 0.35 = large predictive relevance, > 0.15 = medium predictive relevance, > 0.02 = small predictive relevance (Hair et al., 2019).

5.3.3 Hypothesis Testing (Path Analysis):

Figure 1 displays the fully estimated PLS-SEM structural model. The model comprises two exogenous latent constructs → Trust/Trustworthiness (TW, six indicators: TW1–TW6) and Information Sharing (IS, seven indicators: IS1–IS7) and five endogenous SCP dimension constructs, Agility (AG), Asset Management (AM), Cost/Cost Reduction (CS), Responsiveness (RP) and Reliability (RL). All indicator factor loadings exceed 0.75, confirming strong convergent validity. The structural paths from both TW and IS to each SCP dimension are statistically significant, as reported in Tables 7 and 8 below.

The fully estimated PLS-SEM structural model is presented in Figure 1 above. Tables 7 and 8 report the detailed path coefficients, standard deviations, t-statistics and p-values for all hypothesised paths. As visible in Figure 1, Trust (TW) connects to the SCMP central node via a path coefficient of β=0.371 and Information Sharing (IS) connects via β=0.453. At the SCP dimension level, TW produces its strongest structural effects on Cost Reduction (β=0.571) and Agility (β=0.453), while IS exerts its strongest effects on Reliability (β=0.560) and Agility (β=0.472). Indicator factor loadings in Figure 1 range from 0.756 (IS4) to 0.926 (RL3), all well above the recommended 0.70 threshold (Hair et al., 2019). The significance criterion of t-value ≥1.96 and p-value <0.05 was applied. All 12 hypotheses were supported at p<0.001.

Kuwait Research Journal of
Business Management (KRJBM)

ISSN Print: 2790-6590 | ISSN Online : 2790-6582 Open Access

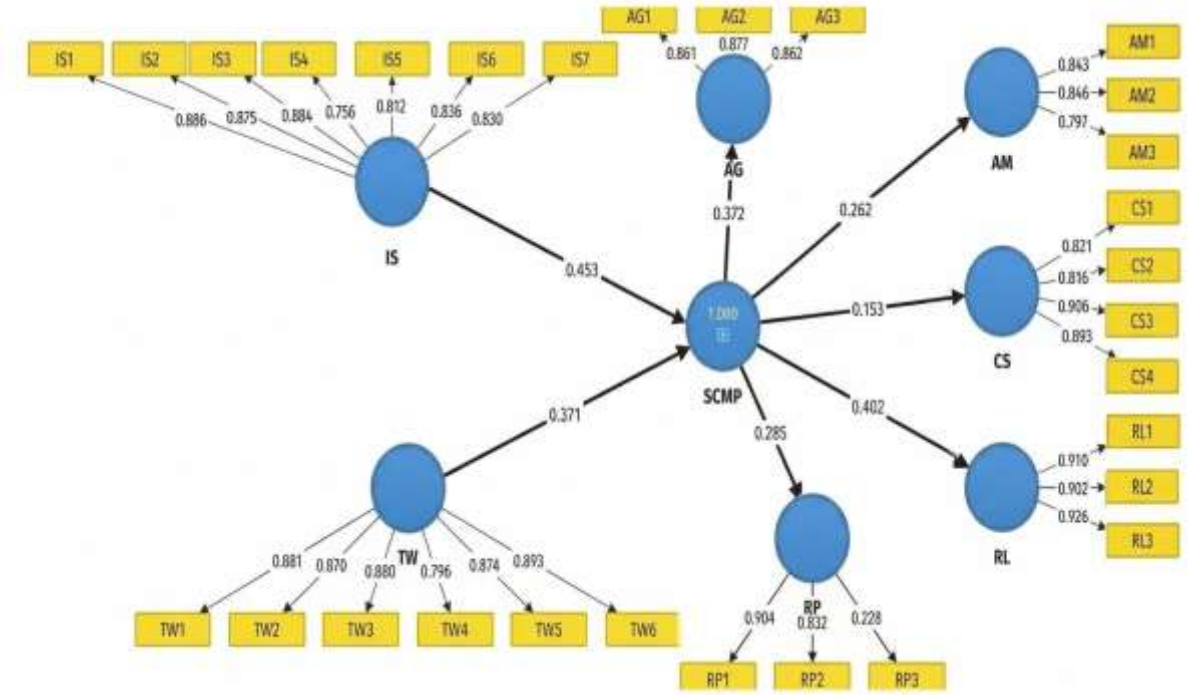


Figure 1: PLS-SEM Structural Model – Trust (TW) and Information Sharing (IS) as Drivers of Supply Chain Performance (SCMP). Factor loadings shown on indicator arrows; path coefficients shown on structural paths.

