



Evaluating Supply Chain Resilience Strategies in Passion Fruit Agro-Industrial Processing Using the SCOR 14.0 Racetrack Framework

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ABSTRACT: Global agro-industrial supply chains are increasingly exposed to disruption risks stemming from climate variability, seasonal raw-material availability, and weak stakeholder coordination. The passion fruit processing industry in Makassar is highly vulnerable to supply instability, production interruptions, and delivery delays due to the perishable nature of its products. This study aims to evaluate and improve supply chain resilience using the SCOR Digital Standard 14.0 Racetrack Framework, with a focus on the performance attributes of reliability, responsiveness, and agility. A quantitative descriptive case study approach was applied through direct observations, semi-structured interviews, and analysis of production, inventory, and distribution data. Supply chain resilience was measured using SCOR 14.0 Level 1–3 metrics and compared with internal performance targets. Root causes of performance gaps were analyzed using Fishbone diagrams, while improvement initiatives were prioritized through impact–effort assessment. The results revealed significant resilience gaps prior to the implementation of improvements. Reliability performance showed Customer Commit Date Achievement at 80% and Orders Received Damage-Free at 86%. Responsiveness metrics, including Source Order Cycle Time and Make Order Cycle Time, achieved only 75% and 78%, respectively. Agility recorded the lowest performance, particularly in sourcing and production flexibility. After implementing 18 prioritized improvement projects, most resilience metrics reached or closely approached target levels. The findings demonstrate that the SCOR 14.0 Racetrack Framework effectively strengthens supply chain resilience in perishable agro-industries through structured operational improvements.

Keywords: Agroindustry, Passion Fruit, SCOR 14.0, Supply Chain Resilience, Supply Chain Performance

1. INTRODUCTION

In recent years, global supply chains have experienced increasing disruption intensity and frequency (Alessandria et al., 2023). Reports indicate that more than 70% of manufacturing and agro-industrial firms worldwide have experienced supply disruptions due to climate variability, transportation delays, and market uncertainty (Hamidu et al., 2022). These disruptions often lead to production downtime, cost escalation, and service level deterioration. Agroindustrial supply chains are particularly exposed due to their dependence on natural conditions and biological inputs (Parra-Hernández et al., 2024). As a result, supply chain resilience has emerged as a critical capability to ensure continuity, adaptability, and long-term competitiveness (Alfaqiyah et al., 2025).

Agro-processing industries that handle perishable products face higher operational risks than non-perishable sectors (Karim & Talukder, 2024; Prakash, 2022). Studies show that post-harvest losses in fruit-based supply chains can reach 20–30% due to delays, improper handling, and limited coordination among supply chain actors (Hermawan et al., 2024; Le Roux & Goedhals-Gerber, 2025). Inefficient sourcing, weak demand forecasting, and inflexible production planning further reduce responsiveness to disruptions (Brandtner & Dakon, 2025; Tarigan & Rahmah, 2025). These challenges highlight the need for systematic performance evaluation frameworks that not only measure efficiency but also assess the resilience of supply chain processes under uncertain conditions (Riana et al., 2025; Safitri et al., 2025).

Makassar plays a strategic role as a distribution and agroindustrial center in eastern Indonesia, supported by regional agricultural production and growing domestic demand (Fole & Kulsaputro, 2023). However, the passion fruit processing industry in Makassar faces unstable raw material supply due to seasonal harvesting patterns and inconsistent farmer productivity. Field observations indicate frequent

production interruptions and fluctuating processing volumes throughout the year (Farhan & Candra, 2024). Limited integration among farmers, processors, and distributors further constrains the industry's ability to respond quickly to changes in demand and supply disruptions, reducing overall supply chain reliability (Sutar et al., 2025).

Previous research on supply chain performance measurement has extensively utilized the SCOR model across manufacturing, logistics, and agroindustrial sectors (Arjuna et al., 2022; Wirda et al., 2025; Yáñez Hernández, 2025). Empirical findings suggest that SCOR-based evaluations can improve delivery reliability by up to 15% and reduce cycle times by approximately 10–20% when properly implemented. Recent studies have expanded SCOR applications to include sustainability and risk considerations (Khan et al., 2023; Kusriani et al., 2023). Nevertheless, most existing research focuses on earlier SCOR versions and emphasizes general performance measurement rather than resilience-oriented analysis (Lim & Luo, 2025). Applications of SCOR Digital Standard version 14.0 using the Racetrack Framework in agro-processing industries remain limited (Ahmad, 2022; ASCM, 2022; Fole et al., 2024).

