

Quality Standards and Export Performance: Evidence from Pakistan's Citrus (Kinnow) Industry

Asif Maqbool¹, Abdul Ghafoor², Asghar Ali³, Waseem Ahmad⁴

¹Phd Scholar, Institute of Business Management Sciences, University of Agriculture, Faisalabad, Pakistan,

Email: asif.maqbool@uaf.edu.pk

²Institute of Business Management Sciences, University of Agriculture, Faisalabad, Pakistan,

Email: ghafoor@uaf.edu.pk

³Institute of Agricultural and Resource Economics, University of Agriculture, Faisalabad, Pakistan,

Email: asghar.ali@uaf.edu.pk

⁴Institute of Business Management Sciences, University of Agriculture, Faisalabad, Pakistan,

Email: waseem@uaf.edu.pk

Abstract

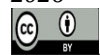
This study investigates the nexus between quality standards and export performance of Pakistan's citrus (Kinnow) industry. Grounded in the Resource-Based View (RBV), Dynamic Capability Theory (DCT), and Core Competency Theory, the research examines how Quality Standards Compliance (QSC), Total Quality Management (TQM), and Entrepreneurial Export Orientation (EEO) influence Export Performance (EP), with Export Market Orientation (EMO) as a mediating variable. Primary data were collected from 90 Kinnow export firms in District Sargodha, Punjab Pakistan's citrus capital using structured questionnaires. Data analysis was done using SmartPLS 4.0's partial least squares structural equation modeling (PLS-SEM). The findings suggest that whereas QSC and EEO have no discernible direct effects, TQM and EMO have a considerable and favorable impact on export performance. The QSC–EP and TQM–EP correlations, however, are strongly mediated by EMO, highlighting market orientation as the crucial link between internal quality capabilities and export results. The study concludes by offering targeted policy and managerial recommendations to strengthen export performance and improve the global competitiveness of Pakistan's Citrus industry.

Keywords: Quality Standards Compliance, Entrepreneurial Export Orientation, Export Market Orientation, Export Performance, Kinnow, Pakistan

Introduction

With fresh and processed fruits and vegetables making up more than half of developing countries' agricultural exports, international trade in agri-food commodities has grown dramatically in recent decades (FAO, 2022). Pakistan's citrus industry, in particular Kinnow mandarins grown in Punjab's fertile plains, plays a key role in this landscape. Kinnow accounts for about 30% of Pakistan's total horticultural exports, with District Sargodha alone producing more than 60% of the country's total Kinnow production (PHDEC, 2023; TDAP, 2024).

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Corresponding Author Email: ghafoor@uaf.edu.pk

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Pakistan's share of the global citrus market is barely 1.5%, despite this comparative advantage (TDAP, 2024). From 460,000 metric tons for USD 253 million in 2020 to roughly 250,000 metric tons worth USD 160 million in 2024, kinnow exports have drastically decreased (PBS, 2024). This concerning tendency during a thirteen-year period is seen in Table 1 below, highlighting the significance of the study subject.

Table 1: Kinnow Production and Export Trends in Pakistan (2011–2024)

Year	Area (ha)	Production (MT)	Export (MT)	Export Value (USD '000)	% Exported
2011–12	193,985	2,147,000	386,910	155,877	18.0%
2013–14	193,669	2,167,719	434,243	192,577	20.0%
2015–16	192,200	2,344,000	402,218	170,581	17.2%
2017–18	188,000	2,250,000	389,000	172,000	17.3%
2019–20	183,500	2,150,000	375,000	170,000	17.4%
2020–21	180,000	2,100,000	460,000	253,000	21.9%
2021–22	178,000	2,000,000	380,000	210,000	19.0%
2022–23	183,000	2,229,520	300,000	220,000	13.5%
2023–24	181,000	2,100,000	250,000	160,000	14.6%

Source: TDAP, 2024

Deeper structural issues, such as a lack of adherence to international quality standards, insufficient cold chain infrastructure, an excessive dependence on unofficial low-end markets, and a poor integration of quality management into export strategy, are reflected in this declining trend. Market access increasingly depends on adhering to internationally recognized standards like Global GAP, HACCP, and ISO 22000, especially in the European Union, Gulf States, and East Asia. However, there is insufficient institutional support, high certification fees, and incomplete enforcement in underdeveloped countries like Pakistan (UNCTAD, 2022).