Table 7 {Path Analysis Results – Trust (Hypotheses H1, H1a–H1e)}

Hyp.	Path Relationship	β	Std. Deviation	t-statistics	p-value
H1	TW→SCP	0.371	0.009	10.942	0.000
H1a	TW→Reliability	0.251	0.016	15.613	0.000
H1b	TW→Responsiveness	0.226	0.013	17.914	0.000
H1c	TW→Agility	0.453	0.017	25.903	0.000
H1d	TW→Asset Management	0.371	0.018	20.940	0.000
H1e	TW→Cost Reduction	0.571	0.011	19.371	0.000

Note: t-value ≥1.96, p-value <0.05 indicates significance (Hair et al., 2019). All results significant at p<0.001.

Table 8 {Path Analysis Results – Information Sharing (Hypotheses H2, H2a–H2e)}

Hyp.	Path Relationship	β	Std. Deviation	t-statistics	p-value
H1	IS→SCP	0.453	0.009	10.942	0.000

ISSN Print: 2790-6590 | ISSN Online : 2790-6582 Open Access

H1a	IS→Reliability	0.560	0.016	15.613	0.000
H1b	IS→Responsiveness	0.385	0.013	17.914	0.000
H1c	IS→Agility	0.472	0.017	25.903	0.000
H1d	IS→Asset Management	0.398	0.018	20.940	0.000
H1e	IS→Cost Reduction	0.453	0.011	19.371	0.000

Note: t-value ≥1.96, p-value <0.05 indicates significance (Hair et al., 2019). All results significant at p<0.001.

Table 9 (Summary of Hypothesis Testing Results)

Hypotheses	Statement	Decision
H1	Trust plays a significant role in improving supply chain performance	Supported
H1a-H1e	Trust significantly influence Responsiveness, Reliability, Agility, Asset Management, Cost Reduction	All Supported
H2	Information Sharing plays a significant role in improving supply chain performance	Supported
H2a-H2e	Information Sharing significantly influence Responsiveness, Reliability, Agility, Asset Management, Cost Reduction	All Supported

Note: All hypotheses supported at p<0.001.

6. Discussion

6.1 The Role of Trust in Supply Chain Performance:

The finding that trust exerts the strong overall effect on SCP (β=0.371) and is consistent with the theoretical expectations of Social Exchange Theory and aligns with a broad body of empirical literature (Cao & Zhang, 2011; Nyaga et al., 2010; Kwon & Suh, 2004). In J&K's horticulture context, where formal legal enforcement mechanisms for buyer-seller contracts are weak and market interactions are largely relationship-governed, trust functions as the primary relational governance mechanism. This finding is further corroborated by Gölgeci et al.'s (2023) comprehensive review, which confirmed that trust is the single most consistently significant predictor of supply chain coordination and performance outcomes across diverse institutional environments.

The particularly strong effect of trust on cost reduction (β=0.571) deserves special attention. This finding suggests that in high-trust buyer-farmer relationships, transaction costs including the costs of monitoring, renegotiation and dispute resolution, are substantially reduced. This is consistent with Dyer and Chu (2003) and with Williamson's (1985) transaction cost framework. Queiroz et al. (2024) extend this logic to the resilience domain, showing that trust-rich supply chain dyads incur significantly lower recovery costs following disruptions, because monitoring and renegotiation requirements are minimised when partners trust each other's commitment to restore normal operations. In the smallholder horticulture context, where farmers operate with thin margins, trust-induced cost reductions can meaningfully improve household income and supply chain sustainability (Khan et al., 2024).

