Performance Analysis of the Supply Chain of Small-Scale Robusta Coffee Agroindustry in Jember Regency

Bambang Herry Purnomo[1], Ummu At-Ta'anny[*,2], Bertung Suryadharma[2], and Kissmy Febi Harianti[2]

[1]Department of Agroindustrial Technology Master Program, Faculty of Agricultural Technology, Universitas Jember

[2]Department of Agro-industrial Technology, Faculty of Agricultural Technology Universitas Jember, Jl. Kalimantan no 37, Sumbersari, Jember, 68121, Indonesia.

Email: ummuattaanny@unej.ac.id*

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Abstract

The sustainability of coffee supply chain operations is heavily dependent on effective performance measurement systems that can identify and mitigate operational risks. This study analyzes supply chain performance of robusta coffee production at Banjarsengon Coffee House, Jember Regency, through assessment using the Supply Chain Operation Reference (SCOR) model version 11.0 at Level 1. Data were collected via structured interviews conducted in October–November 2021 with two internal supply chain experts (owner and head of marketing). Three of the eight metrics evaluated based on the four SCOR attributes (reliability, responsiveness, agility, and asset management) received top ratings: order fulfillment time (2.5 days), flexibility (6.2 days), and cash-to-cash cycle time (10 days). The other four metrics were classified as advantage: delivery performance (93%), order fulfillment (96%), order fulfillment cycle time (6 days), and daily inventory (0.31 days). Based on these results, it can be said that small-scale coffee agroindustries operating in resource-constrained contexts can achieve competitive supply chain performance through targeted operational improvements. The findings are applicable to enterprises with similar characteristics, though their generalizability is limited by the single-case design and reliance on expert judgment rather than comprehensive transaction-level records.

Keywords: *jember regency; robusta coffee; SCOR model; small-scale agroindustry; supply chain performance.*

1. INTRODUCTION

Coffee is one of the most important agricultural commodities in the global agro-industrial sector and plays a significant role in supporting the livelihoods of millions of smallholder farmers worldwide (Pancsira, 2022; Escobar-López et al., 2024). The coffee industry contributes substantially to rural economic development, employment, and export revenues in many producing countries. However, in recent years, coffee supply chains have faced increasing challenges related to climate variability, market price volatility, quality consistency, and logistical inefficiencies, particularly in developing regions (Fromm, 2022; Nuraisyah et al., 2025; Samoggia & Fantini, 2023). These challenges highlight the importance of improving supply chain performance to enhance competitiveness and ensure long-term sustainability.

Indonesia is one of the major coffee-producing countries in the world, with East Java recognized as one of its key production regions (Directorate General of Plantations, 2020). Coffee production in East Java has experienced fluctuating yet generally increasing trends, reflecting growing market demand and the expansion of plantation areas. Several districts, including Malang, Jember, Pasuruan, Lumajang, and Banyuwangi, function as central hubs for coffee cultivation and processing activities. In Jember Regency, coffee plantations are widely distributed across multiple sub-districts, indicating strong regional potential for agro-industrial development (Central Bureau of Statistics (BPS), 2021).

Banjarsengon Coffee House is one of the small-scale coffee agro-industries operating in Jember Regency that processes various coffee products, including robusta and arabica using different post-harvest methods. Similar to many small-scale agro-industries, its operations are closely linked to supply

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chain activities involving raw material procurement, production processes, and product distribution to partners and consumers. Effective supply chain management is essential to ensure that these interconnected activities function efficiently and are capable of meeting customer demand in terms of quantity, quality, and delivery tim (Ghosh & Sar, 2022)

A supply chain can be defined as a network of organizations, people, activities, information, and resources involved in moving a product from suppliers to end consumers. In agro-food supply chains, particularly coffee, coordination among actors is often by informal contractual relationships, limited infrastructure, dependence on weather conditions, and variability in raw material quality. These constraints may result in delays, unmet demand, and inconsistent product quality, thereby reducing overall supply chain performance (Desparita et al., 2023; Singh et al., 2023). At Banjarsengon Coffee House Jember, several operational challenges have been identified, including limited transportation capacity, inadequate road infrastructure, reliance on conventional drying methods, and informal agreements with suppliers and partners. These conditions potentially affect supply chain reliability and responsiveness, emphasizing the need for systematic performance evaluation. Measuring supply chain performance is a critical step in identifying inefficiencies and formulating improvement strategies. One of the most widely adopted frameworks for supply chain performance assessment is the Supply Chain Operations Reference (SCOR) model, which integrates process modeling, benchmarking, and performance measurement into a standardized structure.