Although considerable research investigates quality standards and firm performance separately, there is limited exploration of their joint impact on export performance in Pakistan's citrus industry. Moreover, the mediating function of export market orientation concerning a firm's ability to collect, share, and react to global market information is still inadequately theorized in this context. This research fills these gaps by suggesting and evaluating a comprehensive framework that investigates the impacts of QSC, TQM, and EEO on EP, with EMO serving as a mediator, in Punjab's citrus export industry.

Research Objectives

The study pursues the following objectives:

1. To investigate the effects of quality standards compliance, total quality management and entrepreneurial export orientation on export performance.
2. To analyze how quality standards compliance, total quality management and entrepreneurial export orientation influence export market orientation.

3. To examine the mediating role of export market orientation between quality standards compliance, total quality management, entrepreneurial export orientation and export performance.
4. To suggest policy recommendations for enhancing Pakistan's citrus industry.

Literature Review and Hypotheses

Export Performance (EP)

Export performance denotes a firm's ability to meet its objectives by leveraging resources and competencies in global markets (Katsikeas et al., 2000). It includes economic indicators (profits, sales, market share), non-economic indicators (market and product results), and strategic indicators (meeting export targets). Elements affecting export performance include internal capabilities like quality management, entrepreneurial mindset, company size, and managerial skills, as well as external factors such as logistics infrastructure, adherence to regulations, and assistance from the government (Leonidou et al., 2002; Alvarez, 2004). In Pakistan's citrus industry, falling export levels indicate a combination of compliance issues, structural challenges, and strategic misalignment (Ahmad et al., 2018).

Quality Standards Compliance (QSC)

Compliance with quality standards indicates a firm's dedication to embracing, enforcing, and consistently following established quality standards (Shmiln, 2017). Certifications like Global GAP, HACCP, and ISO 22000 function both as market entry prerequisites and as tools for strategic differentiation. Studies show that ISO 9000 certification enhances export performances by indicating product dependability and easing entry into markets (Guasch et al., 2007; Potoski, 2009). In developing countries, adherence is limited by expensive certification fees, lack of technical expertise, and insufficient institutional assistance (Konefal et al., 2005). For exporters of citrus from Pakistan, failure to comply has resulted in product rejections, harmed relationships with buyers, and exclusion from regulated markets.

H1: There exists a significant relationship between quality standards compliance and export performance.

H4: A significant relationship exists between quality standards compliance and export market orientation.

Total Quality Management (TQM)

TQM is an all-encompassing management approach focused on consistent enhancement throughout all organizational areas, guaranteeing that goods and services fulfill or surpass customer expectations (Demirbag et al., 2006). Its main dimensions comprise leadership dedication, customer orientation, employee involvement, supplier relations, process oversight, and ongoing enhancement. Studies consistently associate TQM with enhanced operational efficiency, customer satisfaction, and export outcomes (Abeykoon and de Alwis, 2016; Lages et al., 2009). For citrus exporters, TQM approaches directly impact post-harvest handling standards, grading consistency, hygiene in packing facilities, and lasting buyer trust.

H2: There exists a significant relationship between total quality management and export performance.

H5: There is a significant relationship between total quality management and export market orientation.

Entrepreneurial Export Orientation (EEO)

Export-oriented entrepreneurship indicates a firm's tendency to innovate, embrace calculated risks, and proactively seek international market opportunities (Lumpkin and Dess, 1996; Shan et al., 2016). Its three fundamental aspects creativity, willingness to take risks, and being proactive allow companies to recognize export prospects, distinguish their products, and attain first-mover benefits in international markets. Evidence generally indicates a favorable link between EEO and export performance, although contextual elements such as resource limitations and market traits can influence this connection (Abiodun and Rosli, 2014).

H3: There is a significant relationship between entrepreneurial export orientation and citrus firm export performance.

H6: There exists a significant relationship between entrepreneurial export orientation and export market orientation.

Export Market Orientation (EMO)

Export market orientation refers to the methods through which a firm produces, shares, and reacts to market information related to its global clients and rivals (Cadogan et al., 2002). EMO includes three processes: intelligence creation, intelligence distribution, and responsiveness. Studies show that firms with enhanced EMO attain better export results by more effectively aligning with global market trends (Singh and Mahmood, 2013; Samson and Mahmood, 2015). EMO is suggested to act as a mediator in the connections between internal capabilities (QSC, TQM, EEO) and export performance.

H7: There exists a significant relationship between export market orientation and export performance.