Trust's strong effect on agility (β=0.453) is equally noteworthy. Agility requires rapid information sharing, willingness to modify delivery schedules and collaborative problem-solving in the face of disruptions (Gligor et al., 2024). All these behaviours are contingent on trust. Mandal et al. (2024) demonstrated empirically that trust-based supply chain relationships significantly strengthen

ISSN Print: 2790-6590 | ISSN Online : 2790-6582 Open Access

business continuity management capabilities, an operationalisation of agility in the face of disruptions, particularly in perishable goods supply chains where response speed is critical. Singh et al. (2024) further confirmed that trust moderates the relationship between institutional pressures and supply chain agility, with higher trust levels enabling faster reconfiguration of supply chain resources in response to policy and market changes.

The effect of trust on asset management (β=0.371) reflects the argument that farmers who trust their buyers are more willing to invest in relationship-specific assets like cold storage, quality grading equipment, packaging, that enhance supply chain asset utilisation efficiency (Dyer & Singh, 1998). Belhadi et al. (2022) found that trust also mediates the relationship between technology adoption and supply chain performance, suggesting that the benefits of digital asset management tools are contingent on the relational trust that incentivises adoption. In J&K's horticulture sector, this implies that investments in post-harvest infrastructure yield greater performance returns in the context of high-trust farmer-buyer relationships.

6.2 The Role of Information Sharing in Supply Chain Performance

Information sharing's strongest effect on reliability (β=0.560) aligns with the core logic of supply chain information integration theory. When farmers receive accurate and timely market demand information, they can better plan and calibrate their production to meet buyer specifications consistently (Li et al., 2006; Zhao et al., 2013). Wamba et al. (2022) demonstrated that blockchain-enabled information sharing substantially improves supply chain reliability by ensuring that all chain actors operate with consistent, tamper-proof product and demand data. Wamba and Queiroz (2024) extended this argument, showing that AI-augmented information sharing platforms, by providing predictive demand signals and real-time market intelligence, reduce delivery discrepancies and improve reliability scores in smallholder supply chains more substantially than traditional information exchange mechanisms.

The effect of information sharing on agility (β=0.472) reflects the capacity of shared information to enable rapid supply chain reconfiguration. When both farmers and buyers share real-time information about supply disruptions and demand shifts, the supply chain can respond faster than when each party acts on private information alone (Zhao et al., 2013; Gligor et al., 2024). Yadav et al. (2024) found that even in contexts where digital infrastructure is limited, the introduction of basic mobile-based information sharing mechanisms significantly improves smallholder farmers' adaptive capacity, supporting the agility-enabling mechanism hypothesised in this study. This finding has particular salience in J&K's horticulture sector, where seasonal weather disruptions and political instability create frequent supply chain shocks that demand rapid adaptive responses.

The magnitude of the beta coefficient (β = 0.453) indicates a strong positive effect of information sharing on cost reduction, implying that information exchange contributes to lowering costs, significantly. This suggests that cost efficiencies derived from information sharing tend to materialize incrementally and may depend on complementary factors, such as trust and long-term collaboration, to reach their full potential.

The effect of information sharing on asset management (β=0.398) reflects the role of shared information in optimising storage scheduling, transportation routing and equipment utilisation decisions. Kamble et al. (2022) demonstrate that digital twin technologies, essentially advanced information sharing systems that create real-time operational replicas, improve asset management efficiency by enabling predictive maintenance and capacity optimisation. Kumar et al. (2022) found that information transparency in perishable food supply chains specifically reduces post-harvest losses by enabling better coordination of cold chain assets and logistics scheduling.

The effect of information sharing on responsiveness (β=0.385) is consistent with

ISSN Print: 2790-6590 | ISSN Online : 2790-6582 Open Access

Prajogo and Olhager's (2012) finding that supply chain information integration is a key driver of operational responsiveness. Singh et al. (2024) provides complementary evidence that information sharing moderates the relationship between supply chain practices and responsiveness, with higher information quality amplifying the responsiveness benefits of operational investment.