While the SCOR model has been extensively applied to large-scale supply chains and formal enterprises in developed countries, its application to small-scale agro-industries operating within informal supply networks in developing regions remains understudied. Previous studies on coffee supply chains focus predominantly on arabica production, price volatility, and sustainability certifications (Wahyuni et al., 2021;Baihaqi et al., 2022;Pragmawiguno et al., 2023). However, literature on robusta coffee agro-industries at small scale, particularly in Indonesia's East Java region, is limited. Moreover, the compatibility of formal SCOR frameworks with the informal, relationship-based coordination typical of small-scale operations has not been systematically evaluated. This study addresses this gap by providing a quantitative assessment of supply chain performance at Banjarsengon Coffee House, demonstrating how the SCOR model can be operationalized in resource-constrained settings and identifying context-specific improvement strategies.

The SCOR model evaluates supply chain performance through five core processes (plan, source, make, deliver, and return) and measures performance using standardized attributes such as reliability, responsiveness, agility, cost, and asset management. The applicability of the SCOR model has been demonstrated in various sectors, including agro-food and agricultural supply chains, due to its ability to systematically map supply chain activities and identify performance gaps (Supply Chain Council, 2012; Mulyadi et al., 2025). Therefore, this study aims to analyze the structure and performance of the coffee production supply chain at Banjarsengon Coffee House Jember using the SCOR model version 11.0 at Level 1. The specific objectives of this research are to identify supply chain activities, evaluate supply chain performance based on selected SCOR attributes and metrics, and propose improvement recommendations for performance indicators that have not yet reached optimal levels. The findings of this study carry broader implications for small-scale agro-industries across developing regions. First, it demonstrates the feasibility of applying formal supply chain frameworks to informal, resource-constrained operations which means a critical issues for policy makers and development agencies. Second, it provides quantified baselines for robusta coffee production particulary in Jember. Third, the improvement recommendations offer a practical roadmap for enterprises facing similar constraints (limited transportation, informal supplier networks, conventional processing methods), thereby contributing to agro-industrial competitiveness in Indonesia's coffee sector.

This study focuses specifically on the robusta coffee supply chain at Banjarsengon Coffee House, a small-scale (approximately 10 employees) agro-industry operating in Jember Regency, East Java. The scope is bounded to Level 1 of the SCOR model v11.0, which provides a macro-level

assessment of supply chain processes without detailed sub-process mapping (Level 2-4). While findings directly apply to Banjarsengon Coffee House, generalization to other small-scale coffee enterprises should account for context-specific factors (farm location, technology access, market relationships). The study does not include cost analysis, environmental impact assessment, or market competitiveness benchmarking beyond the SCOR performance framework.

2. MATERIAL AND METHODS

2.1 Materials and tools

The tools employed in this study consisted of Microsoft Excel for quantitative data processing and calculation of supply chain performance metrics, Microsoft Word for documentation and data organization, and a structured interview questionnaire used as the primary data collection instrument. The questionnaire served as a guided tool for conducting in-depth interviews with identified supply chain experts at Banjarsengon Coffee House Jember. The materials used in this study comprised primary and secondary data obtained from the case study enterprise.

2.2 Research methods

The research method consisted of data collection and data analysis methods.

2.2.1 Data Collection Method

Data collection was carried out in two stages namely structured interviews and questionnaire administration. The data collected encompassed the supply chain structure, the product processing sequence from raw material procurement to production and final product delivery, and quantitative performance records necessary for the calculation of SCOR metrics.

The questionnaire was designed as a guided semi-structured instrument comprising questions directly aligned with the eight SCOR Level 1 performance metrics. The questionnaire used four main variables, which is service quality, product quality, and price. For time-based metrics (cash-to-cash cycle time and daily inventory), respondents were asked to provide estimates of accounts receivable periods, accounts payable periods, average inventory levels, and average daily demand based on company operational records.

