

Analysis of Supply Chain And Value Added of Soybean Commodity In Grobogan Regency

Analisis Rantai Pasokan dan Nilai Tambah Komoditas Kedelai di Kabupaten Grobogan

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ABSTRACT

Soybean as one of national important food commodities has a central role in national food policy and the fulfillment of community nutrition. Indonesia is the largest soybean market in Asia by importing as much as 67.28% or 1.96 million tons of domestic soybean needs, while the remaining 32.72% is produced through domestic soybean production. The length of the supply chain from producers to consumers causes the selling value of products to fluctuate and tends to decrease. This study aims to analyze: (1) Supply chain performance and the factors influencing the marketing channel choice of soybeans in Grobogan Regency. (2) Activities that add value carried out in the soybean supply chain and the distribution of value added of these actors in Grobogan Regency. This research was conducted in Grobogan Regency, Central Java. Primary data were collected through interview techniques using a questionnaire. The types and number of respondents consisted of 100 soybean farmers, 10 collecting traders and 3 processing industries. Analysis of the description of the soybean supply chain is carried out using the FSCN process framework. Marketing efficiency is measured from marketing margins, farmer's share analysis, profit and cost ratio. The factors that determine the choice of farmers to the supply chain used, the quantitative approach to the multinomial logit regression model, and the added value analysis used is the Hayami method. Viewed from the marketing margin, farmer's share, also the profit and cost ratio, channel four is more efficient than other channels. There are several factors that influence the decision making of soybean farmers to sell soybeans. Some of the factors are the knowledge that the farmers have, number of sales (harvest) and selling prices. All secondary soy products produced will be able to increase the income of businesses, including soybean farmers.

Key words: marketing channel choice, profit, small and medium scale, supply chain

ABSTRAK

Kedelai sebagai salah satu komoditas tanaman pangan yang penting, memiliki peran sentral dalam kebijakan pangan nasional dan pemenuhan gizi masyarakat. Indonesia merupakan pasar kedelai terbesar di Asia dengan mengimpor sebanyak 67,28% atau 1,96 juta ton dari kebutuhan kedelai dalam negeri, sementara sisanya sebanyak 32,72% dihasilkan melalui produksi kedelai dalam negeri. Panjangnya rantai pasok dari produsen sampai kepada konsumen menyebabkan nilai jual produk berfluktuatif dan cenderung menurun. Penelitian ini bertujuan untuk menganalisis: (1) Kinerja rantai pasok dan faktor-faktor yang mempengaruhi pilihan saluran pemasaran (*marketing channel choice*) kedelai di Kabupaten Grobogan. (2) Aktivitas-aktivitas yang menambah nilai (*value added activities*) yang dilakukan pada rantai pasok kedelai dan distribusi nilai tambah para pelaku tersebut di Kabupaten Grobogan. Penelitian ini dilakukan di Kabupaten Grobogan, Jawa Tengah. Data primer dikumpulkan melalui teknik wawancara menggunakan kuesioner. Jenis dan jumlah responden terdiri dari 100 petani kedelai, 10 pedagang pengumpul dan 3 industri olahan. Analisis deskripsi rantai pasok kedelai menggunakan kerangka proses FSCN. Efisiensi pemasaran diukur dari margin pemasaran, analisis *farmer's share*, rasio keuntungan dan biaya. Faktor faktor yang menentukan pilihan petani terhadap rantai pasok yang digunakan pendekatan

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kuantitatif dengan model regresi multinomial logit, serta analisis nilai tambah yang digunakan adalah metode Hayami. Jika dilihat dari margin pemasaran, *farmer's share*, dan rasio keuntungan dan biaya, maka saluran empat lebih efisien dibandingkan saluran lainnya. Terdapat beberapa faktor yang mempengaruhi pengambilan keputusan petani kedelai untuk menjual kedelai yaitu pendidikan petani, jumlah penjualan (hasil panen) dan harga jual. Semua produk sekunder kedelai yang dihasilkan akan dapat meningkatkan pendapatan pelaku usaha, termasuk petani kedelai.

Kata kunci: pilihan saluran pemasaran, keuntungan, skala kecil dan menengah, rantai pasok

INTRODUCTION

Agricultural sector is the main sector in Indonesia's development. This sector becomes very important with the role of food providers where food is the main need for humans. One of the food crops that has high quality and nutrition is soybean which is also the most popular source of vegetable protein for Indonesian people in general. Soybean is an important food commodity in Indonesia after rice and corn. This makes soybeans the important food crop commodity for consumption, because of its central role in national food policy and the fulfillment of community nutrition.