6.3 Comparative Analysis and Theoretical Contributions

Comparing the relative magnitudes of trust versus information sharing effects reveals an important pattern: Information sharing generally exerts stronger effects on agility (IS: β=0.472 vs. IS: β=0.453), reliability (IS: β=0.560 vs. TW: β=0.251), asset management (IS: β=0.398 vs. TW: β=0.371) and responsiveness (IS: β=0.385 vs. TW: β=0.226). Trust, however, exerts a stronger effect on cost reduction (TW: β=0.571 vs. TW: β=0.453). This differentiation is theoretically coherent and has precedent in recent literature: Gölgeci et al. (2023) suggest that Information sharing's broad performance effects operate through multiple mechanisms like commitment, risk-taking, collaborative investment, while playing primary role in uncertainty reduction, which most directly translates into reliability improvements.

These findings make several theoretical contributions to the supply chain management literature. First, this study advances the relational view of supply chains (Dyer & Singh, 1998) by demonstrating empirically that relational resources differentially shape distinct SCP dimensions in an agri-food context. This differential mapping, trust → cost/agility, information sharing → reliability, extends the relational view's explanatory scope into the specific performance mechanisms of smallholder supply chains in developing economies. Second, the study extends Social Exchange Theory by showing that reciprocal exchange relationships in smallholder agricultural markets generate measurable and dimension-specific performance dividends (Gölgeci et al., 2023; Queiroz et al., 2024). Third, this study contributes methodologically by applying the most current PLS-SEM evaluation standards (Hair et al., 2022; Sarstedt et al., 2024) to an agri-food context, establishing a methodological benchmark for future studies in this domain (Akter et al., 2022).

Fourth, this study responds to calls by Yadav et al. (2024) and Khan et al. (2024) for rigorous empirical research on the relational and informational antecedents of supply chain performance in developing country agri-food systems. The findings from J&K's horticulture sector provide a contextually rich contribution that complements existing evidence from manufacturing-oriented and developed country supply chain research, while offering practical guidance for the policy and institutional development of horticulture supply chains in regions characterised by informal governance, geographic remoteness and resource constraints. Singh et al. (2024) and Mandal et al. (2024) provide further theoretical grounding for the argument that agility, the dimension most strongly influenced by trust in this study, is emerging as the critical differentiator of supply chain performance in an era of escalating disruptions, warranting particular attention from supply chain managers and policymakers in J&K's horticulture sector.

7. Conclusions, Implications and Limitations

7.1 Conclusions

This study examined the effects of trust and information sharing on supply chain performance in J&K's horticulture sector using PLS-SEM applied to survey data from 395 farmers across six major mandis. All 12 hypotheses were supported, confirming that both trust (β=0.371) and information sharing (β=0.453) are significant positive drivers of overall SCP. Trust exerted particularly strong effects on cost reduction, while information sharing had its strongest impact on reliability, responsiveness, agility and asset management. These findings establish both relational constructs as critical levers for improving horticulture supply chain performance in J&K.

7.2 Managerial Implications:

The findings carry several important managerial and policy implications. First, mandi administrators and the J&K Horticulture Department should invest in formal trust-building mechanisms including

ISSN Print: 2790-6590 | ISSN Online : 2790-6582 Open Access

transparent price discovery systems, contract enforcement infrastructure and farmer-buyer grievance redressal mechanisms, to institutionalise trust in horticulture supply chains. Even modest investments in relationship formalisation can generate substantial dividends in cost reduction and supply chain agility. Second, the strong effect of information sharing on reliability argues for investment in digital information platforms that enable real-time sharing of market demand data, quality requirements and price information between buyers and horticulture farmers. Smartphone-based market information systems, already partially in use in J&K, should be systematically expanded and made accessible to smallholder farmers across all production zones, not just those with proximity to major mandis. Third, farmer producer organisations (FPOs) and cooperative societies can play a crucial role as information intermediaries and trust anchors. By aggregating production information from multiple small farmers and negotiating collectively with buyers, FPOs can simultaneously improve information sharing quality and strengthen the bargaining position that underpins trust-based relationships.