The questionnaires were completed by two supply chain experts in the Banjarsengon Coffee House, namely the owner and the head of marketing of Banjarsengon Coffee House Jember. These two individuals were selected as respondents on the basis of their comprehensive knowledge of the supply chain flow and their direct operational responsibilities covering procurement, production oversight, customer relations, and distribution management. In the event of discrepancies between the two respondents' estimates, responses were cross-checked and reconciled through a follow-up discussion session to arrive at a consensus value. Where available, respondent estimates were cross-verified against existing company documentation, including delivery records, inventory logs, and production scheduling documents, to minimize reliance on recall-based responses.

2.2.2 Data Analysis Method

The data analysis method used to determine supply chain activities and the performance of the coffee production supply chain is the supply chain operation reference (SCOR) method. The performance of the coffee production supply chain is measured using indicators based on the supply chain operation reference (SCOR) matrix version 11.0 level 1. Supply chain performance is measured by finding the actual values obtained through in-depth interviews. In this study, performance measurement was carried out using a matrix that presents the calculation of supply chain performance indicators. The calculation of each SCOR matrix indicator (Supply Chain Council, 2012) is as follows:

1) Reliability Attribute

a. Delivery Performance

The percentage of orders delivered to consumers on time and in accordance with consumer preferences, expressed as a percentage. Mathematically, it is written as follows:

$$Delivery\ Performance = \frac{Total\ number\ of\ orders\ delivered\ on\ time}{Total\ number\ of\ orders\ delivered} \times 100\% \quad (1)$$

b. Order Fulfillment

The percentage of orders that can be fulfilled without delay and in accordance with customer requests, expressed as a percentage. Order fulfillment is calculated as follows:

$$Order\ Fulfillment = \frac{Total\ orders\ fulfilled\ without\ waiting}{Total\ customer\ demand} \times 100\% \quad (2)$$

2) Responsiveness Attribute

a. Order Fulfillment Lead Time

It is the time that indicates how quickly or slowly an order must be fulfilled by the company to meet consumer desires, expressed in days. Mathematically, it is written as follows:

$$Order\ Fulfillment\ Lead\ Time = Packaging\ time + Shipping\ time \quad (3)$$

b. Order Fulfillment Cycle

The order fulfillment cycle is a cycle that indicates how quickly or slowly a single order is fulfilled by a company, expressed in days. Mathematically, it is written as follows:

$$Order\ Fulfillment\ Cycle = Planning\ time + Sorting\ time + Packaging\ time + Shipping\ time \quad (4)$$

3) Agility Attributes

a. Flexibility

Flexibility is the total time required to respond to unexpected changes, whether in the form of an increase or decrease in order volume, without incurring penalty fees. Mathematically, it is expressed as follows:

$$Flexibility\ (Days) = Search\ cycle + Packing\ cycle + Delivery\ time \quad (5)$$

4) Asset Attributes

a. Cash to Cash Cycle Time

The period required to convert a company's working capital into cash. This means the length of time (in days) from when the company spends capital to purchase raw materials or production materials from suppliers until the company is able to produce inventory and receive payment from customers. This indicator is useful for managing and controlling a company's financial cycle. The formula for this indicator is as follows:

$$\begin{aligned} &Cash\ to\ Cash\ Cycle\ Time = \\ &Average\ number\ of\ days\ required\ to\ convert\ inventory\ into\ sales\ (Days\ Inventory\ Outstanding) + \\ &Average\ number\ of\ days\ for\ sales\ payments\ (Days\ Sales\ Outstanding) - \\ &Average\ number\ of\ days\ required\ for\ the\ company\ to\ pay\ its\ debts \end{aligned} \quad (6)$$

b. Daily Inventory

The amount of inventory needed to meet order requirements, expressed in days. It can be written as follows:

$$Daily\ Inventory = \frac{Average\ daily\ inventory}{Average\ daily\ demand} \quad (7)$$

After measuring the performance value of each selected supply chain indicator in each matrix, the value of each performance is then compared with the foodSCOR card value as its benchmark (Bolstorflf & Rosenbaum, 2004). In this study, the benchmarking used was obtained from a combination of the supply chain council's determination and supply chain performance measurements in the same type of company. According to Kinding et al. (2019), benchmark data consists of three classifications, namely superior, advantage, and parity. Each classification has a different value. The superior value classification means having the highest or very good performance value, the advantage value means

having a medium or fairly good performance value, and the parity value means having a low performance value in terms of supply chain performance effectiveness targets.

