Journal of Agriculture, Food Systems, and Community Development
ISSN: 2152-0801 online
https://foodsystemsjournal.org

Strategic mix priorities as drivers of agripreneurial performance: Evidence from smallholder organic vegetable farmers in Tamil Nadu State of India

K Raman [a] *
Sathyabama Institute of Science and Technology

Rani J. [b]
Sathyabama Institute of Science and Technology

Anubhuti Dwivedi [c]
EdMaestro Academy

Maroof Ahmad Mir [d]
Asian School of Business

Submitted March 5, 2025 / Revised May 8 and May 28, 2025 / Accepted May 29, 2025 / Published online August 6, 2025

Citation: Raman, K., J., Rani, Dwivedi, A., & Mir, M. A. (2025). Strategic mix priorities as drivers of agripreneurial performance: Evidence from smallholder organic vegetable farmers in Tamil Nadu State of India. *Journal of Agriculture, Food Systems, and Community Development*, *14*(4), 67–79. https://doi.org/10.5304/jafscd.2025.144.007

Abstract
The adoption of organic farming practices by smallholder vegetable farmers is gaining wide importance in emerging economies such as India. Though information is available on the adoption practices, attitudes, and other characteristics of farmers, a detailed analysis of the various elements of the strategic mix, as drivers of the performance of smallholder organic vegetable farmers is lacking. This study aims to address the issue by collecting primary data from 271 organic vegetable growers, covering 16 districts in Tamil Nadu, India. The effects of four important strategic priorities—cost reduction, networking, quality differentiation, and supply chain management—in driving farm performance were investigated. The results revealed that quality differentiation, supply chain management, and networking are significant and have a positive impact, whereas cost reduction as a strategy does not have any significant effect on the performance of smallholder organic vegetable

[a] * *Corresponding author:* K Raman, Research Scholar, Department of Management Studies, Sathyabama Institute of Science and Technology, Chennai, India; raman.k.dr@gmail.com; https://orcid.org/0000-0002-8603-3473

[b] Rani J., Associate Professor, Department of Management Studies, Sathyabama Institute of Science and Technology, Chennai, India; ranijvasanth@gmail.com; https://orcid.org/0000-0002-4144-5845

[c] Anubhuti Dwivedi, Director, EdMaestro Academy, Meerut, India; director@edmaestro.in; https://orcid.org/0000-0002-0640-9179

[d] Maroof Ahmad Mir, Professor & Dean, Asian School of Business, Noida, India; maroof.ahmad@asb.edu.in; https://orcid.org/0000-0002-6197-5528

farmers. Additional analysis also unravels insights about the relative importance of each of the strategic items. The findings from this study have significance for stakeholders such as agricultural extension workers, NGOs and farmer producer organizations (FPOs), and other policymakers who are involved in promoting supportive policies and for popularizing organic farming practices. The results also enrich the existing literature on the successful adoption of organic farming practices in economies like India, where organic farming is growing but has yet to reach its full potential.

Keywords
agripreneurship, organic farming, PLS-SEM, IPMA, strategic management, smallholder farmers, quality differentiation, supply chain management

Introduction

Agripreneurship, or agriculture-related entrepreneurial activity (Bairwa et al., 2014), is valued as a growth-propelling engine, primarily in generating employment and improving economic growth and development. Agripreneurship is not solely confined to farm and rural enterprise; it covers all the activities that are related to agriculture and are a part of the agri-value chain (Sharma et al., 2019). The concept of agripreneurship is well suited for farmers who adopt organic farming practices, since agripreneurship may involve switching over from a completely chemical-oriented farming system to environment-friendly natural and sustainable cultivation practices but also comprises the adoption of newer technologies and sustainable cultivation practices according to market opportunities (Wiklund & Shepherd, 2005). Organic farming is a natural, sustainable, and traditional farming system that does not involve any chemical fertilizers or chemical pesticides during the entire crop cycle or cropping period (Sadati et al., 2010).

In India, due to the demand for fresh, chemical-free, high-nutritive-value vegetables, the area used for certified organic farming practices is increasing (Agricultural and Processed Food Products Export Development Authority [APEDA], 2024). Organic vegetable growers, mostly on rural farmsteads with small holdings, form the bulk of the vegetable producers in India (Dev, 2012). According to the report from the Centre for Science and Environment (CSE, 2020), as of February 2020, 1.49 million farmers have adopted organic farming, covering an area of 0.59 million ha (1.46 million acres).

Among the different states in India, Tamil Nadu is ranked 15th in terms of area under organic cultivation, having around 42,758 hectares under organic cultivation (APEDA, 2024). The adoption rate of organic farming in Tamil Nadu is very low compared with the opportunities available for organic vegetable cultivation, in spite of the various initiatives taken by the government of India in launching the National Program for Organic Production (NPOP) as well as awareness campaigns from the State Department of Agriculture (Paramasivam et al., 2022). Low adoption practices of organic farming have been attributed to poor awareness, depletion of soil nutritional status, improper pest and disease management practices, lower crop yields, inadequate marketing facilities, poor technical expertise, economic and financial concerns, and lack of proper skills to manage the farms (Das et al., 2020). Just like any other business, farming also requires strategic decisions to be taken for making the farming profitable and sustainable. Business literature defines "strategic mix" as a combination of different business strategies such as marketing, finance, operations, human resources, and the innovations integrated into a business to attain its long-term goals and stand out from competitors (Wheelen & Hunger, 2012). Likewise, production strategy mix is about choices regarding resources, such as capacity of production, technology, and quality systems to help a firm to meet its goals for cost, quality, flexibility, and delivery (Slack et al., 2010). Marketing strategy mix primarily consists of the tactical components of the marketing strategy, blending product, price, promotion, and place decisions to create value for customers and achieve competitive advantage in the target market (Kotler & Keller, 2016). In the context of organic farming, the strategic mix primarily consists of elements related to production and marketing, as farmers as entrepreneurs are themselves the major financial and human resource.