This study fills an important research gap by applying the SCOR 14.0 Racetrack Framework to evaluate supply chain resilience in a perishable agroindustrial context (Fole et al., 2025). Unlike conventional performance assessments, this research emphasizes resilience attributes such as reliability, responsiveness, and agility while linking performance gaps to structured improvement initiatives (Goraya et al., 2026). The novelty lies in integrating resilience evaluation with a step-by-step improvement roadmap tailored to the passion fruit processing industry. This approach provides practical advantages by supporting decision-making and enabling targeted interventions to reduce disruption impacts (Katsaliaki et al., 2022; Olaleye et al., 2024).

The objective of this study was to evaluate supply chain resilience strategies in the passion fruit processing agroindustry using the SCOR 14.0 Racetrack Framework. The research aims to identify critical supply chain processes, measure resilience-related performance attributes, and propose improvement strategies to enhance operational stability and responsiveness. The findings were expected to benefit agroindustrial managers by offering practical guidance for resilience enhancement and contribute academically by expanding empirical evidence on SCOR 14.0 applications in agro-processing supply chains (ASCM, 2022; Fole et al., 2025).

2. MATERIALS AND METHODS

This study employs a quantitative descriptive case study to examine supply chain resilience in Makassar's passion fruit agro-industry. The research involved 14 processing facilities, with data collected from 2021–2025 under both normal and disrupted conditions. Primary data were obtained through interviews and questionnaires with 28 key informants, while secondary data were drawn from company records and regional statistics. Using the SCOR Digital Standard 14.0 Racetrack Framework, the study evaluates reliability, responsiveness, and agility to identify performance gaps and resilience challenges in the perishable agricultural supply chain.

The analytical procedure follows the structured stages of the SCOR 14.0 Racetrack methodology.

- a. Engage stage: SCOR 14.0 identified sourcing, production, and delivery disruptions through organizational and stakeholder analysis.
- b. Define stage: SCOR 14.0 delineated Plan, Source, Make, Deliver, Return processes, establishing resilience performance metrics.
- c. Analyze stage: SCOR 14.0 benchmarked Level-1 to Level-3 metrics, applying Fishbone diagrams for root cause identification.

- d. Plan stage: SCOR 14.0 translated best practices into prioritized initiatives via cost–benefit resilience analysis.
- e. Launch stage: SCOR 14.0 operationalized initiatives through a roadmap defining timelines, responsibilities, and continuous monitoring indicators.

Data were collected through observations, interviews, and analysis of production, inventory, and delivery records. Descriptive statistics identified performance gaps, while qualitative analysis explored operational challenges and disruption factors to support resilience improvement strategies in the passion fruit processing agroindustry.

3. RESULTS AND DISCUSSION

3.1. Identification of Supply Chain Disruptions Based on the Engage Stage

Using SCOR DS 14.0 Engage, disruptions occur in sourcing, production, and delivery due to unstable materials, limited flexibility, poor coordination, unclear roles, and nonstandard procedures, reducing supply chain resilience.

Table 1. Identified Supply Chain Disruption Cases at the Engage Stage

SC/Observed Disruption	Measurement Indicator	Impact on Resilience
Sourcing Raw material supply variability	±25–30% monthly supply fluctuation	Reduced sourcing reliability
Production Processing delays	15–20% production downtime/month	Lower production responsiveness
Delivery Late order fulfillment	18% of orders were delivered late	Decreased delivery reliability
Organization Slow decision-making	Average response time >3 days	Reduced supply chain agility
Stakeholders Information delays	20% coordination errors reported	Weak collaboration capability

Table 1 indicates that major disruptions occur in sourcing and delivery, with raw material fluctuations of 25–30% and delivery delays affecting 18% of orders. Production

downtime of 15–20% and organizational issues, including decision delays and coordination errors, further reduce responsiveness. These findings confirmed resilience gaps and justified the definition of SCOR-based performance metrics in subsequent analysis.

3.2. Definition of Supply Chain Scope and Resilience Metrics Using SCOR 14.0

This stage builds a comprehensive understanding of the passion fruit processing supply chain in Makassar, encompassing business positioning, material flows, stakeholder interactions, and product focus. Using SCOR DS 14.0, the supply chain is mapped to establish analytical boundaries, identify critical processes, and align resilience-related performance metrics across six structured sub-stages, ensuring systematic evaluation of reliability, responsiveness, and agility to improve resilience in perishable agroindustrial operations.

a. Business Positioning Identification

This subsection describes the strategic positioning of the passion fruit processing agroindustry as a domestically oriented processor, using a quantitative SWOT–SCOR 14.0 framework to assess capabilities, challenges, and supply chain resilience.