2.3 Research Limitations

This research was conducted from October 2021 to November 2021. The research was conducted at Banjarsengon Coffee House, located at Jl. Seriti No. 31, Kebonlor Banjarsengon, Patrang District, Jember Regency.

The two-month intensive data collection period (October–November 2021) coincided with the primary robusta coffee harvest season in Jember Regency, during which supply chain activities were fully operational and performance data were most representative of standard operating conditions. This period was considered sufficient for the purposes of SCOR Level 1 assessment, which focuses on macro-level performance measurement rather than longitudinal trend analysis. It is acknowledged, however, that performance metrics may exhibit seasonal variation outside this window, and this constitutes one of the study's temporal limitations.

The measurement of external performance attributes is conducted through self-assessments by internal experts who understand supply chain operations. This approach evaluates the company's operational capabilities in meeting external performance standards based on internal documentation, delivery track records, and existing fulfillment procedures.

3. RESULTS AND DISCUSSION

3.1 Structure of the Coffee Production Supply Chain at Banjarsengon Coffee House Jember

The description of the supply chain network structure aims to group the roles and functions of members in the supply chain, so as to explain the differences between the actors involved in the chain network. The structure of the coffee production supply chain network at Banjarsengon Coffee House Jember can be seen in Figure 1.

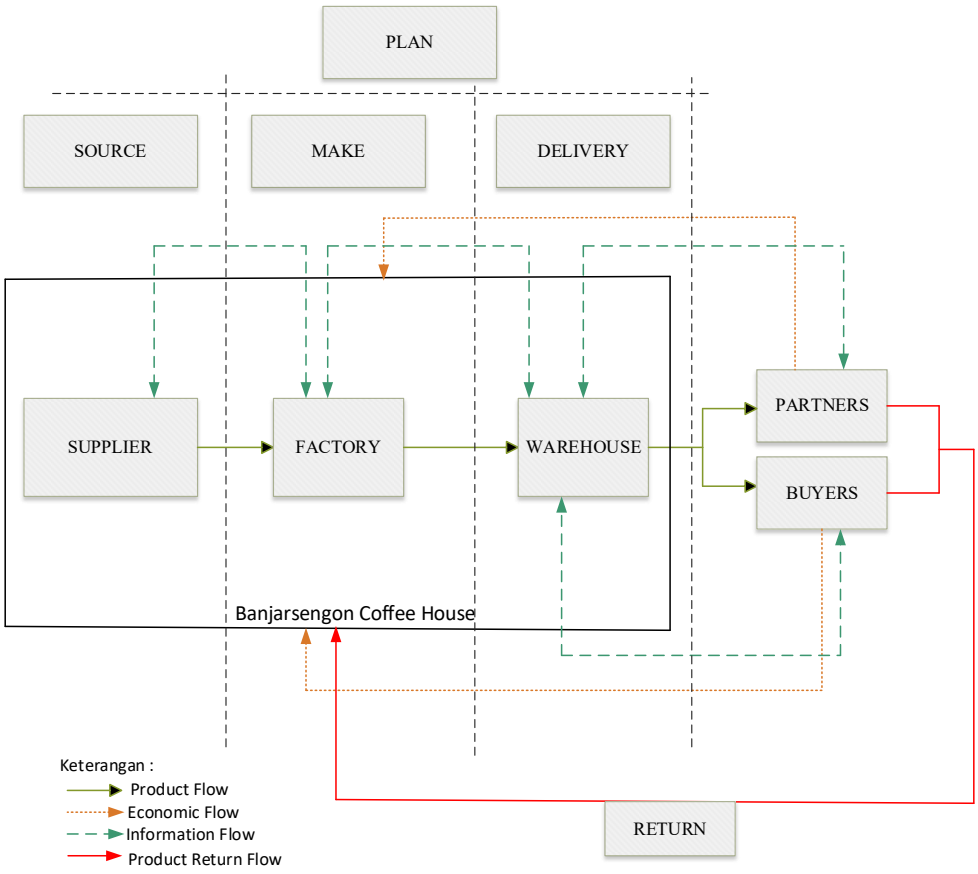

Figure 1. Supply Chain Structure of Banjarsengon Coffee House in Jember

The actors in the coffee production supply chain at Banjarsengon Coffee House Jember consist of suppliers, factories, warehouses, and partners or consumers. Supply chain activities are classified based on five perspectives, including plan, source, make, delivery, and return. Activities in the plan process include product planning and control, material planning, capacity planning, and production scheduling. The source process is classified based on the parties involved in carrying out the main activity, namely suppliers. Activities in the make process include the production process, coffee bean quality inspection, coffee product quality inspection, and monitoring of tools and machinery. Delivery activities include the process of shipping or distributing products to partners and consumers. Return activities include the process of returning products that are unsuitable or not accepted by consumers.

3.2. Coffee Production Supply Chain Performance at Banjarsengon Coffee House Jember