In our present model, we have incorporated four important strategies of *cost reduction*, *quality dif-*

ferentiation, *networking*, and *supply chain management* as part of the overall strategic mix that affects the business performance of smallholder organic vegetable farmers, as per literature. Cost reduction and product differentiation based on features or quality are two major elements of business strategy applicable to all kinds of businesses (Magretta, 2012; Porter, 2011), including organic farming. Networking among peers has also been found to play a significant role in the success of organic farms, especially for small farmers (Cardoso et al., 2020). Another major aspect of strategic importance in organic farming is the strategic management of logistics, as the ability to manage supply chains effectively leads to an increase in the volume of output being produced and marketed (Sylvander et al., 2006). Therefore, these four elements can be considered to form the core of the organic farming strategic mix.

Though several reports are available on the socioeconomic characteristics as well as the attitude of smallholder farmers in adopting organic farming practices, information on the effect of elements of the strategic mix in improving organic farms' overall performance is lacking. The present study aims to fill the research gap by analyzing the impact of the various elements of the strategic mix responsible for the performance of smallholder organic vegetable growers in the state of Tamil Nadu in India.

Theoretical Framework and Hypotheses

Our hypothetical model includes the major elements of the strategic mix identified from agricultural literature that are impacting and driving the overall performance of smallholder organic vegetable farmers in Tamil Nadu. Helping traditional farmers to adopt organic farming practices can lead to social and economic acceptance of organic farming, thereby promoting natural cultivation practices. Strategic decision-making involves performing activities differently from those of other farmers in the market or performing activities similar to those being performed by other farmers but doing them in a different way (Porter, 2011). For instance, an entrepreneurial-oriented farmer develops a willingness to innovate a profitable agribusiness in an uncertain environment by continuously adopting newer farming techniques, growing value-added crops that are different from other farmers' crops, and exploring and exploiting new market opportunities (Lumpkin & Dess, 2001; Rosairo & Potts, 2016; Verhees et al., 2012). On the contrary, a market-oriented farmer focuses on growing quality crops and proactively adopts new marketing strategies, different from those of other competitors (Wiklund & Shepherd, 2005).

The role of strategic management in the performance of smallholder organic vegetable farmers is still not clear. For instance, due to constant adaptation to market opportunities, small farmers may lack rational, sequential, and formal strategic planning (O'Dwyer et al., 2009). Adopting organic farming practices is a high-cost activity requiring farmers to plan carefully. Factors such as market conditions, benefits and costs, and community support have been found to affect the adoption of organic farming practices by smallholder vegetable and fruit farmers (Nandi et al., 2015; Panneerselvam et al., 2012). Previous research has shown that while entrepreneurial-oriented farmers show a bigger preference for increasing the overall farm performance and reducing cultivation costs, market-oriented farmers focus on diversifying crop technologies and engaging with customers to improve their network (Verhees et al., 2012). There is a lack of studies that focus on an integrated framework combining various strategies in organic farming. It is important to research how the trade-offs between these strategies affect outcomes in this context.

The performance of farmers denotes the total income generated or profitability from the cultivation of vegetables (Verhees et al., 2012). Studies indicate that partnership, networking, and formal contracts as well as forward and backward linkages (Nain et al., 2019) for maximizing farm productivity and profitability for vegetable farmers are often either missing or less developed in the agricultural value chain. Likewise, product or quality diversification is a strategy that consists of growing different value-added crops, developing value-added products, or entering new market segments. Other studies have indicated that diversified farms achieve better profitability by catering to niche markets and reducing dependency on traditional crops (Gurr et al., 2016; Kittur et al., 2023). Crop product diversification is expected to create a positive influence on income stability and market expansion.

Based on the above discussion, we framed the following hypotheses to examine the effects of the elements of strategic mix in driving farm performance:

H1: A positive significant relationship exists between Strategic Cost-Reduction (SCR) and Performance (PERF).

H2: A positive significant relationship exists between Strategic Quality Differentiation (SQD) and Performance (PERF).

H3: A positive significant relationship exists between Strategic Networking with Farmers (SNW) and Performance (PERF).

H4: A positive significant relationship exists between Supply Chain Management (SCM) and Performance (PERF).

Research Methodology

The sampling method, measurement instrument used for data collection, and techniques of data analysis applied for the study are discussed in the following subsections.

Sampling

The survey data was collected from 16 districts of Tamil Nadu between June 2023 and August 2024, to include all three major cultivation seasons (April–May, July–August, and November–December). For calculating the required sample size, power analysis was conducted, which "is a method for determining the probability that a statistical test will detect effects of a specified size" (Cohen, 1988, p. 3). Power analysis is used to determine the minimum sample size required for a study based on the desired level of statistical power, the assumed significance level, the expected effect size, and the type of statistical test being conducted. Power analysis helps to ensure that the study is capable of detecting a true effect if one exists, thereby minimizing the risk of Type II errors and maximizing the power of the test. G*Power (Faul et al., 2009) software was used to conduct the power analysis, which suggested a minimum sample size of 262 respondents for achieving 95% power at 5% level of significance even if the effect size was as small as 0.05. Using purposive sampling, a total of 271 smallholder organic farmers were selected. The selected farmers followed sustainable farming practices and grew diverse vegetable crops during the cropping season. The sample consisted of 59% male and 41% female farmers. Approximately 70% of farmers had been educated up to the primary school level, 25% up to the secondary school level, and the other 5% were uneducated. In terms of land area, more than 80% owned land up to 2 acres (0.8 ha), and only 20% had larger land area for organic cultivation. Most of the farmers were in the age group of 30–50 years, with only 16% above 50 and 3% below 30 years of age.