H8: Export market orientation mediates the relationship between quality standards compliance and export performance.

H9: Export market orientation mediates the relationship between total quality management and export performance.

H10: Export market orientation mediates the relationship between entrepreneurial export orientation and export performance.

Theoretical Framework

The research combines three supportive theoretical viewpoints. The Resource-Based View (Barney, 1991) illustrates how the quality of internal resources, TQM capabilities, and entrepreneurial characteristics generate a competitive edge. Dynamic Capability Theory (Teece et al., 1997) describes how companies adjust and reorganize their resources in reaction to fluctuating global

market environments. Core Competency Theory (Prahalad and Hamel, 1990) recognizes quality compliance abilities as strategic competencies that are challenging to replicate. Collectively, these frameworks offer a unified foundation for analyzing how internal abilities convert through EMO into results in export performance.

Research Methodology

Research Design and Study Area

The research utilizes a positivist philosophical framework and implements a quantitative, cross-sectional survey approach (Saunders et al., 2009). Data were gathered from citrus export firms in District Sargodha, the citrus hub of Punjab, Pakistan, which represents more than 60% of the country's Kinnow output (PHDEC, 2023). A dual-phase strategy was executed: Phase One included semi-structured qualitative interviews with ten prominent industry stakeholders to enhance the survey tool; Phase Two utilized a structured questionnaire survey distributed to 90 Kinnow export firms throughout Sargodha, Bhalwal, Kot Momin, and Sillanwali Tehsils during the 2024 (December–March) export season.

Sample and Measurement

Firms directly involved in Kinnow exporting were selected using purposive sampling. The intended respondent was the owner or export manager (single-informant approach; Kumar et al., 1993). All constructs were assessed using validated multi-item scales rated on a five-point Likert scale: Export Performance EP (6 items; Katsikeas et al., 2000; Shoham, 1998); Quality Standards Compliance QSC (5 items; Al Qudah et al., 2018; Adesanya et al., 2021); Total Quality Management TQM (6 items; Shafiq et al., 2017); Entrepreneurial Export Orientation EEO (5 items; Boso et al., 2012); and Export Market Orientation EMO (6 items; Cadogan et al., 2001). Two items (EP6R, EMO6R) were coded in reverse to identify response bias.

Data Analysis

Data were processed with SPSS 25 for descriptive analysis and SmartPLS 4.0 for PLS-SEM. The analytical process involved: (i) identifying outliers using Mahalanobis Distance (D^2 ; critical value $\chi^2 = 18.467$ at $df = 4$, $p < 0.001$); (ii) assessing normality through skewness and kurtosis (all values within ± 3 ; Kline, 1998); (iii) evaluating multicollinearity with VIF (all values < 2.0); (iv) assessing the measurement model (reliability: Cronbach's α , CR; validity: AVE, Fornell-Larcker Criterion, HTMT); and (v) evaluating the structural model through path coefficients, R^2 , f^2 , and bootstrapping (5,000 resamples) to test significance and analyze mediation.

Results

Respondents and Firm Profile

Table 2 displays the demographic and company profile of the 90 participants. The sample primarily consisted of males (95.55%), with most individuals aged between 31 and 40 years (38.88%) and possessing graduate degrees (32.22%). The majority of firms possessed more than 15 years of export experience (47.77%) and were incorporated as private limited entities (55.56%), indicating a seasoned and structured export industry.

Table 2: Respondents and Firm Profile (n = 90)

Characteristics	Category	Frequency	Percentage (%)
Age	Less than 30 years	13	14.44
	31–40 years	35	38.88
	41–50 years	23	25.55
	Above 50 years	19	21.11
Gender	Male	86	95.55
	Female	4	4.45
Education	Matriculation	6	6.66
	Intermediate	25	27.77
	Graduate	29	32.22
	Masters	23	25.55
Export Exp.	Up to 5 Years	8	8.90
	6–15 Years	39	43.33
	Above 15 Years	43	47.77
Employees	Under 50	41	45.55
	51–100	31	34.45
	Above 100	18	20.00
Legal Status	Sole Proprietorship	28	31.11
	Partnership	12	13.33
	Private Limited Company	50	55.56

Source: Author's own calculations

Descriptive Statistics of Key Constructs

Table 3 displays the descriptive statistics for all five constructs. All items scored over 4.0 on a five-point scale, signifying widespread strong agreement among the sampled firms. The smallest standard deviations are found for EP and TQM items, indicating strong internal consistency in the responses. QSC4 (regular auditing) had the highest mean (4.40), whereas EEO4 (risk-taking) recorded the lowest (4.05), indicating some differences in entrepreneurial risk appetite among firms.