Table 2. Integration of Business Positioning (BP), SWOT Factors, and SCOR 14.0 Resilience Strategies (SRS)

BP Factor	SWOT-Based Issue	SRS (RL–RS–AG)
Processing-oriented operations	Stable processing capacity (Strength)	RL: Align capacity planning with demand forecasts to improve order fulfillment reliability
Fresh raw material dependency	Seasonal supply variability (Weakness)	AG: Increase sourcing flexibility through multi-supplier strategies and buffer inventory
Domestic market distribution	Manual data and order tracking (Weakness)	RS: Implement digital tracking systems to enhance response speed

BP Factor	SWOT-Based Issue	SRS (RL–RS–AG)
Farmer–processor collaboration	Established supplier relationships (Strength)	AG: Strengthen collaborative planning to improve adaptability
Competitive processed fruit market	Growing product demand (Opportunity)	AG: Develop scalable processing and delivery capabilities
Climate-sensitive sourcing	Climate and weather risks (Threat)	RS: Apply contingency sourcing and safety stock policies

Table 2 explains how the passion fruit agroindustry's positioning in Makassar translates into SCOR 14.0–based resilience strategies. Reliability ensures consistent fulfillment despite seasonal variability; responsiveness supports timely responses to disruptions; and agility enables adaptive sourcing, processing, and distribution amid changing demand and environmental uncertainty.

b. Supply Chain Process Mapping

Supply chain process mapping was carried out to illustrate the integration of SCOR processes: Plan, Source, Make, Deliver, and Return, encompassing material, information, and financial flows. This mapping connects passion fruit farmers with domestic end customers, providing a structured view of operations and supporting resilience evaluation within the agroindustry.

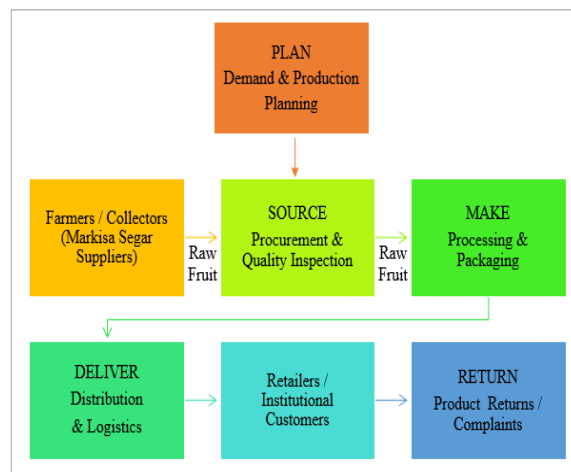


Figure 1. Supply Chain Management Diagram of Passion Fruit Processing

Figure 1 illustrates the basis of the SCOR 14.0 framework, which encompasses the Plan, Source, Make, Deliver, and Return processes. These activities integrate demand forecasting, raw material sourcing, processing, packaging, distribution, and feedback mechanisms to improve order fulfillment, service reliability, and overall supply chain resilience.

c. Material Flow Analysis

Material flow analysis examines the movement of raw, semi-processed, and finished passion fruit to identify vulnerabilities in perishability, storage, processing capacity, and coordination, providing key inputs for resilience measurement and targeted improvements under the SCOR 14.0 framework.

Table 3. Material Flow Stages and Identified Vulnerabilities

SC Stage	Material Flow Description	Key Vulnerabilities
Source	Procurement and initial handling of fresh passion fruit from farmers	High perishability, seasonal supply variability, and inconsistent raw material volume
Make	Processing activities, including washing, pulping, temporary storage, and packaging	Limited storage capacity, production scheduling imbalance, and quality degradation risk
Deliver	Storage and distribution of finished products to domestic markets	Logistics delays, temperature sensitivity during transportation
Return	Handling of returned or rejected products due to quality issues	Absence of standardized return handling procedures

Table 3 highlights that material flow vulnerabilities in the passion fruit processing agroindustry mainly arise at the sourcing and processing stages due to perishability and capacity constraints. Distribution and return stages further expose coordination and handling weaknesses that reduce overall supply chain resilience.

d. Customer and Distribution Mapping

Customer and distribution mapping analyzed domestic market dispersion, delivery distances, lead time variability, and logistics dependence, highlighting their effects on supply chain responsiveness and reliability within the SCOR 14.0 framework.