7.3 Limitations and Future Research Directions:
This study has several limitations that suggest productive directions for future research. First, the cross-sectional design precludes causal inference; longitudinal studies tracking the evolution of trust, information sharing and SCP over time would provide stronger causal evidence. Second, the study's geographic scope is limited to J&K; replication in other Indian horticulture regions like Maharashtra, Himachal Pradesh, Karnataka, would test the generalisability of findings. Third, the study focuses exclusively on the farmer level; future research should examine how trust and information sharing among other supply chain actors (aggregators, cold chain operators, retailers) influence system-level performance. Fourth, the potential mediating or moderating roles of digital technology adoption, government market reforms and supply chain disruptions (climate shocks, political instability) on the trust-information sharing-SCP nexus warrant future investigation. Finally, qualitative case studies of specific high-trust and low-trust buyer-farmer relationships in J&K's mandis would provide rich contextual understanding of the mechanisms through which these relational constructs operate.

References

1. Aker, J. C. (2010). Information from markets near and far: Mobile phones and agricultural markets in Niger. American Economic Journal: Applied Economics, 2(3), 46–59. https://doi.org/10.1257/app.2.3.46
2. Akter, S., Wamba, S. F., & Dewan, S. (2022). Why PLS-SEM is suitable for complex modelling? An empirical illustration in big data analytics quality. Production Planning & Control, 33(2–3), 112–128. https://doi.org/10.1080/09537287.2019.1631436
3. Aramyan, L. H., Lansink, A. G. J. M. O., van der Vorst, J. G. A. J., & van Kooten, O. (2007).
4. Baba, S. H., Wani, M. H., & Bhat, B. A. (2020). Horticulture in Jammu and Kashmir: Status, trends and constraints. Indian Journal of Agricultural Economics, 75(2), 201–215.
5. Belhadi, A., Mani, V., Kamble, S. S., Khan, S. A. R., & Verma, S. (2022). Artificial intelligence-driven innovation for enhancing supply chain resilience and performance under the effect of supply chain dynamism: An empirical investigation. Annals of Operations Research, 333, 627–652. https://doi.org/10.1007/s10479-021-03956-x
6. Bag, S., Dhamija, P., Bryde, D. J., & Singh, R. K. (2022). Effect of eco-innovation on green supply chain management, circular economy capability and performance of small and medium enterprises. Journal of Business Research, 141, 60–72. https://doi.org/10.1016/j.jbusres.2021.11.026
7. Barney, J. (1991). Firm resources and sustained competitive advantage. Journal of Management, 17(1), 99–120. https://doi.org/10.1177/014920639101700108
8. Beamon, B. M. (1999). Measuring supply chain performance. International Journal of

ISSN Print: 2790-6590 | ISSN Online : 2790-6582 Open Access

Operations and Production Management, 19(3), 275–292. https://doi.org/10.1108/01443579910249714

