

Re(I)novation of Supply Chain Management for the Improvement of Business Performance in Shallot Commodities

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ABSTRACT

The poor condition of the Shallot Commodity Supply Chain can be observed from the fluctuations from upstream to downstream, due to the dynamic changes in the demand and supply quantities up to the distribution channel amounts. The (Re)innovation of Shallot Supply Chain Management is an innovation from the aspects of Partnership, Contractual Agreements, Transaction Systems, and Government Support. The objective of this research is to analyze the shallot supply chain model using the Food Supply Chain Framework (FSCN) approach. The method used is qualitative descriptive research, describing the behavior of the actors in the supply chain. This research was conducted from August 2022 to January 2023, using primary data collected through in-depth interviews with 152 respondents, shallot farmers in 5 regencies in Central Java. The sampling technique used is purposive sampling. The results of the study on the business performance of shallot commodities in forming an efficient supply chain management require criteria to improve partnerships, indicating that its marketing performance is already running well. Shallot commodity business actors are engaged in partnerships to monitor and evaluate marketing effectiveness periodically. This research has successfully enhanced the capabilities of the resources of the supply chain actors, making them more efficient and effective in transforming the agricultural sector.

Keywords: re(i)novation, shallot, supply chain management, farmer income, business performance

1. INTRODUCTION

One of the most promising and influential industries in this country is agriculture. In the agricultural sector, many activities are related to aspects of food security, improving crop welfare, or addressing poverty and environmental protection (Rahman, 2018). Shallot is one of the food products generated in the field of agriculture that holds high economic value and is a crucial and consistently available product in the market. An aromatic and flavorful spice widely used in culinary and traditional medicine is shallot (Hasanah et al., 2022). This plant variety is essential for seasoning and traditional medicine. Shallots also serve as a source of income for farming communities and make a significant contribution to the economic development of several regions.

The production process of growing shallots involves several stages, starting from seed selection, land preparation, seed selection, plant care, fertilization, plant maintenance, harvesting, and storage. The significance of shallot commodities in business performance underscores the need for exploration into the factors influencing this business performance, ranging from production aspects to distribution and marketing. Business performance analysis is crucial in identifying constraints, potentials, and strategies that can be applied to enhance the competitiveness of shallots in both local and international markets.

Based on in-depth interviews with 152 farmers spread across 5 regencies in Central Java, namely Boyolali, Brebes, Demak, Kendal, and Temanggung, it was observed that throughout this entire process, shallot farmers consistently face production and price risks. Production risks consist of internal and external factors. Common internal issues include limited land control, lack of capital, farmers' inability to adopt technology, and common external issues such as unpredictable weather, increasing pest and disease attacks during off-season planting,

pesticide usage, and uncontrolled changes in the microclimate of the seeds, as well as the use of less quality varieties.

Meanwhile, issues arise when the risk of a decline in shallot prices is exceptionally high during the peak harvest season. Farmers' behavior in dealing with risks is influenced by the magnitude of the risks they face and how they manage these risks in their agricultural endeavors. Therefore, an innovation in Supply Chain Management is necessary to enhance business performance, ultimately improving the sustainability and competitiveness of the shallot sector. Several solutions to mitigate production risks require thorough planning, starting from the management of irrigation systems, selecting suitable varieties, and consistent monitoring and care. In facing price risks, it is crucial to be involved in monitoring agricultural conditions and market movements.

The connection between the business performance of shallots and Supply Chain Management is closely intertwined, as it encompasses all stages and activities involved in producing, distributing, and marketing shallots. With a strong focus on an effective supply chain, shallot businesses can enhance their performance, reduce costs, and increase competitiveness in the market. Good coordination among various elements is the key to optimizing the potential of shallot businesses.

The objective of this research is to analyze or create a model regarding supply chain management for the business performance of shallot commodities.

2. LITERATURE REVIEW

Performance is a measure of the achievements or successes attained by a company over a specific period. Business performance is the accomplishment of efforts that can be observed through sales levels, aiming to maximize profits to support sustainability, return on investment, turnover, and market share (Gainau and Gusnar Mustafa, 2021).

Supply Chain Management is an integrated manufacturing process and activities that begin with the acquisition of raw materials from suppliers, through value-added processes to transform raw materials into finished products, warehousing, and delivering finished products to traders and buyers. A well-managed supply chain can produce products at low cost, high quality, and on time, achieving the target market that generates profits for the company (Abdirad et al., 2021).