Measurement Instrument

The instrument used to measure the variables in this study was developed as a formative index for the four strategic elements constructs and these were validated following the procedure outlined by Diamantopoulos and Winklhofer (2001). The formative index suits the context of this study, as there are various subaspects of each strategic element that may be focused upon differently by the farmers, and these substrategies may or may not be correlated to each other. Thus, it is imperative for the broad strategic element to be measured as a formative construct with items relating to different substrategies that form the overall strategic element (Diamantopoulos et al., 2008). The items for SCR, SQD, SNW, and SCM were framed based on the different ways in which the strategies of cost reduction, differentiation, networking, and supply chain management are carried out (King et al., 2010; Teece, 2010; Verhees et al., 2012).

Performance has been measured as a reflective construct by adapting items from previous studies (Love et al., 2015; Peel et al., 2015; Verhees et al., 2011). All the items of the instrument are presented in Table 1. The variables included in the study were measured using a 5-point Likert scale (1=*strongly disagree* to 5=*strongly agree*), with only PERF4 and PERF5 having different anchors, as mentioned in Table 1 (Love et al., 2015; Peel et al., 2015).

Table 1. Measurement Instrument

Construct	Items
SCR	I look for possibilities to reduce the production costs of organic vegetables and fruits for arriving at competitive selling prices.
	I grow other non-organic crops along with organic crops to reduce my overall average cost
	I track the direct costs of skilled laborers involved in organic cultivation practices.
	I track the Indirect costs involved in grading, packing, and certification of organic crops.
SQD	I believe in growing quality organic vegetables and fruits
	I believe in adopting the cultivation practices of other farmers for growing quality organic vegetables and fruits.
	I believe a high-quality product differentiation is needed to cater to the growing needs of "organic niche markets."
SNW	I closely coordinate with other fellow organic growers.
	I try and find out details of new varieties of organic crops grown by other farmers in the region.
	Focusing on my own expertise is more important than following the practices of other farmers.*
SCM	I believe studying the dynamics of the marketing channel model of organically grown crops is important.
	I work out the cost structure at each channel point.
	I analyze the time taken to move the product from farm to market or to end customers.
	I network well with all channel partners to deliver value to the customers.
PERF	Organic farming has been my primary source of income in the past 12 months.
	My organic farming business has been profitable in the past 12 months.
	I have a good profit margin on organic farming produce.
	What has been the overall position of your organic farming business? (1=*Huge Loss* to 5=*Highly Profitable*)
	How sustainable do you believe your organic business will be in the long run? (1=*Highly Unsustainable* to 5=*Highly Sustainable*)

* = Reverse coded

Analysis Method

The data collected was analyzed employing a partial least squares structural equation modeling (PLS-SEM) approach. Structural equation modeling (SEM) is a powerful technique for analyzing the relationships between latent variables measured through multiple observed variables (Hox & Bechger, 1999). There are two approaches of SEM: covariance-based SEM (CB-SEM) and variance-based SEM, or PLS-SEM. PLS-SEM is suited for the analysis of data that deviates from multivariate normality assumption, as in our study, with a significant Mardia's coefficient of skewness and kurtosis. Further, PLS-SEM has the capability for assessing formatively measured constructs, which makes this technique suitable for this study (Hair et al., 2011). Further, PLS-SEM is known for its high predictive relevance (Hair et al., 2017), which makes it a preferred technique for predicting the performance of organic farmers with the strategic mix elements as the predictors. SmartPLS4 was used to estimate the model results.

Results and Discussion

The model of the study was analyzed in two phases, as required in SEM. The first step was the assessment of the measurement model for examining the reliability and validity of constructs. The second step was to assess the structural model for the significant path relationships between the exogenous and endogenous constructs.

Measurement Model Results

The construct PERF, being reflective, was tested for reliability by checking the Cronbach's Alpha, Rho A, and Rho C values followed by convergent

Table 2. Reflective Construct Measurement Model Results

Reflective Construct	Item	Loading	Cronbach's Alpha	Rho A	Rho C	AVE
PERF	PERF1	0.679	0.809	0.815	0.867	0.567
	PERF2	0.769				
	PERF3	0.790				
	PERF4	0.739				
	PERF5	0.781				

validity through average variance extracted (AVE). Discriminant validity was not a concern in the model because all other constructs except PERF were formative, and therefore correlation-based discriminant validity measures like Heterotrait-Monotrait ratio of correlations (HTMT) were not relevant here (Sarstedt et al., 2021). It was found that all reliability measures for PERF were above the threshold of 0.7, and the AVE of the construct was above 0.5; hence, all the items were retained (Hair et al., 2022). Table 2 presents the results of the measurement model assessment of the reflective construct of performance (PERF).

The formative measurement model was assessed for validity using redundancy analysis by estimating the correlation of the construct measured through the formative items with a global single item representing that construct (Cheah et al., 2018). SCR, SQD, SNW, and SCM all exhibited this correlation with their global single item to be above 0.8, which satisfied the recommended threshold of 0.7 or above (Diamantopoulos et al., 2008; Hair et al., 2019). Further, the items were assessed for multicollinearity issues by checking the outer VIF values, and all values were found to be below 3, eliminating the possibility of collinearity issues (Diamantopoulos & Winklhofer, 2001). As the next step, item weights were checked for significance. Item weights refer to the relative contribution of each item in forming the construct (Hair et al., 2022). All weights were found to be significant except that of SCR1. However, the item loading (which refers to the absolute contribution of this item to the overall construct) of SCR1 was found to be above 0.5 and hence was retained (Hair et al., 2022). Table 3 presents the results of the formative constructs' measurement model assessment:

Table 3. Formative Constructs Measurement Model Results

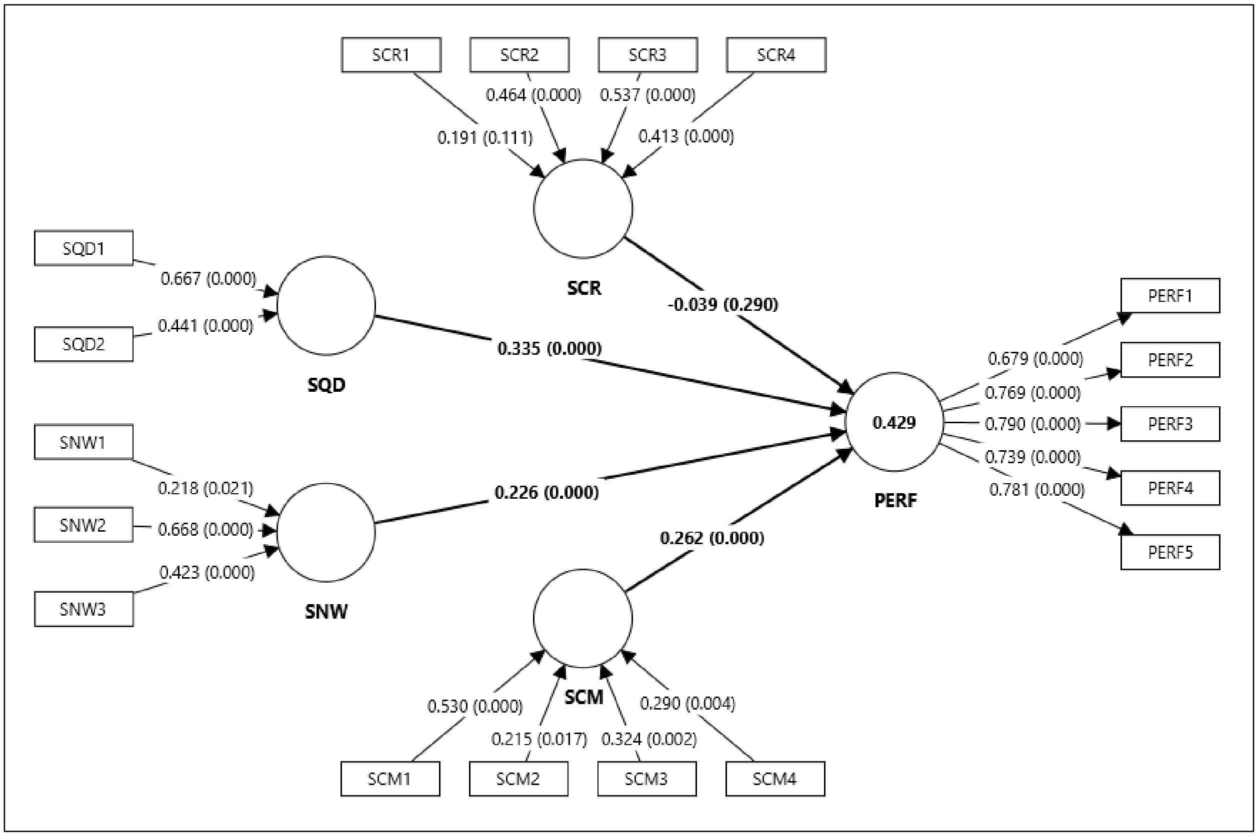
Formative Construct	Redundancy Coefficient	Item	Outer VIF	Outer Weight	Weight sig. (*p* value)	Outer loading
SCR	0.843	SCR1	1.144	0.191	0.111	0.506
		SCR2	1.108	0.464	0.000	0.552
		SCR3	1.148	0.537	0.000	0.768
		SCR4	1.162	0.413	0.000	0.569
SQD	0.866	SQD1	1.600	0.667	0.000	0.937
		SQD2	1.600	0.441	0.000	0.849
SNW	0.854	SNW1	1.716	0.218	0.021	0.760
		SNW2	1.557	0.668	0.000	0.866
		SNW3	1.135	0.423	0.000	0.604
SCM	0.867	SCM1	1.276	0.530	0.000	0.820
		SCM2	1.399	0.215	0.017	0.665
		SCM3	1.462	0.324	0.002	0.741
		SCM4	1.223	0.290	0.004	0.630

Structural Model Results

Structural model assessment begins with the examination of multicollinearity between the predictor constructs, as collinearity must be ruled out to ascertain that regression results are not biased (Hair et al., 2018). Inner VIF values were checked for the same, and no value was found to be above 3, ruling out any collinearity problem.

The path coefficients and their significance were then examined to interpret the effect of each of the strategic mix

Figure 1. Bootstrapping Results



elements on the performance of the organic farmers by running the bootstrapping procedure with 5,000 subsamples. The results of bootstrapping are depicted in Figure 1. Further, the explanatory power and predictive relevance of the model were assessed through the coefficient of determination R^2 (Hair et al., 2022) and PLSpredict-based Q^2 (Shmueli et al., 2019). Table 4 demonstrates the results of path relationships, and Table 5 gives the explanatory power, model fit, and predictive power of the structural model.

It can be seen from the results that all the hypotheses except H1 stand supported. Results show that the strategic elements of quality differentiation, networking with peers, and supply chain management have a significant positive effect on performance, but cost reduction as a strategic element does not affect the performance in any significant manner. This is an interesting finding that highlights the relatively insignificant role of cost

Table 4. Path Coefficients & Significance

Path	Inner VIF	Path Coefficient	*T* Statistic	*p*-value	Confidence Interval (Bias Corrected)		Hypothesis Test Inference
					5%	95%	
SCR → PERF	2.064	−0.039	0.553	0.290	−0.178	0.055	H1 not supported
SQD → PERF	1.743	0.335*	5.989	0.000	0.246	0.432	H2 supported
SNW → PERF	1.997	0.226*	3.843	0.000	0.128	0.322	H3 supported
SCM → PERF	1.608	0.262*	4.527	0.000	0.163	0.354	H4 supported

Note: * shows significant at 5%

Table 5. Explanatory Power, Model Fit & Predictive Power

Explanatory Power			Predictive Power	
Endogenous Variable	*R*-Square	*R*-Squared Adjusted	Q^2 (PLSpredict)	
Performance	0.429	0.422	Latent Variable Q^2	0.404
			Measured Variables Q^2	
			PERF1	0.233
			PERF2	0.199
			PERF3	0.178
			PERF4	0.166
			PERF5	0.331
Model Fit (SRMR): 0.08				

reduction in organic farming and shows that more emphasis must be given to innovative approaches for quality differentiation and supply chain management for creating value and enhancing performance. The role of peer networking is also significant for learning from other organic farmers and using their experience in making one's own performance better.