The performance of the coffee production supply chain is measured using attributes in SCOR version 11.0 level 1, which are viewed based on external and internal performance. The attributes of external performance consist of reliability, responsiveness, and agility. Meanwhile, the attributes of internal performance are assets (Purnamasari et al., 2025). External performance describes how supply chain actors carry out operational activities that involve external stakeholders to meet customer orders effectively. It can be assessed using five indicators based on supply chain attributes: delivery performance, order fulfillment, order fulfillment lead time, order fulfillment cycle time, and flexibility (Bolstorflf & Rosenbaum, 2004). Internal performance can be measured using two assessment metrics derived from supply chain attributes, namely cash to cash cycle time and daily inventory. In the context of small-scale informal agro-industries, external stakeholders include distribution partners and buyers who have established purchasing relationships with Banjarsengon Coffee House. The evaluation of external performance attributes is conducted through an assessment of the company's operational capabilities in meeting the demands of these partners. The average performance score for the coffee production supply chain at Rumah Kopi Banjarsengon can be seen in the Table 1 below.

Table 1. Average supply chain performance scores

SCOR Attributes and Metrics	Benchmark			Average	Results
	Parity	Advantage	Superior		
Reliability					
Delivery Performance (%)	85.00-89.00	90.00-94.00	≥ 95	93	Advantage
Order Fulfillment (%)	94.00-95.00	96.00-97.00	≥ 98	96	Advantage
Responsiveness					
Order Fulfillment Lead Time (Days)	7.00-6.00	5.00-4.00	≤ 3.00	2.5	Superior
Order Fulfillment Cycle (days)	8.00-7.00	6.00-5.00	≤ 4.00	6.00	Advantage
Agility					
Flexibility (days)	42.00-27.00	26.00-11.00	≤ 10.00	6.20	Superior
Asset					
Cash-to-Cash Cycle Time (Days)	45.00-34.00	33.00-21.00	≤ 20	10.00	Superior
Daily Supply (Days)	27:00-14:00	13.00–0.01	= 0.00	0.31	Advantage

Source: Data processed (2021)

Each performance value reported in Table 1 represents the average of product-level calculations performed separately for the six coffee product types marketed by Banjarsengon Coffee House Jember (Houseblend Argopuro, Robusta Peaberry, Arabika Winey, Robusta Natural, Arabika Natural, and Arabika Honey), based on transaction volumes and time records obtained from company operational data during October–November 2021. This disaggregated calculation approach allows performance variation across product types to be identified, supporting more targeted improvement recommendations in Section 3.3.

3.2.1 Delivery Performance

Delivery performance focuses on the quantity of products delivered. Timeliness and the delivery process in coffee production can be affected by differences in the handling of each product, which