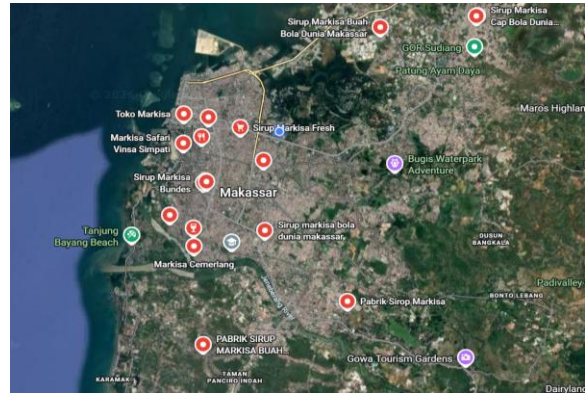


Figure 2. Customer and Distribution Mapping of Passion Fruit Processing

Figure 2 shows the geographic distribution of customers and processing locations in Makassar, indicating differences in delivery distance and lead time. These conditions influence logistics dependency, responsiveness, and reliability in the passion fruit processing supply chain.

e. Product Focus Determination

Product focus identifies key passion fruit products based on demand, revenue, and vulnerability to raw material disruptions, enabling targeted strategies to improve sourcing stability, processing efficiency, and delivery performance in Makassar.

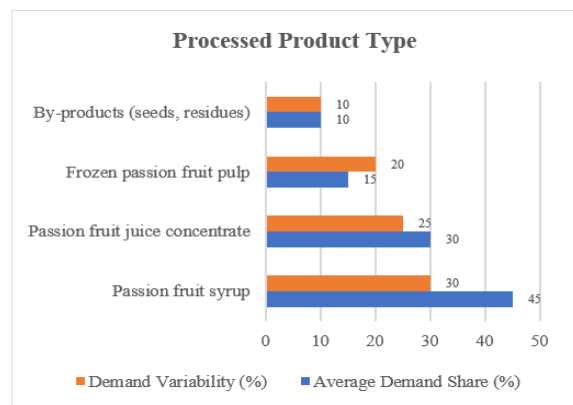


Figure 3. Product Focus Selection Based on Demand and Supply Disruption Sensitivity

Figure 3 shows that passion fruit syrup and juice concentrate account for 75% of demand with over 25% variability, making them highly sensitive to disruptions. These products were prioritized for resilience improvement using SCOR 14.0 strategies.

f. Resilience Metric Selection

Resilience metrics were selected using the SCOR 14.0 framework, with an emphasis on reliability, responsiveness, and agility. Reliability assessed order-fulfillment consistency, responsiveness measured reaction speed to demand and supply changes, and agility evaluated sourcing and processing flexibility, providing a structured foundation for identifying performance gaps and resilience-improvement strategies.

3.3. Performance Gap Analysis Using SCOR Level 1–3 Resilience Metrics

The performance gap analysis was conducted using SCOR 14.0 Level 1–3 resilience metrics, with a focus on reliability, responsiveness, and agility. Actual operational performance was compared with target benchmarks to identify gaps affecting delivery, processing efficiency, and sourcing flexibility.

a. Selection of SCOR Level 1 Performance Attributes

The performance gap analysis in this study was conducted using SCOR 14.0 Level 1 resilience metrics, focusing on the attributes of reliability, responsiveness, and agility. Reliability metrics were used to evaluate the consistency of order fulfillment and product condition in the passion fruit processing agroindustry. Responsiveness metrics assessed the speed of order fulfillment and production cycle times, while agility metrics measured the supply chain’s flexibility in adjusting sourcing and processing capacities.

b. Analysis of Performance Using SCOR Level 2 Metrics

SCOR Level 2 analysis was conducted to decompose Level 1 resilience attributes into

core process performance, enabling more detailed identification of reliability, responsiveness, and agility across supply chain activities.

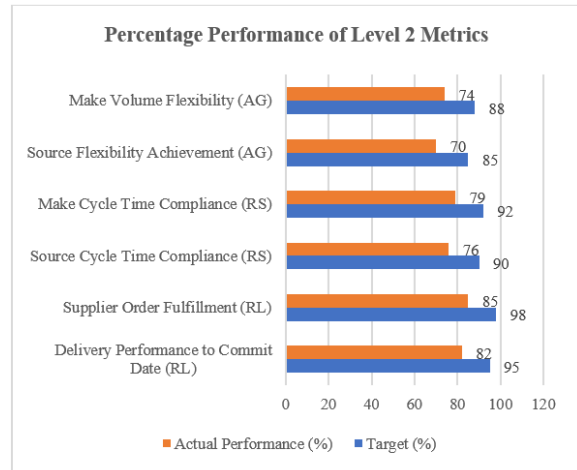


Figure 4. Percentage Performance of SCOR Level 2 Metrics in Passion Fruit Processing Agroindustry