Table 5 exhibits the satisfactory explanatory and predictive power of the model, with the model explaining more than 40% of the variance in the dependent construct and all Q^2 values above zero (Shmueli et al., 2016). The model has an acceptable fit, exhibited through the SRMR value of 0.08, which is below the acceptable threshold of 0.1 (Hu & Bentler, 1999; Kock, 2020).

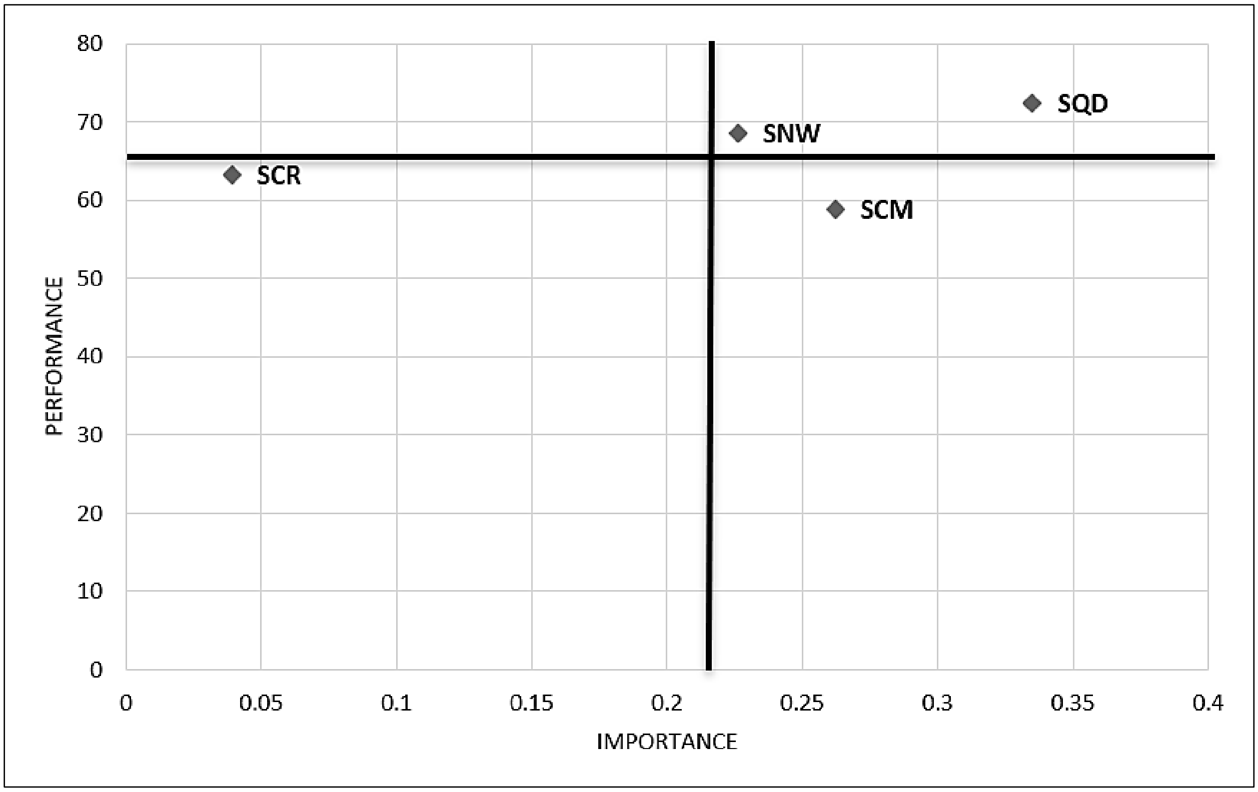
IPMA Results

Importance-performance map analysis (IPMA) provided deeper insights into the results and gave actionable insights for decisionmakers to take action on the priority areas. IPMA works by combining the total effect of a predictor on the dependent variable and its relative performance vis-á-vis other predictors (Ringle & Sarstedt, 2016). Figure 2 shows the IPMA result in four quadrants in graphical form, with the quadrants divided based on the average total effect and the average performance of the different predictor constructs on the dependent variable of Performance. It can be seen from the graph that the construct SQD has the maximum effect on performance and is also performing well, which implies that the organic farmers are focusing on quality-based differentiation to create a niche for themselves and expand their markets. However, SCM emerges from the IPMA results as a major area of concern, as it is the second most significant predictor, with a high total effect on performance but below-average performance. Therefore, SCM must be a priority area for organic farmers to improve and create more value in the chain, which has the potential to boost performance. SNW is above average in importance as well as performance and hence not a construct to be prioritized at present by the organic farmers, despite being significant. It is already performing well, with farmers networking with each other and learning from each other as a community. SCR lies in the lower left quadrant showing, that it is low in importance as well as performance. This shows that cost reduction as a strategy may not work well in improving performance in the context of organic farming. This may be because organic farming is more focused on delivering quality products to the customers for building trust and enhancing the reach in the market.

Conclusion and Implications

The present study utilized the PLS-SEM to explore the impact of the four important elements of the strategic mix namely, cost reduction, networking, quality differentiation, and supply chain management, as drivers of the performance of the smallholder organic vegetable growers, of Tamil Nadu, India. The analysis of the model based on the research hypotheses indicated that while three strategic elements, that is, networking, quality differentiation, and supply chain management, had a sign-

Figure 2. Importance–Performance Map Analysis



ificant positive effect, cost reduction as a strategic element did not show any significant effect on performance. This demonstrates that smallholder organic farmers should concentrate more on improving their quality of produce with crop diversification for better value addition as well as improve their networking and supply chain logistics with all stakeholders for sustainable development. The IPMA results also revealed that the construct of quality differentiation had the strongest effect on performance, followed by supply chain management. Networking with channel partners was found to be satisfactory. However, cost-reduction as a construct exhibited a lower priority, thereby indicating that farmers need to focus more on crop diversification and delivery of quality produce to meet the market and customer demands. The findings from the present study not only bridge the gaps in research on the effect of elements of strategic mix on the performance of smallholder organic vegetable farmers. This research is also useful for the policymakers and stakeholders who are actively involved in promoting organic cultivation of vegetables and helping farmers to practically implement effective strategies to do so. Policymakers, NGOs, and village-level agri-extension workers need to be involved in communicating the significance of product quality and differentiation over cost considerations to enhance the farmers' decision-making regarding adoption of organic farming.