requires different estimated times. The delivery performance value of 93.00% was calculated as the average of product-level delivery performance ratios across the six coffee product types marketed by Banjarsengon Coffee House during October–November 2021. Product-level values ranged from a minimum of 85.00% (Arabika Winey, with 85 kg delivered on time out of 100 kg ordered) to a maximum of 100.00% (Houseblend Argopuro, Robusta Natural, and Arabika Natural, each with full on-time delivery of their respective order volumes: 350 kg, 3,000 kg, and 2,500 kg). The lower performance observed for Arabika Winey and Robusta Peaberry (85.71%, with 60 kg delivered on time out of 70 kg ordered) reflects the smaller production volumes of these specialty product lines, which receive lower scheduling priority relative to higher-volume products such as Robusta Natural and Arabika Natural. This indicates that the delivery performance indicator is in an advantageous position. The advantage classification indicates that approximately 7% of orders are not delivered within the agreed timeframe. Two primary operational constraints underlie this gap. First, product delivery is carried out using the company's own vehicles, which operate at limited capacity (±500 kg per trip), necessitating multiple delivery rounds and increasing the risk of scheduling delays. Second, delivery routes are planned manually without the assistance of route optimization tools, resulting in suboptimal sequencing.

According to Yolandika & Nurmalina (2016), a delivery performance score that is closer to 100 percent means that performance is improving. The delivery performance score at Banjarsengon Coffee House is in an advantageous position because the product delivery process still uses vehicles with low capacity. Additionally, the coffee product delivery process at Banjarsengon Coffee House Jember does not collaborate with third parties or distributors.

3.2.2 Order Fulfillment

Order fulfillment is a reflection of a company's ability to meet consumer demand without requiring waiting time. To determine the order fulfillment value, calculate the number of orders that can be shipped without requiring a long wait for the product to be available as desired by the consumer, divided by the total consumer demand. The order fulfillment value of 96.00% was derived from product-level fulfillment ratios calculated for each of the six coffee product types. Values ranged from a minimum of 85.00% (Arabika Winey, with 85 kg of consumer demand fulfilled without waiting out of 100 kg total demand) to a maximum of 100.00%, achieved by four of the six product types (Houseblend Argopuro, Robusta Peaberry, Robusta Natural, and Arabika Natural). The comparatively lower fulfillment rate for Arabika Winey corresponds to its limited and irregular raw material supply, as this variety is sourced in smaller quantities from selected smallholder plots.

According to Apriyani et al. (2018), several factors that cause companies to be unable to meet all consumer or partner demands include crop failures caused by natural or weather factors, a large number of products rejected by consumers because they do not meet retail demand standards, and a lack of good coordination. At Banjarsengon Coffee House, the primary factors affecting order fulfillment are the variability of raw material supply from private smallholder farms and the duration of the coffee drying process. Because raw materials are sourced predominantly from privately owned plantations, crop failure or yield reduction directly constrains production capacity. Additionally, the conventional solar drying process is highly sensitive to weather conditions; prolonged cloudy or rainy periods extend drying time significantly, delaying the availability of processed product.

3.2.3 Order Fulfillment Lead Time

Order fulfillment lead time is used to determine the average time required by Banjarsengon Coffee House to fulfill an order in one delivery cycle. The order fulfillment lead time of 2.50 days was found to be uniform across all six coffee product types, comprising 1.0 day of packaging time and 1.5 days of shipping time in each case. This uniformity reflects the standardized packaging and shipping procedures applied at Banjarsengon Coffee House regardless of product type, as both processes are performed using the same workflow and delivery fleet. Consequently, the minimum, maximum, and average values for this indicator are identical at 2.50 days. This shows that the order fulfillment lead time value at Banjarsengon Coffee House Jember is in the best position, namely the superior position.

The smaller the order fulfillment lead time value in a company, the better its supply chain performance Setiadi et al. (2018). Banjarsengon Coffee House Jember needs to maintain its best position in order to meet consumer demand quickly without making consumers or retailers wait. Delays in product supply can reduce consumer or retailer ratings of Banjarsengon Coffee House.

3.2.4 Order Fulfillment Cycle

The order fulfillment cycle is a benchmark for the length of time required for each order fulfillment period, measured by the order fulfillment cycle attribute. The smaller the order cycle value, the better the supply chain performance (Yolandika & Nurmalina, 2016). The order fulfillment cycle value of 6.00 days was likewise found to be uniform across all six product types, comprising 2.0 days of planning time, 1.5 days of sorting time, 1.0 day of packaging time, and 1.5 days of shipping time. As with order fulfillment lead time, this consistency reflects the standardized sequence of planning and sorting procedures applied across product types at Banjarsengon Coffee House, independent of product volume or variety. The minimum, maximum, and average values for this indicator are therefore identical at 6.00 days. The order fulfillment cycle value at Banjarsengon Coffee House is in an advantageous position.