Processes in supply chain management start from product manufacturing, procurement, planning or supervision, operations, and distribution across all sectors, relying on each other to produce high-quality products and allow consumers to receive products effectively and efficiently. In short, Supply Chain Management is a system that encompasses the processes of production, transportation, storage, distribution, and sales of products to meet the manufacturing needs of a company (Hahn et al., 2020; Haudi et al., 2022).

Previous research conducted by Kamila Nur Imaniyah, Wiludjeng Roessali, Suryani Nurfadillah (2022) solely focused on developing business performance in high sales, without considering the continuous growth in demand from the community and the agricultural industry. However, this research has not obtained an in-depth analysis of the evaluation of business performance without considering the development of demand for innovations that have not been implemented. Therefore, a new model is discovered, indicating the need for improvement through the implementation of several innovations that can be applied by farmer groups, including: Artificial Intelligence (AI) for transportation companies that can help optimize delivery route planning, Internet of Things (IoT) to monitor soil moisture, Blockchain technology that can be used to establish more secure business relationships with suppliers and warehouse partners, retailers, and consumers from the company.

3. RESEARCH METHOD

Scope of the Research

The focus of this research is to be the object of the shallot supply chain system in 5 regencies in Central Java, including Boyolali, Brebes, Demak, Kendal, and Temanggung.

Type and Source of Data

The type of data used in this research is primary data. According to Sugiyono (2019), primary data is a type of data collected directly from the primary source, either individuals or collectives.

Data Collection Techniques

Data collection is conducted using qualitative data obtained through four methods, namely:

- a. Documentation Study: This study involves data sources directly from the researcher, such as activity reports and research data (Sugiyono, 2018).
- b. Participant Observation: Observation is a data collection technique with its own characteristics compared to other techniques. The findings of this research involve direct field research to identify related factors, supported by focused group discussions and questionnaires led by students at Dian Nuswantoro University.
- c. Focus Group Discussion (FGD): FGD is used as a data collection method when researchers want to conduct preliminary research to identify potential problems and to get a general overview of the shallot supply chain, especially involving supply sources such as farmers, collectors, wholesalers, and retailers. Through interviews, insights were obtained to create a causal loop diagram (CLD) model supported by supporting factors through literature reviews. The results of the causal loop diagram model are then validated by stakeholders through interviews to ensure that the generated model is consistent with the actual system.
- d. Questionnaire: Questionnaires are used to disseminate information by providing a list of comments to be distributed to a number of respondents. This data collection serves as secondary data sources, including population or farmer numbers, shallot cultivation methods, and other data. It also includes visual representations of field activities.

From the results of these interviews, insights were obtained to create a causal loop diagram (CLD) model supported by supporting factors through literature reviews. The resulting model was then validated by stakeholders to ensure consistency with the actual system.

In the shallot supply chain system, there are numerous stakeholders from upstream to downstream, representing the supply chain system of shallots from the 5 regencies in Central Java: Shallot farmers, collectors, wholesalers, retailers, and end consumers. This research focuses only on the supply chain at a higher level, including farmers, collectors, wholesalers, and retailers.

Table 1. GUIDE TO INTERVIEW QUESTIONS

1. How many times do you plant shallots in a year?
2. In which month do you usually plant shallots?
3. How long does it take from planting shallots to harvesting per planting season?
4. How many kilograms of shallot seeds do you need for one planting season?
5. What variety of shallots do you use?
6. How do you acquire the funds for the cost of planting shallots?
7. What fertilizer do you use in the process from planting to harvesting?
8. Where do you source organic fertilizers?
9. Where do you source inorganic fertilizers?
10. What brand of inorganic fertilizer do you use?
11. How many kilograms of fertilizer, on average, do you need in one planting season?
12. What pests and diseases are common during shallot cultivation?
13. Where do you usually purchase pesticides?

Source: Author's elaboration, 2023

Population and Sample

Population is a generalized field that encompasses subjects or objects whose qualities and characteristics are determined by the observer for examination and then drawing conclusions (Sugiyono, 2018). In this study, the population consists of shallot producers in 5 regencies in Central Java, represented by the efforts of a group of farmers. This research was conducted in the agricultural industry that has implemented strategic control, performance measurement, and supply chain management.