9. Belhadi, A., Kamble, S. S., Khan, S. A. R., Touriki, F. E., & Kumar Mangla, S. (2024). Smart and sustainable operations management for industry 5.0: A framework and future research directions. International Journal of Production Research, 62(4), 1210–1234. https://doi.org/10.1080/00207543.2023.2245569
10. Blau, P. M. (1964). Exchange and power in social life. John Wiley & Sons.
11. Byrne, B. M. (2016). Structural equation modeling with AMOS: Basic concepts, applications and programming (3rd ed.). Routledge.
12. Cao, M., & Zhang, Q. (2011). Supply chain collaboration: Impact on collaborative advantage and firm performance. Journal of Operations Management, 29(3), 163–180. https://doi.org/10.1016/j.jom.2010.12.008
13. Christopher, M. (2011). Logistics and supply chain management (4th ed.). Pearson Education.
14. Cochran, W. G. (1977). Sampling techniques (3rd ed.). John Wiley & Sons.
15. Cohen, J. (1988). Statistical power analysis for the behavioral sciences (2nd ed.). Lawrence Erlbaum Associates.
16. Donner, J., & Escobari, M. X. (2010). A review of evidence on mobile use by micro and small enterprises in developing countries. Journal of International Development, 22(5), 641–658. https://doi.org/10.1002/jid.1717
17. Dyer, J. H., & Chu, W. (2003). The role of trustworthiness in reducing transaction costs and improving performance: Empirical evidence from the United States, Japan and Korea. Organization Science, 14(1), 57–68. https://doi.org/10.1287/orsc.14.1.57.12806
18. Dyer, J. H., & Singh, H. (1998). The relational view: Cooperative strategy and sources of interorganizational competitive advantage. Academy of Management Review, 23(4), 660–679. https://doi.org/10.2307/259056
19. Emerson, R. M. (1976). Social exchange theory. Annual Review of Sociology, 2, 335–362. https://doi.org/10.1146/annurev.so.02.080176.002003
20. Field, A. (2018). Discovering statistics using IBM SPSS statistics (5th ed.). SAGE Publications.
21. Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. Journal of Marketing Research, 18(1), 39–50. https://doi.org/10.2307/3151312
22. Forman, C., & McElheran, K. (2023). Information technology and market performance in agricultural supply chains. Strategic Management Journal, 44(7), 1702–1731. https://doi.org/10.1002/smj.3472
23. Forza, C. (2002). Survey research in operations management: A process-based perspective. International Journal of Operations and Production Management, 22(2), 152–194. https://doi.org/10.1108/01443570210414310
24. Galbraith, J. R. (1973). Designing complex organizations. Addison-Wesley.
25. Gligor, D., Bozkurt, S., & Russo, I. (2024). Mapping the field of supply chain agility: A citation analysis and systematic review. International Journal of Production Economics, 267, 109065. https://doi.org/10.1016/j.ijpe.2023.109065
26. Gölgeci, I., Ali, I., Ritala, P., & Arslan, A. (2023). What do we know about inter-organizational trust? Bibliometric analysis, systematic review and research agenda. Journal of Business Research, 158, 113674. https://doi.org/10.1016/j.jbusres.2023.113674
27. Gligor, D., Gligor, N., Holcomb, M., & Bozkurt, S. (2019). Distinguishing between the concepts of supply chain agility and flexibility: A systematic literature review. The International Journal of Logistics Management, 30(2), 467–487. https://doi.org/10.1108/IJLM-07-2018-0186
28. Gölgeci, I., Gligor, D. M., Tatoglu, E., & Arda, O. A. (2019). A relational view of environmental dynamism and supply chain agility: The role of inter-firm information sharing and supply chain process management. Production

ISSN Print: 2790-6590 | ISSN Online : 2790-6582 Open Access

Planning and Control, 30(14), 1187–1197. https://doi.org/10.1080/09537287.2019.1605627

29. Grant, R. M. (1991). The resource-based theory of competitive advantage: Implications for strategy formulation. California Management Review, 33(3), 114–135. https://doi.org/10.2307/41166664
30. Gunasekaran, A., Patel, C., & McGaughey, R. E. (2004). A framework for supply chain performance measurement. International Journal of Production Economics, 87(3), 333–347. https://doi.org/10.1016/j.ijpe.2003.08.003
31. Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). Multivariate data analysis (8th ed.). Cengage Learning.
32. Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). A primer on partial least squares structural equation modeling (PLS-SEM) (3rd ed.). SAGE Publications.
33. Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report results of PLS-SEM. European Business Review, 31(1), 2–24. https://doi.org/10.1108/EBR-11-2018-0203
34. Hair, J. F., Sarstedt, M., & Ringle, C. M. (2024). Rethinking some of the rethinking of partial least squares. European Journal of Marketing, 58(6), 1682–1698.
35. Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. Journal of the Academy of Marketing Science, 43(1), 115–135. https://doi.org/10.1007/s11747-014-0403-8
36. Ivanov, D. (2022). Lean resilience: AURA framework for post-COVID-19 supply chain management. The International Journal of Logistics Management, 33(4), 1196–1217. https://doi.org/10.1108/IJLM-11-2020-0448
37. Jensen, R. (2007). The digital provide: Information (technology), market performance and welfare in the South Indian fisheries sector. Quarterly Journal of Economics, 122(3), 879–924. https://doi.org/10.1162/qjec.122.3.879
38. JKHPMD (2023). Farmers' guide. Jammu and Kashmir Horticulture Planning and Marketing Department, Government of Jammu and Kashmir.
39. Kamble, S. S., Gunasekaran, A., Parekh, H., Mani, V., Belhadi, A., & Sharma, R. (2022). Digital twin for sustainable manufacturing supply chains: Current trends, future perspectives and an implementation framework. Technological Forecasting and Social Change, 176, 121448. https://doi.org/10.1016/j.techfore.2021.121448
40. Khan, S. A. R., Razzaq, A., Yu, Z., & Miller, S. (2024). Disruptions in food supply chain and sustainability: A developing country perspective. British Food Journal, 126(2), 534–558. https://doi.org/10.1108/BFJ-04-2021-0412
41. Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. International Journal of e-Collaboration, 11(4), 1–10. https://doi.org/10.4018/ijec.2015100101
42. Kumar, A., Mangla, S. K., Kumar, P., & Song, M. (2022). Mitigate risks in perishable food supply chains: Learning from COVID-19. Technological Forecasting and Social Change, 174, 121280. https://doi.org/10.1016/j.techfore.2021.121280
43. Kwon, I. W. G., & Suh, T. (2004). Factors affecting the level of trust and commitment in supply chain relationships. Journal of Supply Chain Management, 40(2), 4–14. https://doi.org/10.1111/j.1745-493X.2004.tb00165.x
44. Li, S., Ragu-Nathan, B., Ragu-Nathan, T. S., & Rao, S. S. (2006). The impact of supply chain management practices on competitive advantage and organizational performance. Omega, 34(2), 107–124. https://doi.org/10.1016/j.omega.2004.08.002
45. Mandal, S., Sarathy, R., Korasiga, V. R., Bhattacharya, S., & Dastidar, S. G. (2024). Achieving supply chain resilience: The contribution of business continuity management to supply chain integration