Indonesian people consume soy in the form of tempe, tofu, soy sauce, tauco, soy milk and various forms of snacks. More than 80% of Indonesia's population consume soybeans in various forms of snacks (Swatika *et al.* 2013). Soybean consumption is projected to increase every year. Based on data from the Ministry of Agriculture in 2014, the amount of soybean consumption is expected to increase to 2.97 million tons in 2019 with a growth rate of 6.42% annually. According to Tastra *et al.* (2012), the high consumption of soybeans is influenced by two important factors, namely increase of public awareness of soy-based functional food and population increase.

Indonesia is the largest soybean market in Asia by importing as much as 67.28% or 1.96 million tons of domestic soybean needs, while the remaining 32.72% is produced through domestic soybean production. This is because domestic soybean production is unable to meet the demand for soybeans from producers of tempe, tofu and other processed soy products. The percentage of imports to consumption indicates an increasing percentage. This is a worrying phenomenon. The magnitude of this importance figure is one indicator that determines the need for soybeans to meet the needs of the population through various types of processed products (Zakiah, 2012).

In this case, the role of information is needed in minimizing the impact of these constraints. Constraints that arise as a result of changing consumer demand can disrupt the existing supply chain activities. Appropriate information about what and how the tastes of consumers and the conditions and the latest market situation will be very helpful. Information technology has the power to provide timely, accurate and reliable information, a low-cost alternative to reduce the ratio of face-to-face communication which is one solution to reduce uncertainty of information and uncertainty of transaction frequency. Given the important role of information in supporting supply chain performance, it must be understood how information is collected and analyzed. Chopra and Meindl (2007) term information technology as the eyes and ears, even part of the management brain in a supply chain that captures and analyzes information needed for decision making.

The long supply chain from producers to consumers causes ineffective marketing processes. This has caused the selling value of products to fluctuate and tend to decrease. Soybean commodity prices are hardly touched by government policy. Soybean prices are determined by market mechanisms that are determined by demand and supply. Indonesia has 7 (seven) soybean centers which contributed 87.40% to the national soybean production over the past five years (2010-2015), and 27 other provinces contributed 12.60%. The biggest contribution was given by East Java Province with 39.74% (average production of 351.92 thousand tons), followed by Central Java with 14.03% (average production of 124.23 thousand tons), and West Nusa Tenggara 10.65% (average production of 94.33 thousand tons).

Central Java is one of the soybean producing regions in Indonesia. Soybean producing regions in Central Java are in 27 (twenty seven) districts. Grobogan Regency is the largest soybean producing region with a harvest area of 17,869 ha, the second is Wonogiri Regency

with an area of 10,044 ha, followed by Blora Regency at 6,868 ha (Central Statistic Body of Central Java Province, 2017). Research on supply chain analysis and soybean commodity value added was conducted to determine the efficiency of soybean marketing chains in Grobogan. Soybean supply chain management in Grobogan is carried out using the Food Supply Chain Network (FSCN) approach. The Food Supply Chain Network (FSCN) analyzes supply chains with four elements, namely network structure, business processes, management, and resources in the supply chain, all of which are the most important because coordination is included. Through the chain management element of the FSCN, it can be assessed whether the soybean marketing system, which delivers primary products to end consumers, has coordinated as an embodiment of management in the supply chain.

The problem experienced by soybean farmers in Grobogan Regency is the difficulty of reaching plantation locations. The road is steep, rocky, and quite far from the highway. Some areas can still be reached by cars and motorbikes, but there are some that can only be reached on foot. Supply chain performance appraisal is needed to determine the optimization of marketing activities carried out by supply chain members so that the extent of the efforts made in improving supply chain management problems can be seen. The process of marketing soybeans and intermediary institutions that play an important role in the soybean flow chain is less organized. This causes differences in the level of prices in each marketing institution, thus allowing the marketing system to work less efficiently.

The existence of processing the results and improving the quality of production will affect the acceptance of margins and incentives received by farmers, traders and processed industries. From the description, what is interesting to analyze is the added value generated from processing soybeans into their derivative products when the activity is carried out in Grobogan Regency.

Based on the above description, then some problems can be formulated as follows:

1. What is the performance of the supply chain and what factors influence the marketing channel choice for soybean in Grobogan Regency?