Table 3: Descriptive Statistics of Study Constructs

Construct			No. of Items	Mean Range	SD Range	Cronbach's α
Quality Standards Compliance (QSC)			5	4.18 – 4.40	0.46 – 0.61	0.782
Total Quality Management (TQM)			6	4.08 – 4.25	0.40 – 0.47	0.710
Entrepreneurial Export Orientation (EEO)			5	4.05 – 4.22	0.42 – 0.48	0.736
Export Market Orientation (EMO)			6	3.95 – 4.20	0.42 – 0.47	0.769
Export Performance (EP)			6	3.98 – 4.22	0.42 – 0.47	0.840

Source: Author's own calculations

Measurement Model Assessment

Table 4 shows the results of the measurement model. All constructs met the internal consistency criteria (Cronbach's $\alpha \geq 0.70$; CR ≥ 0.821) and fulfilled the requirements for convergent validity (AVE ≥ 0.52 ; Fornell and Larcker, 1981; Hair et al., 2021). Factor loadings varied from 0.40 to 0.76, all exceeding the acceptable limit of 0.40 (Hair et al., 2014).

Table 4: Measurement Model Assessment

Construct	Items	Loadings	Cronbach's α	CR	AVE
EEO	EEO2, EEO3, EEO4, EEO5	0.754 – 0.756	0.736	0.834	0.557
QSC	QSC1–QSC5	0.435 – 0.475	0.782	0.850	0.532
TQM	TQM2, TQM3, TQM4, TQM6	0.402 – 0.492	0.710	0.821	0.534
EMO	EMO1–EMO3, EMO5, EMO6R	0.443 – 0.494	0.769	0.844	0.520
EP	EP1–EP5, EP6R	0.404 – 0.497	0.840	0.882	0.532

Source: Author's own calculations

Table 5 shows the Fornell-Larcker criterion concerning discriminant validity. The square root of the AVE for each construct (diagonal values in bold) surpasses its correlations with every other construct, validating sufficient discriminant validity (Fornell and Larcker, 1981).

Table 5: Fornell-Larcker Criterion

Constructs	EEO	EMO	EP	QSC	TQM
EEO	0.746				
EMO	0.314	0.721			
EP	0.440	0.477	0.746		
QSC	0.243	0.421	0.355	0.729	
TQM	0.185	0.243	0.312	0.177	0.731

Source: Author's own calculations

Table 6 displays the Heterotrait-Monotrait (HTMT) ratios. Every HTMT value remains below the conservative limit of 0.85 (Henseler et al., 2015), further validating the discriminant validity.

Table 6: Heterotrait-Monotrait (HTMT) Ratios

Constructs	EEO	EMO	EP	QSC	TQM
EEO	–				
EMO	0.72	–			
EP	0.65	0.75	–		
QSC	0.60	0.70	0.67	–	
TQM	0.68	0.66	0.66	0.62	–

Source: Author's own calculations

Structural Model: Direct Effects

Table 7 shows the results of the direct path coefficients obtained via bootstrapping (5,000 resamples). TQM showed a statistically significant positive impact on EP ($\beta = 0.168$, $t = 4.086$, p

< 0.01), thus confirming H2. QSC and EEO did not show notable direct impacts on EP (H1 and H3 unsupported). Concerning the antecedents of EMO: QSC was a significant predictor of EMO ($\beta = 0.248$, $t = 5.203$, $p < 0.01$, H4 confirmed); TQM was a positive predictor of EMO ($\beta = 0.148$, $t = 3.606$, $p < 0.01$, H5 confirmed); EEO did not significantly predict EMO (H6 not confirmed). EMO had a significant and positive impact on EP ($\beta = 0.289$, $t = 5.429$, $p < 0.01$, H7 supported).

