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## **Evaluation of supply chain management model of organic lettuce produced in rural areas**

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**Abstract.** The study aimed to: (1) identify supply chain management model of organic lettuce; (2) identify the institutions involved in organic lettuce marketing; (3) identify the marketing functions by each trader; and (4) evaluate the supply chain management performance. This research was conducted in Kedungbanteng District, Banyumas Regency Central Java Indonesia. The study was conducted through survey and census. The study involved 8 farmers, 3 traders, 2 suppliers, and 6 retailers. The result shows that there were two supply chain management models of organic lettuce: (i) producers → suppliers → retailers → consumers and (ii) producers → retailers → consumers. Institution involved act as traders, suppliers, and retailers; Suppliers act marketing functions such as harvesting, buying, packing, labelling, pricing, transporting, risk coverage, funding, selling, and marketing information; retailers act marketing functions such as storage and selling. Farmer's share was 42.4-61.42%, price's coefficient of variance in producers' level were 0 and 6% in the consumers; index of technical efficiency in channel 1 and 2 were 0.62; while index of economic efficiency on channel 1 was 1.09 and 0.30 on channel 2. It can be concluded that supply chain management model of organic lettuce in Kedungbanteng, Banyumas Regency was moderate efficient.

### **1. Introduction**

Lettuce (*Lactuca sativa* L.) is a group of leafy vegetables that are well known in the community [1]. Demand for organic lettuce increases as people's economic conditions increased, and can be used for many food ingredients. Organic lettuce is a good source of minerals, pro-vitamin A, vitamin C and fibers. The other benefits of organic lettuce are an anti-aging agent, maintain weight, cure constipation, prevent cancer, relieve a headache, and overcome insomnia.

Since 1998 the farmers in Kedungbanteng district, Banyumas regency has been tried to cultivate plants such as water spinach, spinach, and lettuce without chemical fertilizers and pesticides. The farmers used organic fertilizers and pesticides. The harvested lettuce labeled as organic product, so their product can be sold in supermarkets. Lettuce farmers have selling their harvest to supermarkets by two methods. First, the farmers sell their harvested lettuce to suppliers, and then the suppliers sell lettuce to supermarkets. Second, the farmers sell their harvested lettuce directly to supermarkets.



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Galdeano et al. [2] studied food exporters and co-opetition relationships: an analysis on the vegetable supply chain. Purpose of their research was to provide empirical evidence on the influence of co-opetition on food exporting in different distribution channels, taking as reference the vegetable farming-marketing sector in southeast Spain. Their results obtained that diverse forms of collaboration with competitors, in both horizontal (such as logistics and research projects) and vertical dimensions (such as promotion and quality certifications) have positive effects on vegetable export propensity. These influences become more apparent when large retailers are the main buyers.

The research about impact of supply chain management practices on firm's performance: Empirical evidence from a developing country has done [3]. Single sentence summary from them: "Their research suggest that the supply chain management practices are positively related to supply chain performance in the organized retail industry in a developing country like India".

Mesa [4] have conducted study about collaborative firms managing perishable product in complex supply network. Their research findings were cooperation strategies which have positive effects on performance (market creation, promotion, quality, training, joint supply purchases and research ventures). Moreover, the retail channel and market diversification had positive effect on the relationship between cooperation and the supplier's performance. They demonstrate that active cooperation strategies have a greater bearing on performance in those firms whose primary customers are retailer.

The object of previous researcher was big element in supply chain of certain product, and this product was export oriented. They analyzed collaboration and how it affects the supply chain management performance, including collaboration between small producers in rural areas with modern retailers need to be researched to increase understanding of supply chain management. In this study we tried to analyze small producers of organic lettuce in rural area but they can act as supplier to the retailers (modern market).

The main problems in this research were: (1) how is the supply chain management of organic lettuce from rural area; (2) what institutions are involved in the marketing of lettuce from rural areas; (3) what marketing functions are performed by each marketing institution; (4) how lettuce marketing performance in rural areas; and (5) how is the efficiency of organic lettuce supply chain management in rural area. Then the aim of this research is: (1) to know the model of supply chain management of organic lettuce from rural areas; (2) to identify what institutions are involved in rural lettuce marketing; (3) to know what marketing functions are performed by each marketing agency; (4) evaluate the performance of rural lettuce marketing and (5) evaluate the efficiency of the organic lettuce supply chain management in rural areas.

## 2. Methods

The survey methods that used in this research was conducted to obtain facts from existed tendency and to find information factually, either about the social, economic or political institutions of a group or an area.

### 2.1. Place and time

The study took place in rural areas (Windujaya and Melung Villages, Kedungbanteng District, Banyumas Regency Central Java Indonesia). The locations determined purposively, because there was the only place organic lettuce produced. The research was done in May – August 2017.

### 2.2. The research objects

The organic lettuce farmers and the institutions that involved in organic lettuce marketing process.

### 2.3. Determining the samples

The census method was used because there only 8 farmer respondents (6 farmers from Windujaya and 2 farmers from Melung). The snowball sampling method was used to determine trader respondents.

#### 2.4. Data sampling methods

The methods used in data sampling was: observation, interview, and literature review. Primary data and secondary data were used in the research.