2. How do activities that add value (value added activities) carried out by the actors in the soybean supply chain and the distribution of value added of these business doers in Grobogan Regency?

The development of soybean agribusiness in Grobogan not only includes an increase in area and production, but also improvements in yield and marketing quality so that it can have competitiveness compared to soybeans from outside Grobogan Regency. The development of soybeans in Grobogan Regency still has considerable opportunities and potential, especially when related to the lives of the people who mostly still rely on agriculture as their main source of livelihood. Support by local government policy in developing soybeans as one of the potential local resources also provides a great opportunity for the development of soybean farming in this region.

Two things that become a concern in developing soybean farming business in Grobogan Regency are marketing and processing. Important aspects that need to be examined in this case are the soybean supply chain for marketing efficiency and the choice of marketing channels that affect the income received by farmers. Soybean supply chains in Grobogan Regency can be identified by looking at supply chain members, supply chain business processes, supply chain management, and supply chain resources. Besides these four things, it is necessary to look at the objectives of the supply chain and know the performance of the supply chain in order to meet the satisfaction of consumers and all members of the supply chain. Improving the quality and presence of soybean processing will increase the added value and competitiveness of the Grobogan Regency soybeans, where this will increase the price of soybeans on the market so that it will eventually be able to improve the welfare of farmers.

Farmers will choose marketing channels that are more profitable in marketing their soybeans. Many factors affect farmers' choices such as age, sex, length of business, level of education, yield and others. It is important to look at the choice of marketing channels and what factors influence farmers' choices in choosing marketing channels. to make clear, the information is presented in Figure 1.