Table 7: Direct Effects Results

Hyp.	Path	β	Std. Dev.	t-value	p-value	f ²	Decision
H1	QSC → EP	0.135	0.043	1.495	0.079	0.01	Not Supported
H2	TQM → EP	0.168	0.040	4.086	0.000***	0.132	Supported
H3	EEO → EP	0.182	0.046	1.695	0.090	0.087	Not Supported
H4	QSC → EMO	0.248	0.048	5.203	0.000***	0.040	Supported
H5	TQM → EMO	0.148	0.040	3.606	0.000***	0.090	Supported
H6	EEO → EMO	0.130	0.041	1.910	0.068	0.052	Not Supported
H7	EMO → EP	0.289	0.054	5.429	0.000***	0.174	Supported

Source: Author's own calculations

Mediation Analysis

Table 8 presents the results of the mediation analysis. EMO notably mediated the QSC–EP connection ($\beta = 0.101$, $t = 4.402$, $p < 0.01$, H8 supported) and the TQM–EP connection ($\beta = 0.043$, $t = 2.922$, $p < 0.01$, H9 supported). No noteworthy mediation was identified for the EEO–EP pathway ($\beta = 0.061$, $t = 1.411$, $p = 0.059$, H10 not upheld).

Table 8: Mediation Analysis Results (Bootstrapping: 5,000 resamples)

Hyp.	Indirect Path	β	Std. Dev.	t-value	p-value	Decision
H8	QSC → EMO → EP	0.101	0.023	4.402	0.000***	Supported (Mediation)
H9	TQM → EMO → EP	0.043	0.014	2.922	0.000***	Supported (Mediation)
H10	EEO → EMO → EP	0.061	0.017	1.411	0.059	Not Supported

Source: Author's own calculations

Model Fit: R² and Effect Sizes

Table 9 presents the R² values and effect sizes (f²). The R² value for EMO was 0.364 (indicating 36.4% variance explained), while for EP it was 0.403 (representing 40.3% variance explained), both demonstrating moderate explanatory capability. EMO showed the most significant impact on EP (f² = 0.174), validating its key mediating function in the model.

Table 9: R² Values and Effect Sizes (f²)

Construct	R ²	R ² Interpretation	f ² on EMO	f ² on EP
EMO	0.364	Moderate	–	0.174
EP	0.403	Moderate	–	–
QSC	–	–	0.040	0.010
TQM	–	–	0.090	0.132
EEO	–	–	0.052	0.087

Source: Author's own calculations

Summary of Hypotheses Testing

Table 10 provides a consolidated summary of all hypothesis test outcomes.

Table 10: Summary of Hypotheses Testing

Hypothesis	Statement	Outcome
H1	QSC $\rightarrow$ EP (direct)	Not Supported
H2	TQM $\rightarrow$ EP (direct)	Supported ***
H3	EEO $\rightarrow$ EP (direct)	Not Supported
H4	QSC $\rightarrow$ EMO	Supported ***
H5	TQM $\rightarrow$ EMO	Supported ***
H6	EEO $\rightarrow$ EMO	Not Supported
H7	EMO $\rightarrow$ EP	Supported ***
H8	QSC $\rightarrow$ EMO $\rightarrow$ EP (mediation)	Supported ***
H9	TQM $\rightarrow$ EMO $\rightarrow$ EP (mediation)	Supported ***
H10	EEO $\rightarrow$ EMO $\rightarrow$ EP (mediation)	Not Supported

Source: Author's own calculations

Discussion

TQM and Export Performance

The notable positive influence of TQM on EP (H2 affirmed; $\beta = 0.168$, $p < 0.01$) is consistent with a strong body of research (Kaynak, 2003; Abeykoon and de Alwis, 2016; Lages et al., 2009). Companies that consistently apply grading, sorting, hygiene management, and ongoing process enhancement exhibit superior product quality and increased consistency, which directly meets the expectations of international buyers, especially in Gulf and Southeast Asian regions. In the RBV framework, TQM is seen as a unique, valuable, and hard-to-replicate internal resource that produces long-term competitive advantage in export markets.

QSC and Export Performance

The direct effect of QSC on EP is not significant (H1 not supported; $\beta = 0.135$, $p = 0.079$), which is subtle yet aligns with theoretical perspectives. Numerous firms seem to perceive quality certification as a compliance obligation for entering the market instead of a strategic advantage. Exporters utilizing indirect export channels might meet basic phytosanitary standards without thoroughly incorporating quality principles into their value propositions. This is consistent with Miesenbock (1988), who claimed that successful exporting relies more on market responsiveness than merely on compliance. Quality compliance establishes essential yet insufficient conditions for export success; it needs to be directed through a market-focused strategy.