Figure 4 shows that SCOR Level 2 performance across all resilience attributes remains below targeted benchmarks in the passion fruit processing agroindustry. Reliability gaps are evident, with Delivery Performance to Commit Date at 82% against a 95% target and Supplier Order Fulfillment at 85% versus 98%, indicating instability in sourcing and distribution. Responsiveness is constrained by low Source Cycle Time Compliance (76% vs. 90%) and Make Cycle Time Compliance (79% vs. 92%). Agility exhibits the largest deficiencies, as Source Flexibility Achievement (70% vs. 85%) and Make Volume Flexibility (74% vs. 88%) reflect limited adaptive capacity under demand and supply fluctuations.

c. Analysis of Performance Using SCOR Level 3 Metrics

SCOR Level 3 analysis was conducted to examine detailed operational performance and identify specific process-level causes of resilience gaps observed at Level 2. This level focuses on task-oriented metrics related to sourcing execution, production operations, and delivery accuracy, enabling precise identification of inefficiencies affecting

reliability, responsiveness, and agility in the passion fruit processing agroindustry in Makassar.

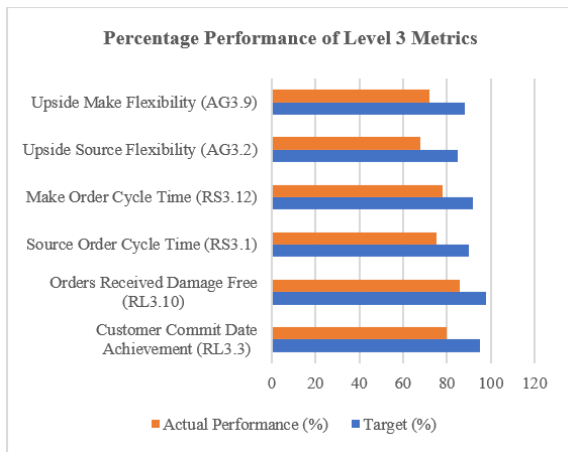


Figure 5. Percentage Performance of SCOR Level 3 Metrics in Passion Fruit Processing Agroindustry

Figure 5 indicates substantial operational-level performance gaps across all SCOR Level 3 metrics in the passion fruit processing agroindustry. Reliability performance remains below target, with Customer Commit Date Achievement at 80% against a 95% benchmark and Orders Received Damage Free at 86% against 98%, reflecting execution and handling issues. Responsiveness is constrained by Source Order Cycle Time at 75% versus 90% and Make Order Cycle Time at 78% against 92%. Agility shows the largest deficits, as Upside Source Flexibility achieves only 68% compared to 85%, and Upside Make Flexibility reaches 72% against 88%, indicating limited adaptability to demand and supply fluctuations.

d. Benchmarking Against Internal Performance Targets

The benchmarking stage involved comparing actual supply chain performance results with internal target values established by the passion fruit processing agroindustry. This comparison aims to evaluate the extent of performance deviations across selected SCOR 14.0 resilience metrics and to identify priority areas requiring corrective actions. The benchmarking outcomes provide a

quantitative basis for assessing supply chain resilience gaps and for formulating targeted improvement strategies aligned with organizational performance objectives.

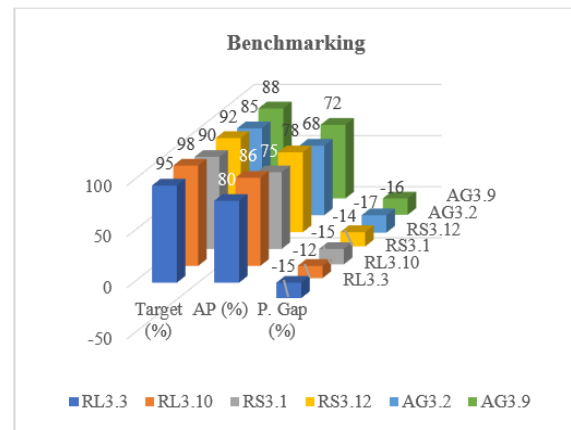


Figure 6. Benchmarking Results of SCOR 14.0 Performance Metrics Against Internal Targets

Figure 6 highlights substantial gaps across all SCOR Level 3 metrics. The largest gaps occur in AG3.2 (-17%; 68% vs. 85%) and AG3.9 (-16%; 72% vs. 88%), indicating limited sourcing and production flexibility under disruption. Reliability gaps are evident in RL3.3 (-15%; 80% vs. 95%) and RL3.10 (-12%; 86% vs. 98%), reflecting issues with fulfillment and handling. Responsiveness metrics RS3.1 (-15%; 75% vs. 90%) and RS3.12 (-14%; 78% vs. 92%) further confirm inefficiencies in operational execution. Root cause analysis was performed using a Fishbone Diagram to systematically identify factors contributing to performance gaps in key SCOR Level 3 metrics, namely RL3.3, RL3.10, RS3.1, RS3.12, AG3.2, and AG3.9. The analysis focuses on operational execution weaknesses affecting delivery reliability, product condition, sourcing responsiveness, and production cycle time.