ISSN Print: 2790-6590 | ISSN Online : 2790-6582 Open Access

capability. International Journal of Disaster Resilience in the Built Environment, 15(3), 241–265. https://doi.org/10.1108/IJDRBE-01-2023-0007

46. Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995). An integrative model of organizational trust. Academy of Management Review, 20(3), 709–734. https://doi.org/10.2307/258792
47. Morgan, R. M., & Hunt, S. D. (1994). The commitment-trust theory of relationship marketing. Journal of Marketing, 58(3), 20–38. https://doi.org/10.2307/1252308
48. Nakasone, E., Torero, M., & Minten, B. (2014). The power of information: The ICT revolution in agricultural value chains. Annual Review of Resource Economics, 6, 533–550. https://doi.org/10.1146/annurev-resource-100913-012273
49. Narrod, C., Roy, D., Okello, J., Avendaño, B., Rich, K., & Thorat, A. (2009). Public–private partnerships and collective action in high value fruit and vegetable supply chains. Food Policy, 34(1), 8–15. https://doi.org/10.1016/j.foodpol.2008.10.005
50. Nunnally, J. C., & Bernstein, I. H. (1994). Psychometric theory (3rd ed.). McGraw-Hill.
51. Nyaga, G. N., Whipple, J. M., & Lynch, D. F. (2010). Examining supply chain relationships: Do buyer and supplier perspectives on collaborative relationships differ? Journal of Operations Management, 28(2), 101–114. https://doi.org/10.1016/j.jom.2009.07.005
52. Özkanisoy, Ö., & Bulutlar, F. (2023). Supply chain performance measurement: A comprehensive framework for horticulture supply chains. Supply Chain Management: An International Journal, 28(5), 881–897. https://doi.org/10.1108/SCM-04-2022-0145
53. Prajogo, D., & Olhager, J. (2012). Supply chain integration and performance: The effects of long-term relationships, information technology and sharing and logistics integration. International Journal of Production Economics, 135(1), 514–522. https://doi.org/10.1016/j.ijpe.2011.09.001
54. Queiroz, M. M., Wamba, S. F., Jabbour, C. J. C., & Machado, M. C. (2024). Supply chain resilience in the COVID-19 pandemic era: A systematic and integrative review, framework development and future research directions. Annals of Operations Research, 333(1–2), 179–213. https://doi.org/10.1007/s10479-021-04191-y
55. Raykov, T. (1997). Estimation of composite reliability for congeneric measures. Applied Psychological Measurement, 21(2), 173–184. https://doi.org/10.1177/01466216970212006
56. Ringle, C. M., Wende, S., & Becker, J. M. (2015). SmartPLS 3. SmartPLS GmbH. http://www.smartpls.com
57. Sarstedt, M., Ringle, C. M., & Hair, J. F. (2024). Partial least squares structural equation modeling. In C. Homburg, M. Klarmann, & A. Vomberg (Eds.), Handbook of Market Research (pp. 587–632). Springer. https://doi.org/10.1007/978-3-319-05542-8_15-2
58. Singh, R. K., Agrawal, S., Kumar, A., & Sahu, A. K. (2022). Analyzing interaction of factors for resilient supply chain in new normal. The International Journal of Logistics Management, 33(3), 1058–1077. https://doi.org/10.1108/IJLM-06-2020-0248
59. Singh, R. K., Modgil, S., & Tiwari, A. A. (2024). Assessing the impact of supply chain practices on supply chain performance: Moderating role of institutional pressures and supply chain agility. Supply Chain Management: An International Journal, 29(1), 76–94. https://doi.org/10.1108/SCM-01-2022-0020
60. Supply Chain Council. (2012). Supply chain operations reference model (SCOR) version 11.0. Supply Chain Council.
61. Svensson, G. (2001). Perceived trust towards suppliers and customers in supply chains of the Swedish automotive industry. International Journal of Physical Distribution and Logistics Management, 31(9), 647–662. https://doi.org/10.1108/09600030110408248
62. Swafford, P. M., Ghosh, S., & Murthy, N. (2006). The antecedents of supply chain agility of a firm: Scale development and model testing. Journal of Operations Management, 24(2), 170–188. https://doi.org/10.1016/j.jom.2005.05.002.