EEO and Export Performance

The insignificant direct effect of EEO on EP (H3 unsupported; $\beta = 0.182$, $p = 0.090$) mirrors the structural conditions present in Pakistan's citrus sector. While innovativeness, risk-taking, and proactiveness are theoretically associated with better export results, their effectiveness is hin-

dered by a lack of product innovation (especially the lack of commercially viable seedless Kinnow varieties), insufficient access to global networks, and insufficient cold chain infrastructure development. This backs up Slater and Narver (2000), who discovered that entrepreneurial traits need backing organizational abilities to achieve performance advantages.

Mediating Role of EMO

The key mediation of EMO in the QSC–EP (H8; $\beta = 0.101$, $p < 0.01$) and TQM–EP (H9; $\beta = 0.043$, $p < 0.01$) pathways represents the primary innovative contribution of this research. These results empirically illustrate that the quality of internal capabilities, compliance, and TQM lead to improvements in export performance mainly via enhanced market orientation. Companies that adhere to quality standards and apply TQM practices cultivate organizational abilities to more effectively comprehend and address the needs of international buyers. This mediating route aligns with Dynamic Capability Theory: sensing (grasping global quality standards), seizing (acquiring certifications and executing TQM), and transforming (adjusting via EMO) constitute a dynamic capability pathway linking quality investments to export results. The lack of EMO mediation for EEO (H10 not supported) indicates that entrepreneurial orientation by itself is inadequate without organized market information systems.

Conclusions and Policy Recommendations

Conclusions

This research offers the inaugural extensive multi-variable empirical analysis of the relationship between quality standards and export performance in Pakistan's Kinnow export sector. Out of ten proposed hypotheses, six were validated. TQM and EMO are the strongest influences on export performance. QSC and EEO impact performance mainly via the mediating route of EMO, a significant discovery that disputes the common belief that adherence to quality standards is the sole factor behind export success. Investments in internal quality need to be strategically directed through market-focused actions to achieve significant performance enhancements.

The research highlights the twofold character of Pakistan's citrus export environment: one group of market-focused, quality-driven companies entering mid-to-high-end markets, and a broader group of compliance-lax, intermediary-reliant businesses limited to low-value informal trading pathways. Closing this divide is the main policy issue facing the industry.

Policy Recommendations

Given the primary challenges identified in the research, such as inadequate compliance with quality standards, unreliable cold chain infrastructure, limited diversification in export markets, insufficient entrepreneurial innovation, lack of market orientation, and difficulties in adhering to stringent standards, the following recommendations are suggested to improve Pakistan's citrus export industry:

- 1) Citrus exporters should implement a strategic methodology for complying with quality standards. Rather than viewing standards as mere requirements for export eligibility, firms ought to weave them into their long-term competitiveness strategies. This involves consistently adhering to food safety protocols, ensuring traceability through proper documentation, and striving for

higher-level certifications such as Global GAP and HACCP, especially for access to premium markets.

2) Exporters need to embed total quality management practices at every operational level. The study highlights a strong correlation between total quality management and export performance. As a result, systematic processes for grading, cleaning, sorting, packaging, and hygiene monitoring should be incorporated into daily operations in citrus processing facilities.

3) Investment in export market orientation is crucial. Firms must grasp the tastes, preferences, and packaging requirements of a variety of markets. Focusing solely on traditional markets poses a risk. Cultivating export market orientation involves conducting regular market analysis, creating feedback systems from buyers, and adapting to shifting demands.

4) Product innovation is vital for fostering an entrepreneurial orientation. The findings indicate a weak relationship between entrepreneurial orientation and performance. Firms should consider diversifying into seedless Kinnow varieties, introducing new packaging designs, and exploring organic or eco-certified options to fulfill niche market demand in Western and East Asian regions.

5) There is a pressing need to enhance cold chain infrastructure. Exporters have reported ongoing losses due to inadequate temperature-controlled transport. Collaborations between public and private sectors can facilitate the establishment of refrigerated logistics and packing facilities across citrus-producing regions.

6) Relying on a limited number of export destinations exposes the industry to risks. Expanding into new areas such as Southeast Asia, Africa, and Central Europe can help mitigate this vulnerability. Achieving this will require support through trade missions, embassies, and marketing initiatives to promote Kinnow in these markets.

7) The government should simplify the certification support programs. By subsidizing international certification costs and providing training on documentation and auditing, small and medium-sized exporters will be better positioned to access high-end markets and minimize shipment rejections.

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