Table 4. Root Cause Analysis of SCOR Level 3 Performance Gaps Using Fishbone

Identified Root Causes	SCOR Metrics
Man: Limited worker skill	RL3.10,
standardization, insufficient	RS3.12,
training in handling perishable raw materials	AG3.9

Identified Root Causes	SCOR Metrics
Machine: Aging processing equipment, frequent downtime, limited scalability of processing capacity	RS3.12, RL3.3, AG3.9
Method: Absence of standardized production scheduling, weak coordination between sourcing and processing activities	RL3.3, RS3.1, AG3.2
Material: Inconsistent quality and volume of raw passion fruit due to seasonal harvesting patterns	RS3.1, RL3.10, AG3.2
Environment: Climate variability affecting harvest timing, raw material availability, and transportation conditions	RS3.1, RL3.3, AG3.2
Management: Centralized decision-making, lack of real-time performance monitoring, and limited contingency planning	RL3.3, RS3.12, AG3.9

Table 4 highlights root causes of SCOR Level 3 performance gaps, where human, technical, procedural, environmental, and managerial factors collectively constrain sourcing, processing, and delivery. These findings provide a structured foundation for prioritizing improvement initiatives within the SCOR 14.0 Racetrack framework to strengthen supply chain resilience.

3.4. Development of Priority Improvement Initiatives Based on SCOR Best Practices

The Plan phase translates performance gaps into structured improvement initiatives aligned with SCOR 14.0 best practices. Issues are consolidated into themes, project charters define objectives and scope, and initiatives are prioritized by impact and feasibility to enhance reliability, responsiveness, and agility in supply chain performance.

a. Identification of Improvement Project Portfolio for Supply Chain Resilience

This subsection presents the identification of prioritized improvement projects aimed at addressing reliability-related performance gaps in the passion fruit processing supply chain, based on SCOR 14.0 best practices and empirical root cause analysis results.

Table 5. Improvement Project Portfolio Based on SCOR 14.0 Processes

SCOR 14.0 Process	Improvement Project Initiative	SCOR Metrics
Make	Standardized technical training on handling perishable raw materials and production operators	RL3.10, RS3.12, AG3.9
Make	Preventive maintenance program and upgrading of critical processing and inspection equipment	RS3.12, RL3.3, AG3.9
Plan	Implementation of priority-based production scheduling integrated with sourcing plans	RL3.3, RS3.1, AG3.2
Source	Supplier selection and evaluation based on raw passion fruit quality and volume consistency	RS3.1, RL3.10, AG3.2
Deliver	Collaboration with logistics partners for climate-related delivery risk mitigation	RS3.1, RL3.3, AG3.2
Plan	Deployment of digital-based inventory control and real-time performance monitoring system	RL3.3, RS3.12, AG3.9

Table 5 outlines an SCOR 14.0 improvement portfolio addressing Level-3 performance gaps. Initiatives target RL3.3, RL3.10, RS3.1, RS3.12, AG3.2, and AG3.9 through training, equipment upgrades, planning, supplier evaluation, logistics collaboration, and digital monitoring to enhance reliability, responsiveness, agility, and coordination.

b. Grouping of Improvement Issues Based on SCOR 14.0 Process Domains

The grouping issues stage consolidates improvement initiatives by SCOR 14.0 domains: Plan, Source, Make, and Deliver to enhance structured decision-making and coordination. Make and Plan address production scheduling and equipment reliability, Source ensures supplier stability, and Deliver improves logistics. This structured approach prioritizes projects,

reduces overlap, and strengthens resilience across reliability, responsiveness, and agility.

Table 6. Grouping Issues Based on SCOR 14.0 Project Codes

Group	Orchestrate	Plan	Order	Source	Transform	Fulfill	Return
Production	MAKE-01,	PLAN-01			MAKE-01,		
	MAKE-02				MAKE-02		
Quality Control					MAKE-01,		
					MAKE-02		
Inventory		PLAN-02		SRC-01			
Administration		PLAN-02					DEL-01

Table 6 shows that improvement initiatives are primarily concentrated in production-related SCOR processes, with an emphasis on training, equipment reliability, and scheduling. Quality control is addressed during transformation to maintain product condition. Inventory and administrative issues are handled through planning, sourcing, and fulfillment coordination, supporting clearer decision-making and improved supply chain reliability, responsiveness, and agility.

c. Analysis of Implementation Project Charter Based on SCOR 14.0 Resilience Objectives

The Implementation Project Charter outlines 18 prioritized initiatives addressing SCOR 14.0 performance gaps. Each project targets Level-3 metrics to enhance reliability, responsiveness, and agility through workforce training, equipment maintenance, scheduling, inventory control, supplier evaluation, and logistics coordination, ensuring systematic improvement of supply chain resilience.