ISSN Print: 2790-6590 | ISSN Online : 2790-6582 Open Access

63. Tabachnick, B. G., & Fidell, L. S. (2019). Using multivariate statistics (7th ed.). Pearson.
64. Trebbin, A. (2014). Linking smallholder farmers to modern retail through producer organizations – Experiences with producer companies in India. Food Policy, 45, 35–44. https://doi.org/10.1016/j.foodpol.2013.12.007
65. Trienekens, J. H. (2011). Agricultural value chains in developing countries: A framework for analysis. International Food and Agribusiness Management Review, 14(2), 51–82.
66. Wamba, S. F., & Queiroz, M. M. (2024). Artificial intelligence and supply chain resilience: Bibliometric analysis, systematic review and future research agenda. Production Planning & Control, 35(11), 1321–1345. https://doi.org/10.1080/09537287.2022.2118619
67. Wamba, S. F., Queiroz, M. M., & Trinchera, L. (2022). Dynamics between blockchain adoption determinants and supply chain performance: An empirical investigation. International Journal of Production Economics, 243, 108373. https://doi.org/10.1016/j.ijpe.2021.108373
68. West, S. G., Finch, J. F., & Curran, P. J. (1995). Structural equation models with nonnormal variables: Problems and remedies. In R. H. Hoyle (Ed.), Structural equation modeling: Concepts, issues and applications (pp. 56–75). Sage Publications.
69. Williamson, O. E. (1985). The economic institutions of capitalism. Free Press.
70. Yadav, S., Singh, S. P., & Raut, R. D. (2024). Mapping the adoption barriers of digital technologies in agri-food supply chains: A developing country perspective. Computers & Industrial Engineering, 186, 109746. https://doi.org/10.1016/j.cie.2023.109746
71. Yadav, S., & Singh, S. P. (2022). Modelling and analysis of sustainable cold chain agri-food supply chain considering carbon emission under stochastic demand. International Journal of Production Research, 60(4), 1318–1340. https://doi.org/10.1080/00207543.2020.1857876
72. Yamane, T. (1967). Statistics: An introductory analysis (2nd ed.). Harper and Row.
73. Zhao, X., Huo, B., Flynn, B. B., & Yeung, J. H. Y. (2013). The impact of power and relationship commitment on the integration between manufacturers and customers in a supply chain. Journal of Operations Management, 31(1–2), 52–68. https://doi.org/10.1016/j.jom.2012.07.004