#### 2.5. Research variables

Including: purchase volume; sales volume; purchase price; sales price; risk coverage costs; package costs; profit; sales margin; farmer's share; merchant's share; cost share; profit share.

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#### 2.6. Data analysis

**2.6.1. Descriptive analysis.** The analysis method used to identify supply chain process of organic lettuce from producers to consumers.

**2.6.2. Marketing margin.** The analysis method used to identify the margin between prices in the consumers and prices in the producers and it is distribution to merchant.

**2.6.3. Farmer's share.** The farmer's share is a portion of price that consumers paid and received by farmers.

**2.6.4. Technical efficiency and economic analysis.** To analyse the organic lettuce marketing channel efficiency, we have use techniques efficiency index (T) and economic efficiency index (E).

### 3. Result and discussion

#### 3.1. Organic lettuce marketing channel pattern

The result from this research showed that there are two models of organic lettuce supply chain management. The supply chain is relatively short. The organic lettuce supply chain needed to be shortened because the commodity easily damaged and need to be freshly consumed, so the shorter supply chain is better. The supply chain management models in rural areas were.

The first model (short channel): farmers → collector merchants/traders/suppliers → supermarkets → consumers. In this model, farmers did not take any marketing function. The farmers focused on organic lettuce farming. Then the collector merchants or traders collected from farmers and supplying to supermarkets. The collector merchants did marketing function such as: collecting lettuce, transporting lettuce to supplier's warehouse, transporting lettuce to supermarkets, packing, labeling, pricing, risk coverage, and searching market information.

The second model (direct channel): farmers → supermarkets → consumers. In this model the farmers act as suppliers for supermarkets. The farmers did marketing function, the difference is that they do not supplying to only one supermarket. The farmers did market such as: collecting lettuce, transporting lettuce to supplier's warehouse, transporting lettuce to supermarkets, packing, labeling, pricing, risk coverage, and searching market information.

#### 3.2. Involved institution

The institutions involved in organic lettuce marketing in Kedungbanteng Regency, Banyumas Regency namely: collector merchant, suppliers, and modern retail. Based on research result there were three farmers who sold their product to markets directly, and five farmers sold their product to suppliers. The farmers that act as suppliers did not cooperate with each other.

#### 3.3. Marketing institution function

The results showed that there were three farmers who act as collectors and suppliers to the supermarkets. Most farmers do not perform marketing functions, they only focus on growing some vegetables, such as water spinach, spinach, and organic lettuce. Collector merchants perform purchasing functions to farmers, harvesting functions, transport functions from farm to warehouse.

The suppliers do purchase, packaging, labeling, pricing, risk coverage, market information search, and transporting to the supermarkets. The retail does sell the product to consumers. The retail determines the price of approximately (20 - 25) % of the retail price in the supermarket.

### 3.4. Organic lettuce market performance

The performance of markets was limited to farmer's share indicator, marketing margin, price coefficient of variation, and correlation of price between farmer's price and supermarket's price.

**3.4.1. Farmer's share.** Supply chain model 1 (short channel): farmers - traders' collectors/suppliers – supermarkets. In this model, the average farmer selling price was IDR 2,000.00/bundle, while the average retail price in the supermarket was IDR 4,708.00 / bundle, so the farmer's share was equal to = 42.48%. The value of farmer's share of that amount indicates marketing channel model 1 is still not efficient. This was because the distance from the sale of production farm to the supermarket only about 15 km and still enough to use the motorcycle so the value of farmer's share could be above 50%. Whereas farmers can check producer price of the products they produce in supermarkets, so they can feel disappointed when knowing the selling price in the final consumer was two times more than the selling price they received. This condition was thought to cause organic lettuce producers not to increase in the last 10 years, but their numbers were even reduced.

Supply chain model 2 (direct channel): The farmers also function as marketing institutions that sells directly to supermarkets (producers - supermarkets). In the second model, the average selling price of farmers was IDR 2,892.00 / bundle, while the average selling price of Retail Supermarkets was IDR 4,708.00 / bundle, so the farmer's share was 61.42%. In this channel, the marketing channel was efficient, indicated by the indicator of farmer's share above 50%.

**3.4.2. Marketing margin.** The marketing margin is shown on **Table 1**. It is known that the marketing margin of lettuce from Kedungbanteng District Model 1 (short channel) was bigger than Model 2 (direct channel), which was IDR 2,708.00/bundle. Whereas in Model 2 the marketing margin was IDR 1,816.00/bundle. The difference was IDR 892.00/bundle. This was because on the channel Model 1, there was no suppliers because the farmers were able to sell by themselves to the supermarket so that the farmers can accept the selling price of IDR 2,892.00/bundle, while the selling price on model 1 was only IDR 2,000.00 /bundle, with a difference of IDR 892.00/bundle.

The price difference was very meaningful for the farmers, because the average sales volume of farmers were 63 bundles/transactions every 4 days, so that if the farmers can sell their own lettuce to the supermarkets, they will get an additional profit of 63 bundles x IDR 892.00/bundle = IDR 56,196/transaction every 4 days or with sales frequency of 7 times per month, farmers will get additional profit of IDR 393,372.00/month.