The study carried out was based on a robust model with sound theoretical background; nonetheless, the results need to be interpreted with caution as there are some potential limitations. The conclusions in this study are based on the samples drawn from smallholder organic vegetable growers from only 16 districts of the state of Tamil Nadu. Thus, future researchers should extend the study to other regions so that the results can be generalized to larger sections. Secondly, future research should include more organically cultivated crops like cotton, paddy, wheat, maize, oilseeds, soybean, and plantains in the study so that the results can be generalized to a broader variety of crops. Despite these limitations, this study has significantly contributed to understanding the impact of strategic elements on decision-making, performance, and agripreneurial development among smallholder organic vegetable farmers in India.

Recommendations for Research, Policy, and Practice

The findings from this study have important implications for the adoption of organic farming practices by smallholder vegetable farmers in India and other emerging economies. To enhance the adoption of the cultivation of organic vegetables by smallholder farmers, the policymakers as well as agricultural extension officers, NGOs, and the link should consider the following actionable recommendations.

Training Program on Organic Farming Practices

Regular training programs on the organic cultivation of vegetable crops must be conducted for agricultural extension as well as NGOs to keep them updated on the latest agricultural practices, which they can disseminate to farmers. Through these regular programs, new training modules should introduce the need for organic crop diversification as well as the delivery of quality produce, rather than focusing merely on cost-reduction strategies.

Organic Certification and Accreditation

Adoption of organic certification and accreditation is still lacking as far as farming in India is concerned. This is evident from the low rates of adoption of organic farming practices compared to the total area under cultivation in India (Ramesh et al., 2010). The Department of Agriculture and Farmers Welfare under the Ministry of Agriculture should make policy decisions to recruit extension workers and agricultural officers to these certification programs for enhancing the awareness and reach of these programs. Some of the initiatives such as (a) group certifications via Farmer Producer Organization (FPO) and self-help groups, (b) digitalized registration of farmers through a single-window system, (c) financial support in the form of subsidies for certifications and renewals for those adopting eco-friendly practices, and (d) effective coordination among various departments such as the National Horticulture Board, the Directorate of Agricultural Marketing, and the organic certification body to implement the Tamil Nadu Organic Farming Policy (Agriculture-Farmers Welfare Department, 2023), will enable more smallholder farmers to obtain certification and produce value-added crops, both for domestic and export of fresh organic vegetables.

Adoption of Digital Technology

To improve supply chain and logistics in organic farming and expand the network between farmers and agricultural extension workers, policymakers should focus on developing and actively promoting digital platforms, mobile applications, and remote-sensing technologies. These tools can help extension workers and NGOs connect more easily with smallholder farmers and support them in making strategic decisions about organic cultivation when needed. Some of the suggested measures include (a) building trust and awareness through field-level demonstrations and showcasing success stories, (b)improving accessibility through distribution of free smartphones with internet connectivity along with user-friendly customized apps, (c) incentivizing adopting technologies such as soil-based sensors, GPS, and drones, and (d) popularizing the prime minister's Kisan (PM-KISAN) and AgriStack schemes, for collecting real-time crop-specific data and monitoring of pests, diseases, and climate changes. Providing such low-cost technologies will not only enhance awareness on the benefits of adopting organic farming practices but also help smallholder producers to market their produce in distant markets, through e-commerce platforms such as Uzhavu Organic and Chennai Angadi for marketing certified organic fresh fruits and vegetables.

Support Farmer Producer Organizations (FPOs)

As the findings suggest, supply chain management is an important factor in influencing farm performance, but this factor has not been performing well because of organic farmers' lesser focus on this aspect. The Government of India has initiated the National Programme for Organic Production (NPOP), National Mission for Sustainable Agriculture (NMSA), and Paramparagat Krishi Vikas Yojana (PKVY) for promoting nationwide cultivation of organic farming. In addition, the state of

Tamil Nadu has launched intensive programs such as Sustainable Agricultural Practices (SAP) with the purpose of driving organic production practices. These governmental agencies should partner with FPOs at the grassroot level to strengthen the promotion of organic farming practices as well as extend logistic supports for procurement and marketing of fresh organic produce in order to improve value in supply chain.

Promotion Through Self-help Groups (SHG)

Social networking among farmers has been found to be effective in improving organic farm performance. The Government of India recently launched the Atmanirbhar Bharat (Self-reliant India), and is promoting women's self-help groups (SHG). These women's SHG should be targeted to promote the concept of organic farming practices. Such a community movement will help to sustainably build peer-to-peer knowledge, dissemination networks for advice, and for organic cultivation practices.

Focus on Organic Crop-Based Research

Findings suggest that quality differentiation plays a crucial role in making organic farms perform well. Therefore, central as well as state agricultural universities in India should give more attention to research on the cultivation of organic products and effective farming practices under their ongoing schemes, such as precision farming, and extend their research to include more varieties of value-added crops such as cotton, soybean, oilseeds, and fruit crops, where the use of chemical pesticides is alarming, leading to residual problems.