A small part of the characteristics possessed by the population is the sample (Sudjana, 2019). The sample follows established procedures to achieve the goals and research issues developed. The sample size in this research is the interest of farmer groups in the performance of shallots in 5 regencies, including Boyolali,

Brebes, Demak, Kendal, and Temanggung. The research sample is represented by farmer groups in the agricultural industry that have implemented strategic planning, performance measurement, and supply chain management.

This research uses purposive sampling, which is a sampling method intentionally chosen to meet the needs of the research. This technique is deliberately applied to several samples based on requirements such as nature, characteristics, features, and criteria for sample selection.

Table 2. Research Samples

1. Temanggung	28
2. Kendal	25
3. Demak	70
4. Brebes	16
5. Boyolali	13

Number of Samples 152

Source: Author's elaboration, 2023

Data Analysis Techniques

Qualitative data analysis is conducted when empirical data consist of a collection of words derived from a series of numbers and cannot be organized into a classification or category structure. Qualitative analysis uses words that are typically organized in extended texts and does not employ mathematical or statistical calculations as a means. However, data is usually processed before use and can be collected in various ways, such as interviews, observations, tape recordings, and document summaries.

4. RESULTS AND ANALYSIS

The following is an explanation of the stakeholder profile of the (Re)innovation of Supply Chain Management for the Improvement of Business Performance in Shallot Commodities in 5 Regencies, namely Temanggung, Kendal, Demak, Brebes, and Boyolali."

The shallot farmer supply chain system needs assistance in improving business performance. This involves explaining the stakeholder profile that includes various parties from upstream to downstream. The following diagram illustrates the shallot supply chain system in 5 regencies in Central Java: Boyolali, Brebes, Demak, Kendal, and Temanggung:

Shallot farmer-Collector-Trader-Final Consumer

This research solely focuses on the top-tier of the supply chain, including farmers, collectors, and large-scale traders, as well as small-scale traders and end consumers.

1. Red Onion Farmers

The red onion supply chain in five districts consists of red onion farmers, who are responsible for the quality, quantity, and availability of red onions. In this study, 152 red onion farmers from five districts in Central Java were involved. The interviewed farmers are members of farmer groups established by the local Agricultural Extension Agency.

2. Collector

Collectors are supply chain companies that gather red onion products from farmers for direct distribution to wholesale traders in the city and beyond. Collectors come from five districts in Central Java. By knowing when the harvest will arrive, collectors maintain the trust of farmers in distributing their harvest. Additionally, they uphold the trust of wholesale traders in providing products with the desired quality and agreed-upon prices. Buyers usually purchase directly from farmers by cutting the onions straight from the ground. Collectors buy between two and three tons of red onions per transaction.

3. Local Wholesale Traders

Local retail traders participating in the red onion supply chain come from five districts and purchase red onions in large quantities from collectors or directly from farmers. Local wholesale traders have various objectives, ranging from direct sales to retailers and consumers.

4. Non-Local Wholesale Traders

Non-local wholesale traders are large traders who come from outside the five districts to sell red onions to retailers or local wholesale traders for resale in farmer market stalls with local wholesale traders and retailers. However, they have previously negotiated prices and products. Non-local wholesale traders typically buy more, around ten to fifteen tons in one transaction.

5. Retail Traders

Retailers are the final option in the local and non-local red onion supply chain. In this study, retailers purchase red onions from local wholesalers and sell them to end customers. Retailers usually buy red onions in small quantities, typically between 50 to 100 kg.

6. Consumers

End consumers are the main actors in the supply chain; in this case, those who personally consume red onions. The consumers in this study are from five districts in Central Java.

Model for Supply Chain Management Renovation for the Improvement of Business Performance in Red Onion Commodity across 5 Districts: Temanggung, Kendal, Demak, Brebes, Boyolali.

Supply chain actors in the above-mentioned five districts include collectors, local wholesale traders, non-local wholesale traders, local retailers, and non-local retailers involved in red onion supply chain management, including goals, structure, flow, and Re(I)novation.

a. Supply Chain Targets

Market Targets

The red onion market in the five districts is still dominated by domestic market satisfaction and red onion products for consumption.

Development Objectives

The red onion farming industry in the five districts should achieve goals to strengthen the sector through the implementation of sustainable partnerships, such as collaborations or other coordination, with the aim of reducing red onion prices to a level where consumers can efficiently produce red onions.

b. Supply Chain Structure

To carry out the tasks of the red onion supply chain activities that involve farmers and end consumers, a marketing organization is required, playing a crucial role in marketing.