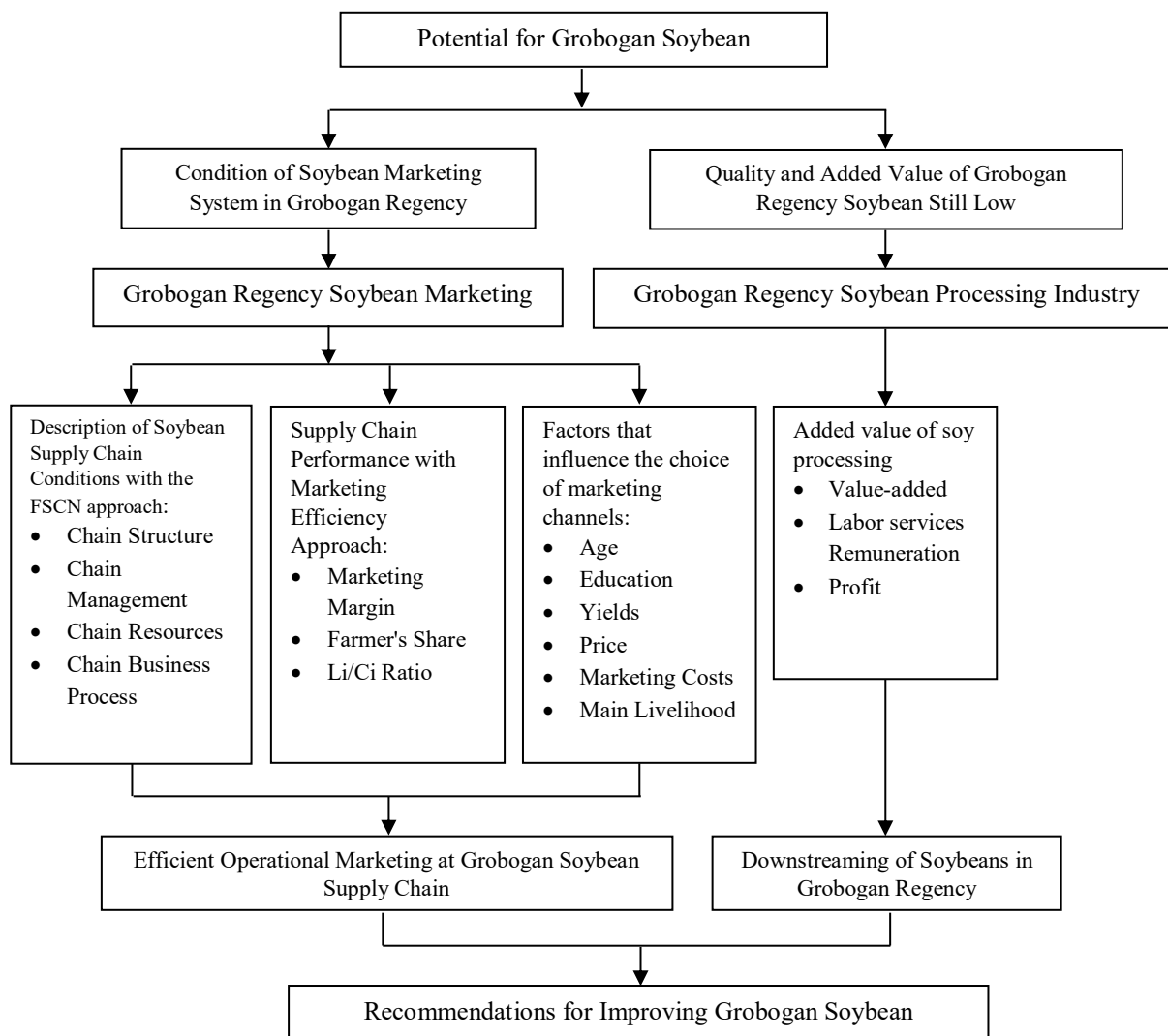


Figure 1. Operational framework

RESEARCH METHODS

This research is a qualitative and quantitative descriptive research mix using a survey method. The study was conducted in Grobogan Regency, as a center for soybean cropping and production in Central Java Province. Specific research locations for this study are Pulokulon District, Kradenan District and Tawangharjo District. This research was conducted in March-April 2019. The population in this study were soybean farmers, collecting traders, processing industries, and large traders. The main sample of soybean farmers is obtained by cluster random sampling method (Table 1). The data used in this study are primary and secondary data. Primary data is data obtained directly from the data source through certain data collection methods to answer research questions, while secondary data is data obtained and

collected based on literature studies or existing sources in order to answer research questions. The data that has been collected is then processed and analyzed. Analysis for the first purpose is to find out supply chain performance and channel selection using Food Supply Chain Networking (FSCN). Then the determination of marketing channel choice is done by conducting multinomial logit analysis using the likelihood ratio test (simultaneous) and the Wald test (partial). Meanwhile, to find the magnitude of factors that influence the choice of marketing institutions, the odds ratio test, marketing efficiency measured from marketing margins, farmer share analysis, profit and cost ratio are used. The second objective is to carry out activities that increase the amount of added value of soybean product processing by applying the Hayami method.

Table 1. The number of respondents of soybean farmers in Grobogan Regency in each study location

No	Location	Population (Ppl)	Sample (Ppl)
A	Tarub Village	1567	16
B	Pojok Village	1671	18
C	Pojok Village	1736	19
D	Panunggalan Village	1657	18
E	Pakis Village	1668	18
F	Crewek Village	923	10
Total		9222	99

Quantitative descriptive research is research to describe the results of research data in the form of numbers. Qualitative descriptive research is research to describe the research data in the form of translation. Research in the form of a survey is a study that takes a sample from a population and compiles a questionnaire as a primary data collection tool (Singarimbun et al, 1989).

RESULT AND DISCUSSION

Supply Chain Relations Structure

The structure of soybean supply chain relationships can be analyzed through the members that form the supply chain and the role of each member and the entities or elements contained in the supply chain such as products, markets, stakeholders, and the competitive situation. The intended supply chain members are actors who are incorporated or involved in the product flow, financial flow, and information flow. End consumers are a part of the supply chain structure because end consumers are also involved in product, financial, and information streaming. Each member of the supply chain has been grouped based on the same role to facilitate discussion. The structure of the soybean supply chain in Grobogan Regency can be seen in Figure 2.