References

Agricultural and Processed Food Products Export Development Authority [APEDA]. (2024). *Study of Indian organic market and export promotion strategy*. https://organic.apeda.gov.in/sites/default/files/2025-01/Final_Report_Indian_Organic_Market_Export_Promotion_Strategy_CRISIL291124.pdf

Agriculture-Farmers Welfare Department. (2023). *Tamil Nadu Organic Farming Policy 2023*. Government of Tamil Nadu. https://agritech.tnau.ac.in/pdf/66617733-Tamil-Nadu-Organic-Farming-Policy-2023_230315_093042.pdf

Bairwa, S. L., Lakra, K., Kushwaha, S., Meena, L. K., & Kumar, P. (2014). Agripreneurship development as a tool to upliftment of agriculture. *International Journal of Scientific and Research Publications*, *4*(3), 1-4. https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=489a58671771ee78648946f63d08a4edf44e482e

Centre for Science and Environment [CSE]. (2020). *State of organic and natural farming in India: Challenges and possibilities.* https://www.cseindia.org/state-of-organic-and-natural-farming-in-india-10346

Cardoso, J. D. F., Casarotto Filho, N., & Marcon, C. (2020). Small business networks in the field of organic farming: Strategies and management tools. *Gestão & Produção*, *27*(4), Article e4730. https://doi.org/10.1590/0104-530X4730-20

Cheah, J.-H., Sarstedt, M., Ringle, C. M., Ramayah, T., & Ting, H. (2018). Convergent validity assessment of formatively measured constructs in PLS-SEM: On using single-item versus multi-item measures in redundancy analyses. *International Journal of Contemporary Hospitality Management*, *30*(11), 3192–3210. https://doi.org/10.1108/IJCHM-10-2017-0649

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Routledge.

Das, S., Chatterjee, A., & Pal, T. K. (2020). Organic farming in India: a vision towards a healthy nation. *Food Quality and Safety*, *4*(2), 69–76. https://doi.org/10.1093/fqsafe/fyaa018

Dev, S. M. (2012). *Small farmers in India: Challenges and opportunities* [IGIDR Working Paper] (WP-2012-014), Indira Gandhi Institute of Development Research. http://www.igidr.ac.in/pdf/publication/WP-2012-014.pdf

Diamantopoulos, A., Riefler, P., & Roth, K. P. (2008). Advancing formative measurement models. *Journal of Business Research*, *61*(12), 1203–1218. https://doi.org/10.1016/j.jbusres.2008.01.009

Diamantopoulos, A., & Winklhofer, H. M. (2001). Index construction with formative indicators: An alternative to scale development. *Journal of Marketing Research*, *38*(2), 269–277. https://doi.org/10.1509/jmkr.38.2.269.18845

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, *41*(4), 1149–1160. https://doi.org/10.3758/BRM.41.4.1149

Gurr, G. M., Lu, Z., Zheng, X., Xu, H., Zhu, P., Chen, G., Yao, X., Cheng, J., Zhu, Z., Catindig, J. L., Villareal, S., Van Chien, H., Cuong, L. Q., Channoo, C., Chengwattana, N., Lan, L. P., Hai, L. H., Chaiwong, J., Nicol, H. I., … Heong, K. L. (2016). Multi-country evidence that crop diversification promotes ecological intensification of agriculture. *Nature Plants*, *2*(3), Article 16014. https://doi.org/10.1038/nplants.2016.14

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2018). *Multivariate data analysis* (8th ed.). Cengage Learning EMEA.

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). *A primer on partial least squares structural equation modeling* (3rd ed.). Sage Publications.

Hair, J. F., Matthews, L. M., Matthews, R. L., & Sarstedt, M. (2017). PLS-SEM or CB-SEM: Updated guidelines on which method to use. *International Journal of Multivariate Data Analysis*, *1*(2), 107–123. https://doi.org/10.1504/IJMDA.2017.087624

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing Theory and Practice*, *19*(2), 139–152. https://doi.org/10.2753/MTP1069-6679190202

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, *31*(1), 2–24. https://doi.org/10.1108/EBR-11-2018-0203

Hox, J. J., & Bechger, T. M. (1999). An introduction to structural equation modeling. *Family Science Review*, *11*, 354–373. https://www.researchgate.net/publication/27706391

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, *6*(1), 1–55. https://doi.org/10.1080/10705519909540118

King, R. P., Boehlje, M., Cook, M. L., & Sonka, S. T. (2010). Agribusiness economics and management. *American Journal of Agricultural Economics*, *92*(2), 554–570. https://doi.org/10.1093/ajae/aaq009

Kittur, B. H., Upadhyay, A. P., Jhariya, M. K., Raj, A., & Banerjee, A. (2023). Agroforestry for resource diversification and sustainable development. In M. K. Jhariya, R. S. Meena, & A. Raj (Eds.), *Agroforestry for Carbon and Ecosystem Management* (pp. 19–32). Elsevier. https://doi.org/10.1016/B978-0-323-95393-1.00028-2

Kock, N. (2020). Using indicator correlation fit indices in PLS-SEM: Selecting the algorithm with the best fit. *Data Analysis Perspectives Journal*, *1*(4), 1–4. https://scriptwarp.com/dapj/2020_DAPJ_1_4/Kock_2020_DAPJ_1_4_XsCorrMatrixIndices.pdf

Kotler, P., & Keller, K. L. (2016). *Marketing management* (15th ed.). Pearson Education.

Love, D. C., Fry, J. P., Li, X., Hill, E. S., Genello, L., Semmens, K., & Thompson, R. E. (2015). Commercial aquaponics production and profitability: Findings from an international survey. *Aquaculture*, *435*, 67–74. https://doi.org/10.1016/j.aquaculture.2014.09.023

Lumpkin, G. T., & Dess, G. G. (2001). Linking two dimensions of entrepreneurial orientation to firm performance: The moderating role of environment and industry life cycle. *Journal of Business Venturing*, *16*(5), 429–451. https://doi.org/10.1016/S0883-9026(00)00048-3

Magretta, J. (2012). *Understanding Michael Porter: The essential guide to competition and strategy*. Harvard Business Press.