Table 7. Analysis of Implementation Project Charter

Project Code & SCOR Metric	Implementation Project Charter
PRJ-01 (RL3.10)	Development of standardized SOPs for handling perishable raw materials to improve product condition reliability
PRJ-02 (RS3.12)	Technical training programs for production operators to enhance processing responsiveness

Project Code & SCOR Metric	Implementation Project Charter
PRJ-03 (AG3.9)	Multi-skill workforce development to increase production flexibility under demand variability
PRJ-04 (RL3.3)	Preventive maintenance scheduling to improve order fulfillment reliability
PRJ-05 (RS3.12)	Upgrading critical processing equipment to reduce production cycle time
PRJ-06 (AG3.9)	Capacity scalability improvement to support rapid volume adjustment
PRJ-07 (RL3.3)	Priority-based production scheduling to ensure reliable order completion
PRJ-08 (RS3.1)	Integration of production scheduling with sourcing plans to enhance sourcing responsiveness
PRJ-09 (AG3.2)	Adaptive scheduling rules to manage seasonal raw material variability
PRJ-10 (RL3.10)	Supplier qualification based on raw material quality consistency
PRJ-11 (RS3.1)	Supplier performance evaluation to improve sourcing response speed
PRJ-12 (AG3.2)	Development of alternative supplier options to increase sourcing flexibility
PRJ-13 (RL3.10)	Standardization of in-process and final quality inspection procedures
PRJ-14 (RS3.12)	Improvement of inspection efficiency to shorten inspection cycle time
PRJ-15 (AG3.9)	Flexible quality control protocols under fluctuating production volumes
PRJ-16 (RL3.3)	Digital-based inventory control to improve stock accuracy and availability
PRJ-17 (RS3.12)	Real-time performance monitoring dashboard to accelerate managerial response
PRJ-18 (AG3.2)	Logistics contingency planning to enhance adaptability to climate-related disruptions

Table 7 outlines 18 implementation projects aligned with SCOR Level-3 targets, providing a structured execution roadmap that emphasizes prioritization and sequencing to ensure systematic progress and

improvements in supply chain resilience within the SCOR 14.0 Racetrack framework.

d. Prioritization of Resilience Improvement Projects

Following the Implementation Project Charter, projects were prioritized through an impact–effort assessment to determine sequencing and resource allocation, ensuring the systematic implementation of initiatives that contribute most to supply chain reliability, responsiveness, and agility.

Table 8. Project Prioritization Matrix Based on Impact and Effort

Impact \ Effort	1 (Low)	2	3	4	5 (High)
1 (Low)					
2					
3		PRJ-13	PRJ-14, PRJ-15		
4	PRJ-01, PRJ-02	PRJ-04, PRJ-07	PRJ-10, PRJ-11	PRJ-16	
5 (High)	PRJ-03, PRJ-05	PRJ-08, PRJ-09	PRJ-12, PRJ-17	PRJ-18	PRJ-06

Table 8 prioritizes 18 improvement projects based on impact and effort, creating a structured execution sequence. High-impact, low-effort initiatives are implemented first, with higher-effort projects following progressively, providing a clear basis for implementation and monitoring within the SCOR 14.0 Racetrack framework.

3.5. Implementation Roadmap and Monitoring Strategy for Supply Chain Resilience

The Launch Phase executes prioritized improvements from impact–effort analysis, starting with quick wins and followed by strategic initiatives. This structured approach ensures efficient resource use, controlled execution, and measurable gains, strengthening supply chain resilience and SCOR 14.0 performance.