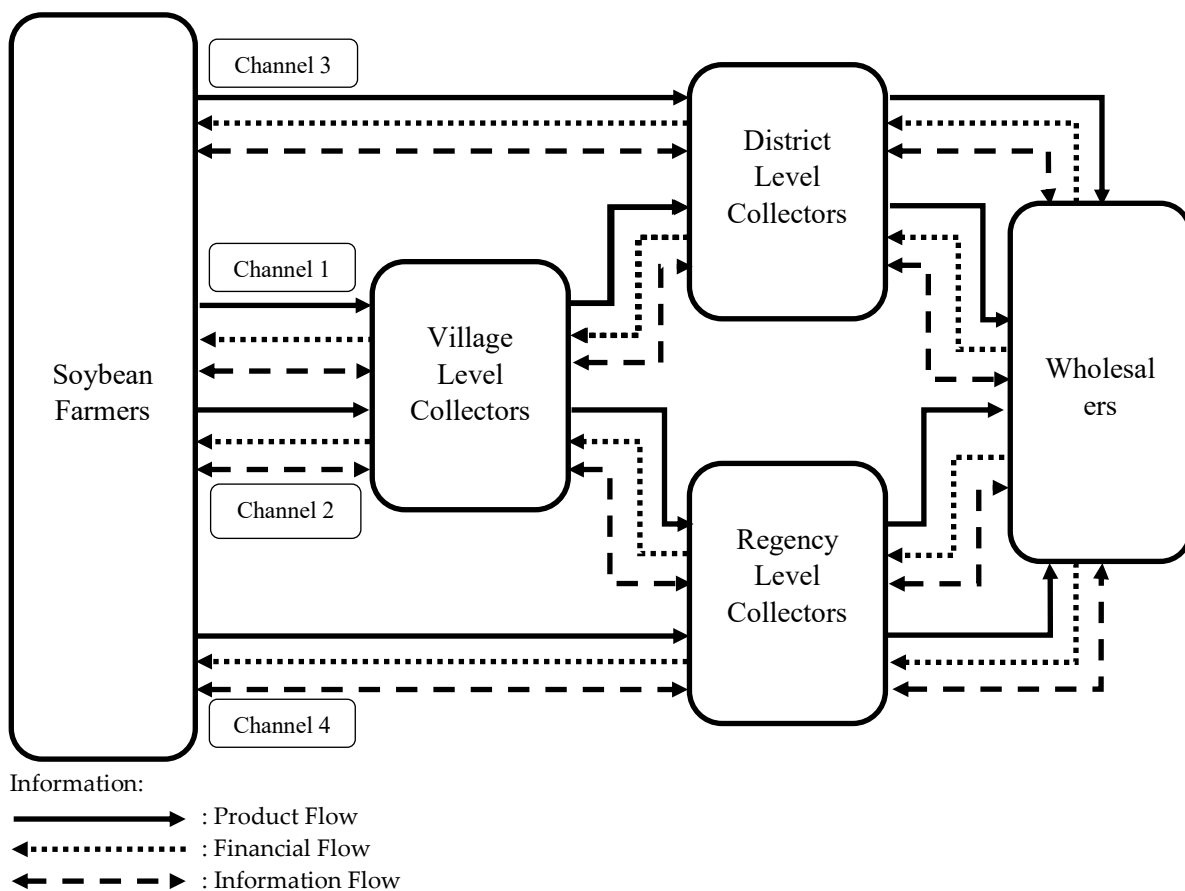


Figure 2. Structure of soybean supply chain in Grobogan Regency

Marketing Margin

The marketing margin indicator is analyzed to determine the difference in income received by each marketing institution in delivering the product to the final consumer and to know the difference in the price of the product received by the final consumer and the price received by the producer. The amount of the total marketing margin is obtained from the number of marketing margins for each member of the supply chain. The marketing margin of each member of the supply chain is the difference between the selling price of the product and the purchase price of the product. Marketing margins reflect the costs incurred by each member of the supply chain and the benefits that each member of the supply chain receives in return for the contribution made.

The magnitude of marketing margins differs between each marketing institution because each marketing agency carries out different marketing activities or functions. Marketing institutions in the soybean supply chain in Grobogan Regency are farmers, village level collectors, district level collectors, and district level collectors. The marketing activities or functions carried out by each marketing institution are the contributions they have made to market soy products. The soybean supply chain can be said to

be efficient if the measurement of the marketing margin is considered small and rational. The components of marketing margins in each marketing institution, namely marketing costs and marketing profits, can be summarized in Table 2.

Farmer's Share

Farmer's share is the second indicator of marketing efficiency in addition to marketing margins. This indicator measures the size of the portion received by soybean farmers as compensation for the contribution made to the price of soybean products at the wholesaler level. The greater farmer share value reflects the increasingly efficient supply chain. However, a farmer's high share does not absolutely indicate that marketing is running efficiently. This relates to the size of the benefits added to the product (value added) made by intermediaries or processing institutions to meet consumer needs. The value of the farmer's share is the opposite of the value of the marketing margin. The greater the value of the farmer's share, the smaller the value of marketing margins. In this study, there are four values of farmer's share based on the final selling price of soybeans and their distribution for example the distribution of channels in the marketing margin analysis.