Nain, M. S., Singh, R., Mishra J R, Sharma, J. P., Singh, A. K., Kumar, A., Gills, R., & Suman, R. S. (2019). Maximising farm profitability through entrepreneurship development and farmers' innovations: Feasibility analysis and action interventions. *Indian Journal of Agricultural Sciences*, *89*(6), 1044–1049. http://dx.doi.org/10.56093/ijas.v89i6.90833

Nandi, R., Bokelmanna, W., Nithya, V. G., & Dias, G. (2015). Smallholder organic farmer's attitudes, objectives and barriers towards production of organic fruits and vegetables in India: A multivariate analysis. *Emirates Journal of Food & Agriculture*, *27*(5), 396–406. https://doi.org/10.9755/ejfa.2015.04.038

O'Dwyer, M., Gilmore, A., & Carson, D. (2009). Innovative marketing in SMEs. *European Journal of Marketing*, *43*(1), 46–61. https://doi.org/10.1108/03090560910923238

Panneerselvam, P., Halberg, N., Vaarst, M., & Hermansen, J. E. (2012). Indian farmers' experience with and perceptions of organic farming. *Renewable Agriculture and Food Systems*, *27*(2), 157–169. https://doi.org/10.1017/S1742170511000238

Paramasivam, S., Henry, P., Seethapathy, P., & Rajamohan, T. (2022). A strategic model for empowering farmers by improving livelihood security through organic farming practices in Tamil Nadu, India. *Journal of Agricultural Sciences – Sri Lanka*, *17*(3), 471–483. https://doi.org/10.4038/jas.v17i3.9926

Peel, D., Berry, H. L., & Schirmer, J. (2015). Perceived profitability and well-being in Australian dryland farmers and irrigators. *Australian Journal of Rural Health*, *23*(4), 207–214. https://doi.org/10.1111/ajr.12176

Porter, M. E. (1996). What is strategy? *Harvard Business Review*. https://hbr.org/1996/11/what-is-strategy

Ramesh, P., Panwar, N. R., Singh, A. B., Ramana, S., Yadav, S. K., Shrivastava, R., & Subba Rao, A. (2010). Status of organic farming in India. *Current Science*, *98*(9), 1190–1194. https://www.jstor.org/stable/24110148

Ringle, C. M., & Sarstedt, M. (2016). Gain more insight from your PLS-SEM results: The importance-performance map analysis. *Industrial Management and Data Systems*, *116*(9), 1865–1886. https://doi.org/10.1108/IMDS-10-2015-0449

Rosairo, H. S. R., & Potts, D. J. (2016). A study on entrepreneurial attitudes of upcountry vegetable farmers in Sri Lanka. *Journal of Agribusiness in Developing and Emerging Economies*, *6*(1), 39–58. https://doi.org/10.1108/JADEE-07-2014-0024

Sadati, S. A., Fami, H. S., Kalantari, K., Mohamadi, Y., & Asakere, A. (2010). Investigating effective factors on attitude of paddy growers towards organic farming: A case study in Babol County in Iran. *Research Journal of Applied Sciences, Engineering and Technology*, *2*(4), 362–367. https://maxwellsci.com/print/rjaset/v2-362-367.pdf

Sarstedt, M., Ringle, C. M., & Hair, J. F. (2021). Partial least squares structural equation modeling. In C. Homburg, M. Klarmann, & A. Vomberg (Eds.), *Handbook of market research* (pp. 1–47). Springer International Publishing. https://doi.org/10.1007/978-3-319-05542-8_15-2

Sharma, A., Bhooshan, N., Singh, A., Deshmukh, S. S., & Patra, S. P. (2019). Portrait of an agripreneur of India: An acceleration study. *The Indian Journal of Agricultural Sciences*, *89*(11). https://doi.org/10.56093/ijas.v89i11.95316

Shmueli, G., Ray, S., Velasquez Estrada, J. M., & Chatla, S. B. (2016). The elephant in the room: Predictive performance of PLS models. *Journal of Business Research*, *69*(10), 4552–4564. https://doi.org/10.1016/j.jbusres.2016.03.049

Shmueli, G., Sarstedt, M., Hair, J. F., Cheah, J.-H., Ting, H., Vaithilingam, S., & Ringle, C. M. (2019). Predictive model assessment in PLS-SEM: Guidelines for using PLSpredict. *European Journal of Marketing*, *53*(11), 2322–2347. https://doi.org/10.1108/EJM-02-2019-0189

Slack, N., Chambers, S., & Johnston, R. (2010). *Operations management* (6th ed.). Pearson Education.

Sylvander, B., & Schieb-Bienfait, N. (2006). The strategic turn of organic farming in Europe: From a resource based to an entrepreneurial approach of organic marketing initiatives. In T. Marsden & J. Murdoch (Eds.), *Research in rural sociology and development: Vol. 12. Between the local and the global* (pp. 323–358). Emerald Group Publishing Limited. https://doi.org/10.1016/S1057-1922(06)12013-2

Teece, D. J. (2010). Business models, business strategy and innovation. *Long Range Planning*, *43*(2–3), 172–194. https://doi.org/10.1016/j.lrp.2009.07.003

Verhees, F. J. H. M., Lans, T., & Verstegen, J. A. A. M. (2011, September 2). *Entrepreneurial proclivity, market orientation and performance of Dutch farmers and horticultural growers*. EAAE 2011 Congress: Change and Uncertainty, Zurich, Switzerland. https://www.researchgate.net/publication/239805215

Verhees, F. J. H. M., Lans, T., & Verstegen, J. A. A. M. (2012). The influence of market and entrepreneurial orientation on strategic marketing choices: The cases of Dutch farmers and horticultural growers. *Journal on Chain and Network Science*, *12*(2), 167–180. https://doi.org/10.3920/JCNS2012.x011

Wheelen, T. L., & Hunger, J. D. (2012). *Strategic management and business policy: Toward global sustainability* (13th ed.). Pearson.

Wiklund, J., & Shepherd, D. (2005). Entrepreneurial orientation and small business performance: A configurational approach. *Journal of Business Venturing*, *20*(1), 71–91. https://doi.org/10.1016/j.jbusvent.2004.01.001