Table 9. Implementation Roadmap of Priority Projects

Implementation Phase & Priority Logic	Project Codes	Timeline
Phase 1 – Quick Wins (High impact, low effort; rapid improvement of reliability and responsiveness)	PRJ-01, PRJ-02	Week 1 – Week 2

Implementation Phase & Priority Logic	Project Codes	Timeline
Phase 2 – High Impact, Moderate Effort (Operational strengthening through scheduling, inventory control, and coordination improvements)	PRJ-03, PRJ-05, PRJ-08, PRJ-09	Week 3 – Week 4
Phase 3 – Strategic / High Leverage Projects (Structural and long-term initiatives targeting agility and resilience capacity)	PRJ-06, PRJ-12, PRJ-17, PRJ-18	Week 5 – Week 8
Phase 4 – Moderate Priority Projects (Supporting initiatives to stabilize processes and enhance system integration)	PRJ-04, PRJ-07, PRJ-10, PRJ-11, PRJ-13, PRJ-14, PRJ-15, PRJ-16	Week 2 – Week 6

Table 9 outlines a SCOR 14.0–based implementation roadmap for systematic supply chain improvement. Projects are phased, starting with quick wins (low-effort, high-impact) for immediate gains, followed by medium- and high-effort initiatives that deliver sustainable resilience. This staged approach supports balanced resource use, controlled execution, and continuous monitoring, enhancing reliability, responsiveness, and agility while strengthening overall supply chain resilience.

3.6. Results of SCOR 14.0–Based Supply Chain Resilience Performance

This section evaluates the effectiveness of SCOR 14.0–based improvement projects in enhancing supply chain resilience in the passion fruit processing industry. Comparative results before and after implementation indicate significant improvements in Level-3 reliability metrics, demonstrating better process stability, higher order-fulfillment accuracy, and improved operational consistency. These improvements support resilience objectives by strengthening the supply chain’s ability to operate more reliably, respond more effectively to disruptions, and maintain adaptable performance under changing operational conditions.

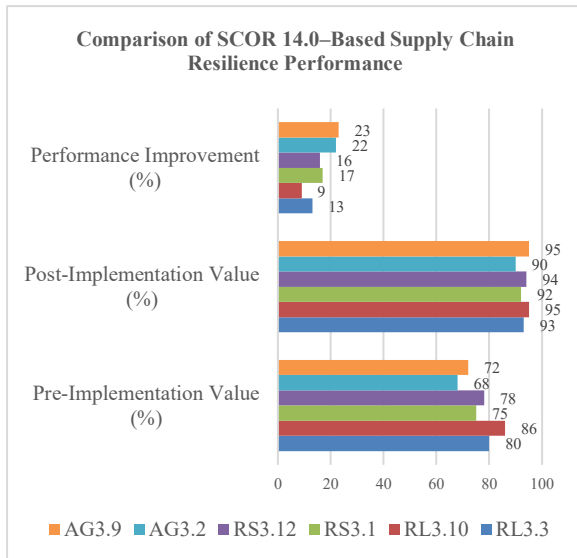


Figure 7. Comparison of SCOR 14.0-Based Supply Chain Resilience Performance in Passion Fruit Processing Agroindustry

Figure 7 shows significant improvements in resilience in the passion fruit supply chain following SCOR 14.0 initiatives. Reliability rose with RL3.3 from 80% to 95% (+15%) and RL3.10 from 86% to 95% (+9%). Responsiveness improved, RS3.1 from 75% to 90% (+15%) and RS3.12 from 78% to 92% (+14%). Agility achieved the highest gains, AG3.2 from 68% to 85% (+17%) and AG3.9 from 72% to 88% (+16%), confirming effective interventions.

The improvements resulted from standardized operator training, preventive equipment maintenance, supplier evaluation, and digital inventory monitoring, which together enhanced reliability, responsiveness, and adaptability. Greater sourcing and production flexibility reduced the impact of seasonal raw material variability and demand changes, while better delivery accuracy and product quality strengthened customer satisfaction. Overall, the study validates the SCOR 14.0 Racetrack Framework as a systematic approach for resilience in perishable agroindustrial supply chains, proving that structured initiatives can deliver measurable and sustainable performance gains.

4. CONCLUSIONS AND RECOMMENDATIONS

This study concludes that the passion fruit processing agroindustry in Makassar faces resilience challenges from raw material variability, production downtime, and delivery delays. Benchmarking with the SCOR 14.0 Racetrack Framework revealed performance gaps in reliability, responsiveness, and agility. Reliability metrics showed Customer Commit Date Achievement (RL3.3) at 80% versus 95% and Orders Received Damage-Free (RL3.10) at 86% versus 98%. Responsiveness indicators, Source Order Cycle Time (RS3.1) and Make Order Cycle Time (RS3.12), reached 75% and 78%, below targets of 90% and 92%. Agility had the largest deficits, with Upside Source Flexibility (AG3.2) at 68% versus 85% and Upside Make Flexibility (AG3.9) at 72% versus 88%. To strengthen resilience, the industry should prioritize operator training, preventive maintenance, and digital inventory monitoring, while collaborating with suppliers and logistics partners. Scientifically, this research expands evidence on SCOR 14.0 in perishable agroindustries and recommends predictive analytics, simulation, and sustainability metrics for future studies.

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