Table 2. Analysis of soybean marketing margins in Grobogan Regency

Margin Element	Channel 1 (IDR/Kg)	Channel 2 (IDR/Kg)	Channel 3 (IDR/Kg)	Channel 4 (IDR/Kg)
Soybean Farmers				
Selling Rate	6.660	6.660	6.800	7.250
Village Level Sellers				
Purchase Rate	6.660	6.660	-	-
Marketing Costs	78	78	-	-
Profit	252	590	-	-
Selling price	6.912	7.250	-	-
Margin	330	668	-	-
District Level Sellers				
Purchase Rate	6.912	-	6.800	-
Marketing Costs	128	-	128	-
Profit	888	-	1.000	-
Selling price	7.800	-	7.800	-
Margin	1.016	-	1.128	-
Regency Level Sellers				
Purchase Rate	-	7.250	-	7.250
Marketing Costs	-	132	-	132
Profit	-	750	-	750
Selling price	-	8.000	-	8.000
Margin	-	882	-	882
Marketing Cost Total	206	210	128	132
Profit Total	1.140	1.340	1000	750
Margin Total	1.346	1.550	1.128	882

Table 3. Farmer's share of soybean marketing channels in Grobogan District

Marketing Channels	Price (IDR/Kg)		Farmer's Share (%)
	Soy Farmers	Wholesalers	
1	6.660	7800	85.38
2	6.660	8000	83.25
3	6.800	7800	87.17
4	7.250	8000	90.62

Profit and Cost Ratio

The level of efficiency of a marketing system can be seen from the distribution of profit and cost ratios. The marketing system is technically said to be more efficient if the distribution of profit and cost ratios, as well as marketing margins against marketing costs is evenly distributed. Marketing costs are costs incurred by each marketing agency in delivering soybean commodities, which include processing costs, transportation costs, labor, information costs and others. Marketing costs incurred by each institution ranging from farmers to regency level collectors in the process of moving soybeans in Grobogan District, and also the profit from marketing is the difference between the selling price and the purchase price that has been added to the costs incurred by the agency. The profit and cost ratio for each soybean marketing channel in Grobogan Regency can be seen in Table 4.

Marketing Efficiency

Marketing efficiency is the goal to be achieved in a marketing process. Marketing efficiency can be achieved if the existing marketing system has provided satisfaction to the actors involved in it such as farmers, marketing institutions, and end consumers. Some indicators or analytical tools that can be used to measure the level of efficiency include the pattern of marketing channels that are formed, the functioning of marketing functions, market structure, market behavior, and market performance. Marketing efficiency can be measured to determine supply chain efficiency because in the supply chain, there are marketing activities carried out by each member of the supply chain to market their products to the next supply chain members. Soybean marketing efficiency is measured to find out how efficient marketing activities are carried out by soybean supply chain members and whether the use of supply chain resources can be considered optimal or not. Soybean marketing efficiency reflects the distribution of benefits and benefits obtained by each member of the soybean supply chain. Based on the results of the analysis conducted, the value of marketing efficiency for each marketing channel pattern can be seen in Table 5.

Table 4. Profit and cost ratio for each soybean marketing channel in Grobogan District

Marketing Institutions	Marketing Channels			
	1	2	3	4
Village Level Collectors				
Ci	78	78	-	-
Li	252	590	-	-
Li/Ci Ratio	3.23	7.56	-	-
District Level Collectors				
Ci	128	-	128	-
Li	888	-	1.000	-
Li/Ci Ratio	6.93	-	7.81	-
Regency Level Collectors				
Ci	-	132	-	132
Li	-	750	-	750
Li/Ci Ratio	-	5.68	-	5.68
Ci Total	206	210	128	132
Li Total	1.140	1.340	1.000	750
Li/Ci Ratio Total	10.16	13.24	7.81	5.68

Ci : Marketing costs for each institution

Li : Profit of each institution

Table 5. The value of marketing efficiency in each of the soybean marketing channel patterns in Grobogan Regency

Marketing Channel	Price (IDR/Kg)	Total Cost (IDR/Kg)	Margin (%)*	FS (%)	Li/Ci (Total)
1	6.660	206	17.25	85.38	10.16
2	6.660	210	19.37	83.25	13.24
3	6.800	128	14.46	87.17	7.81
4	7.250	132	11.02	90.62	5.68

*Margin percentage: percentage of total margin against the final institution level selling price

In terms of marketing margins, farmer's share, and profit and cost ratios, channel four is relatively more efficient compared to other channels. It can also be seen from the price received by soybean farmers, which is the biggest among the other channels, which is IDR. 7.250,-/kg and with a total marketing cost of IDR.132,-/kg of soybeans in channel four. Even though in the channel the four lowest profit ratios are 5.68, this shows a higher partiality for farmers.