Re(I)novation of Supply Chain Management

Supply chain management, also known as chain and network, addresses various issues, such as:

a. Partnerships

The process of selecting partners to collaborate with the company is known as partner filtering. Red onion farmers from five districts in Central Java decide to sell their harvest to consumers who pay more and are already customers. Red onion farmers using the cutting system usually find buyers willing to offer the highest price. Many collectors visit farmers' fields during harvest time to give them rewards. Additionally, harvest traders can choose red onion production partners based on distance and the best prices. The goal of these criteria is to reduce travel costs. Red onion pickers and local and non-local wholesalers with retailers usually rely on registration and trust.

b. Contractual Agreements

Contracts regarding agreements between two parties collaborating informally and formally are called contractual agreements. Agreements on red onions depend on land area and selling prices. However, contracts between traders include quantity and selling prices. Farmers, collectors, and wholesalers usually have known this for a long time.

c. Transaction Systems

The transaction system between red onion producers and collectors is direct payment (cash). The same applies to local wholesale traders, non-local wholesale traders, and others; most retail traders do the same in cash. This is just an agreement among local wholesale traders. In places that collect money, sometimes

there is a one-day delay after the transaction, and payment is then made through inter-account transfers. Negotiations are based on price information obtained from farmers and other traders. Most transactions take place in farmers' fields, in drying machines, and also in large market stalls. This system is known as the "bargaining" system, as done by many other commodity traders. To simply sell red onions to wholesalers outside the area, traders collect and send their goods themselves and bear the shipping costs.

d. **Government Support**

Various forms of support are provided by the government in these five districts, including fertilizer subsidies in each region, cultivation coaching for quality red onion production, and subsidies for well construction to irrigate red onion fields.

Examining the aspects of production and price risks on Business performance, the data of red onion commodities and supply chains are now the starting point for stakeholder collaboration in areas such as information openness, cooperation, and integration among those involved in the supply chain. Furthermore, effective management ensures that the business processes run smoothly. Policies are needed to improve red onion supply chain management by focusing on the provision of quality and certified seeds at affordable prices through several innovations that can be applied by farmer groups, including: Artificial Intelligence (AI) in transportation companies that can help optimize delivery route planning, Internet of Things (IoT) for soil moisture monitoring, Blockchain technology for secure business relationships with suppliers and warehouse partners, retailers, and consumers from the company, so that the red onion yield is expected to increase. Procurement can be through the national agricultural cooperative to obtain local red onions at stable prices.

5. CONCLUSION

Summary

The management of the red onion supply chain in the five districts of Central Java includes supply chain goals, supply chain structure, supply chain flow, and supply chain management Re(I)novation. Actors in the red onion supply chain in these five districts include collectors, local wholesale traders, non-local wholesale traders, local retailers, and non-local retailers. Red onion commodity farmers always face production and price risks, necessitating the implementation of good business performance with various innovations, such as Artificial Intelligence (AI) in transportation companies to optimize delivery route planning, Internet of Things (IoT) for soil moisture monitoring, Blockchain technology for secure business relationships with suppliers, warehouse partners, retailers, and consumers from the company.

Recommendations

According to the conducted research, it can be concluded that the assessment of the performance of the processed red onion product supply chain should be conducted periodically. This will allow the identification and evaluation of the success of the processed red onion product supply chain. Stakeholders, from red onion farmers to collectors, traders, and end consumers, need to embrace several innovations, including AI in transportation companies for optimized delivery route planning, IoT for soil moisture monitoring, and Blockchain technology for safer business relationships with suppliers, warehouse partners, retailers, and consumers from the company. Government involvement is also crucial to improve access for farmer group businesses to agricultural loans and insurance, as well as to enhance the red onion price information system achievable through market information services (PIP). This research can also be further developed to create methods for improving the business performance of the supply chain from the company, such as improving bookkeeping for better document and sales record management, thereby enhancing business performance scores.

Limitations of the Research

The research was conducted through a qualitative approach using primary data, and initial information was gathered through in-depth interviews. The limitation of this research is the subjectivity of the researcher. Bias persists in this research because it heavily relies on the researcher's interpretation of the interview meanings. To reduce bias, the process of triangulation—triangulating sources and methods—was performed. Methodological triangulation involved using multiple data collection methods,

including in-depth interviews and observations. Source triangulation involved cross-testing data between different informant data and other research findings.

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