Knowing that the order fulfillment cycle value is in an advantageous position at Banjarsengon Coffee House, improvements need to be made so that it can be in the best position. The order fulfillment cycle value can be improved by rearranging the packaging, planning, and delivery times to find the most effective times so that product orders can be fulfilled in accordance with the quantities requested by consumers or retailers.

3.2.5 Flexibility

Flexibility is an indicator used to determine how long it takes for Banjarsengon Coffee House to respond to unexpected orders. Unexpected orders include additional orders or reductions in order quantities by consumers or retailers. The flexibility value of 6.20 days was calculated as the average of product-level flexibility durations across the six coffee product types. Values ranged from a minimum of 5.50 days (four product types: Houseblend Argopuro, Robusta Peaberry, Robusta Natural, and Arabika Natural, each comprising a 3.0-day search cycle, 1.0-day packing cycle, and 1.5-day delivery cycle) to a maximum of 7.50 days (Arabika Winey and Arabika Honey, each requiring a longer 5.0-day search cycle). The extended search cycle for these two product types reflects the additional time required to source sufficient raw material from limited supplier networks for these lower-volume specialty varieties.

Banjarsengon coffee house has a policy for retailers to provide a maximum of one week to change orders before the products are shipped. According to Bolstorflf & Rosenbaum (2004) to achieve the best criteria, a company's supply chain flexibility cycle indicator must be less than 10 days so that consumers do not have to wait too long. The flexibility performance at Banjarsengon Coffee House needs to be maintained so that consumers can feel satisfied in establishing cooperation and receive good reviews from consumers or retailers.

3.2.6 Cash to Cash Cycle Time

Unlike the preceding indicators, cash-to-cash cycle time was calculated at the company level rather than disaggregated by product type, as Banjarsengon Coffee House maintains accounts receivable and accounts payable records in aggregate. The calculation is based on an inventory days of supply value of 1.2 days, a days sales outstanding (average customer payment collection period) value of 10.0 days, and a days payable outstanding (average supplier payment period) value of 1.2 days. Applying Formula (7), the resulting cash-to-cash cycle time is 10.00 days (1.2 + 10.0 − 1.2).

This is in line with what Setiadi et al., (2018) said, that the cash to cash cycle time performance indicator shows the speed of the supply chain in converting inventory into cash. The shorter the cash to cash cycle, the better the supply chain performance. Companies can shorten the cash-to-cash cycle time in several ways, such as reducing inventory levels, negotiating longer payment terms with suppliers, and negotiating with customers to pay faster.

3.2.7 Daily Inventory

Daily inventory is the number of days that existing inventory will last if there is no continuity of supply (Apriyani et al., 2018). The daily inventory indicator is obtained from the average inventory value divided by the average demand expressed in days. The daily inventory value of 0.31 days was calculated as the average of product-level inventory ratios across the six coffee product types, using an average daily demand of 7 kg for each product. Four product types (Houseblend Argopuro, Robusta Peaberry, Arabika Winey, and Arabika Honey) recorded a value of 0.00 days, indicating that no finished goods inventory was carried over for these products due to a make-to-order production approach. Robusta Natural recorded 0.86 days (6 kg average daily inventory against 7 kg average daily demand), and Arabika Natural recorded the maximum value of 1.00 day (7 kg average daily inventory matching 7 kg average daily demand), reflecting a small buffer stock maintained for this high-demand product. This indicates that the daily inventory indicator value is in an advantageous position. Banjarsengon Coffee House only maintains daily inventory for coffee products that are in high demand by consumers. The decision to provide a reserve of these products is made in case of a supply shortage. Therefore, the product reserve can be used as a substitute for products that are in short supply or damaged.

Based on the benchmark data in a superior position, companies should not store products or plan to make inventory. This finding reflects the primary objective of the supply chain, which is to position products appropriately to satisfy customer demand while maintaining optimal inventory levels. (Srihartati, 2004 in Apriyani et al., 2018). According to Setiawan et al. (2011) in Setiadi et al. (2018) the smaller the value of a company's daily inventory indicator, the more it can save on inventory costs and reduce the rate of returns due to long storage times. For agricultural commodities, this is because they will experience shrinkage and a decline in quality.