**3.4.3. Price coefficient of variance.** The value of price coefficient correlation between farmers selling price and supermarkets selling price was zero, because there was no difference in price in each farmer. The absence of price correlation between farmer selling price and supermarket selling price indicates that the marketing of organic lettuce from Kedungbanteng district of Banyumas Regency from producer side is not efficient, especially supply chain model 1 (short channel).

**3.4.4. Efficiency model supply chain.** Data used to calculate the technical and economic efficiency index is shown in **Table 1**. Index of technical efficiency of lettuce marketing channel is calculated by the formula:

$$T_{ij} = V_{ij} / W_{ij} / d_{ij} \text{ Model 1 : IDR } 1,392.59/150 \text{ gram}/15 \text{ km} = 0,618$$

$$\text{Model 2: IDR } 1,392.59/150 \text{ gram}/15 \text{ km} = 0,618$$

Index of economic efficiency of lettuce marketing channel is calculated by the formula:

$$E_{ij} = \frac{\sum k(\pi_{ijk})}{V_{ij}} \text{ Model 1} = \text{IDR } 1,527.00 / \text{IDR } 1,393.00 = 1.096$$

$$\text{Model 2} = \text{IDR } 424.00 / \text{IDR } 1,393.00 = 0.30$$

Based on indicators of technical efficiency index and economic efficiency index, it can be concluded that model 1 (short channel) marketing channel was more efficient than model 2 (direct channel). This was because the trading volume on the channel was higher than the trading volume in model 2, which tends to be more technically efficient.

**Table 1.** Organic lettuce marketing margin in rural areas

Cost and Profit	Pattern 1	Pattern 2
Farmer's selling price (IDR/bundle @150 g)	<b>2,000.00</b>	<b>2,892.00</b>
Supplier's purchase price (IDR/bundle)	2,000.00	-
Labeling cost (IDR/bundle)	100.00	100.00
Packaging cost (IDR/bundle)	100.00	100.00
Harvest Labor (IDR/bundle)	71.43	71.43
Packaging Labor (IDR/bundle)	71.00	71.00
Supplier labor (IDR/bundle)	107.14	107.14
Fuel cost (IDR/bundle)	125.00	125.00
Risk coverage cost (IDR/bundle)	182.44	182.44
Total cost (IDR/bundle)	757.01	757.01
Supplier's profit (IDR/bundle)	891.69	-
Supplier's selling price (IDR/bundle)	<b>3,648.70</b>	<b>3,648.70</b>
Supplier's margin (IDR/bundle)	1,648.70	-
Supermarket cost (IDR/bundle)	635.58	635.58
Supermarket's profit (IDR/bundle)	423.72	423.72
Supermarket's selling price (IDR/bundle)	<b>4,708.00</b>	<b>4,708.00</b>
Supermarket's margin (IDR/bundle)	1,059.30	1,059.30
Total marketing cost (IDR/bundle)	1,392.59	1,392.59
Total profit (IDR/bundle)	1,527.27	423.72
Total marketing margin (IDR/bundle)	<b>2,708.00</b>	<b>1,816.31</b>

#### 4. Conclusion

There were two models of organic lettuce supply chain from rural areas. Model 1 (producers → suppliers → supermarkets) with 42.86% market share value and model 2 (producers → supermarkets) with 57.14% market share value. Model 1 margins was IDR 2,708.00/bundle and higher than Model 2 margin IDR 1,816.00/bundle. Based on indicators of technical efficiency index and economic efficiency index, it can be concluded that model 1 (short channel) marketing channel is more efficient than model 2 (direct channel), because the trading volume on the channel was higher than Model 2, which tended to be more technically efficient.

#### 5. Suggestion

Farmers earned substantial additional profit, if they sold their commodities directly to the supermarket with a consignment system. The farmers in rural areas need to cooperate in marketing process for better technical efficiency and economic efficiency.

#### 6. Research limitation

This paper limited on the evaluation of supply chain performance such as market share, farmer's share, marketing margin, price coefficient of variance, technical efficiency and economic efficiency index. Further research needs to be carried out related to supply chain indicators such as smooth product, smooth information and smooth money.

## 7. Acknowledgments

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## References

- [1] Mujiono, Suyono, Purwanto 2017 *Planta Tropika: Journal of Agro Science*, Vol 5 (2), pp. 127-131. DOI: 10.18196/pt.2017.073.127-131
- [2] Galdeano E, Juan C P, Cynthia L G 2015 *British Food Journal*, Vol 117 (5), pp.1596-1609. DOI: <https://doi.org/10.1108/BFJ-07-2014-0255>
- [3] Gandhi A V, Ateeque S, Pratima A S 2017 *International Journal of Retail & Distribution Management*, Vol 45 (4), pp. 366-384. DOI: <https://doi.org/10.1108/IJRDM-06-2015-007>
- [4] Mesa P, Juan Carlos 2015 *Supply Chain Management: An International Journal*, Vol 20 (2), pp.128-138. DOI: <https://doi.org/10.1108/SCM-06-2014-0185>



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