3.3 Recommendations for Improving Supply Chain Performance

The 7% of orders that miss agreed delivery dates at Banjarsengon Coffee House are attributable to two identified constraints: limited vehicle capacity necessitating multiple delivery trips, and manual route planning without optimization. The following recommendations are proposed to address these constraints. Several recommendations to improve the supply chain performance of coffee production at Banjarsengon Coffee House Jember are as follows:

1. Delivery Performance Indicator
    a. Utilizing third-party shipping services or distributors.
    b. Carefully schedule deliveries and plan the shortest delivery routes so that the delivery process can take place quickly and the products reach consumers at the right time.
2. Order Fulfillment and Order Fulfillment Cycle Indicators
    a. Optimizing the scheduling system (in planting, harvesting, production, and delivery) by considering weather aspects.
    b. Using more advanced technology in the drying process, such as solar drying, to shorten coffee drying time and product delivery time.
    c. Collaborating with other suppliers and not relying solely on the results from the farm.
3. Daily Inventory Indicators
    a. Minimizing daily inventory, as coffee products stored for too long will decrease in quality, and minimizing inventory will reduce coffee production operational costs.
    b. Expanding the marketing network to ensure proper distribution, such as entering modern markets or malls and selling products to individuals.
    c. Determining the safety stock for finished products and raw materials in sufficient quantities.

4. CONCLUSIONS

The supply chain of coffee production at Banjarsengon Coffee House Jember involves four primary actor groups that are suppliers (three to five smallholder coffee farmers in Jember Regency), the production facility, warehouses, and partners or end consumers. Supply chain activities were

mapped across five SCOR process perspectives (plan, source, make, deliver, and return) each of which was found to be operational and functional within the constraints of the company's small-scale.

Based on the measurement of seven supply chain performance indicators using the SCOR model version 11.0 at Level 1, it can be said that the overall supply chain performance of coffee production at Banjarsengon Coffee House Jember is positioned between the advantage and superior classifications. In aggregate, three of seven indicators achieved superior classification and four were classified as advantage, indicating that the company's supply chain is performing at a competitive level relative to foodSCOR benchmarks, with clearly defined areas for targeted improvement.

These findings demonstrate that small-scale coffee agro-industries operating under resource constraints and informal supply network arrangements are capable of achieving supply chain performance that meets or approaches international benchmarking standards when systematically evaluated using the SCOR framework. The application of SCOR Level 1 to a single small-scale robusta coffee enterprise in East Java contributes an empirical case to the limited body of literature on formal supply chain performance measurement in informal agro-industrial contexts in developing regions. Improvement recommendations directed at the four advantage-level indicators offer a practical and context-specific roadmap for elevating overall supply chain performance to the superior level.

Several limitations of this study should be considered when interpreting and applying its findings. First, the research was conducted at a single enterprise (Banjarsengon Coffee House Jember), and findings are case-specific; generalization to other small-scale coffee agro-industries should account for contextual differences in farm location, supplier relationships, technology access, and market structure. Second, supply chain performance data were collected from two internal experts (owner and head of marketing), without external stakeholder validation from customers or suppliers. Third, the data collection period (October–November 2021) coincided with the primary robusta harvest seasonFourth, performance assessment was conducted at SCOR Level 1 only, providing a macro-level overview without sub-process mapping at Levels 2–4. Deeper diagnostic analysis of process-level inefficiencies would require a more granular assessment approach.

Future studies should extend the scope of supply chain performance assessment to encompass multiple small-scale coffee enterprises across East Java and comparable robusta-producing regions, enabling inter-enterprise benchmarking and the development of regional performance baselines. The incorporation of external stakeholder perspectives would strengthen the validity of customer-facing metrics such as compliance with standards and delivery performance. Longitudinal monitoring studies, spanning multiple seasons, would enable assessment of whether the improvement recommendations proposed in this study produce measurable and sustained performance gains. Additionally, future research applying SCOR at Levels 2 and 3 would provide sub-process level diagnostics that could inform more targeted operational improvements.

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