Factors That Influence The Selection Of Soybean Marketing Channels

The analysis used in determining the choice of marketing channels for soybean farmers in Grobogan Regency in selling soybeans is a multinomial logit analysis. This happens because the independent variables encountered are the choice of marketing institutions by soybean farmers in Grobogan Regency are categorical, and the categories are more than two. To find the factors that influence the choice of marketing channels used the likelihood ratio test (simultaneous) and the Wald test (partial). Meanwhile, to look for opportunities for the factors that influence the choice of marketing agencies, the odds ratio test is used. The statistical software used in data processing is SPSS 16. Thus, the logit function obtained from the parameter estimate is:

$$G_1 = - 25.267 + 0.135 \text{ Farmer's Age} - 0.077 \text{ Farming Experience} + 0.461 \text{ Farmer's Insight} + 0.003 \text{ Total of Selling} + 0.002 \text{ Selling Price} + 0.200 \text{ Main Livelihood}$$

$$G_1 = - 742.349 + 0.096 \text{ Farmer's Age} - 0.134 \text{ Farming Experience} + 0.089 \text{ Farmer's Insight} + 0.004 \text{ Total of Selling} + 0.105 \text{ Selling Price} - 1.567 \text{ Main Livelihood}$$

After estimating the parameters, a significance test is performed. Model fitness test (goodness of fit) is used to determine the suitability or the degree of freedom of compatibility of the models that have been

formed. The suitability test of the model used is the Deviance test that follows the distribution-chi-square with free degrees $J-p-1$, where J is the number of samples and p is the number of parameters in the model. H_0 area of rejection is if the $X^2_{counting} \geq X^2_{(J-p-1)}$ test statistic value or the significance of $\leq \alpha$. The statistical results of the Deviance test can be seen in Table 6.

Table 6. Test the suitability of the model

	Chi-Square	Df	Sig.
Deviance	86.385	184	1

Based on Table 6, it is known that p -value of *Deviance* testing of the model obtained is scored as 1, or bigger than α (10%), which means H_0 achieved. This shows that the resulting model is suitable, so there is no significant difference between observation and prediction of the model.

After that the likelihood ratio test is conducted, which is used to determine whether the explanatory variable has a significant effect on the response variable simultaneously. Likelihood ratio test statistics follow the chi-square distribution, so to make a decision in testing a comparison is made with the chi-square table with degrees of free p , where p is the number of parameters in the model. If $G \geq X^2_{(p,\alpha)}$ or with a significance value of $\leq \alpha$. The testing result of likelihood ratio can be seen on the Table 7.

Based on table 6, it is known that the p -value of each variable is explanatory. If the p -value of each explanatory variable is less than α (10%), it shows that H_0 is rejected and means that the explanatory variable simultaneously has a significant effect on the response variable. The explanatory variables that simultaneously and significantly influence the response variable are farmer education, number of sales (yield) and selling price. While the age variables of farmers, farming experience and the main livelihood did not significantly affect the response variable.

Table 7. Test result of likelihood ratio

Effect	Likelihood Ratio Tests		
	Chi-Square	Df	Sig.
Intercept	0	0	-
Age	2.406	2	0.3
Farming Experience	1.449	2	0.485
Education	8.771	2	0.012
Total of Selling	6.291	2	0.043
Selling Price	94.14	2	0
Main Livelihood	2.562	2	0.278

In multinomial logistic regression, significance tests were also carried out individually. The results of individual testing will indicate whether an explanatory variable is suitable to enter the model or not. This Wald test statistic follows the normal distribution and the rejection criterion (H_0 is rejected) if the value of $W > Z_{1-\alpha/2}$ or $W < Z_{1-\alpha/2}$ or with a significance value of $\leq \alpha$. The results of individual significance tests can be seen in Table 8.

In the marketing channels that have been observed in this study, it is known that farmers are more dominant in selling soybeans to village-level traders. This is because soybean farmers in Grobogan Regency have not been able to produce good quality soybeans so the prices received by

farmers are still relatively low. Soybean farmers will be able to receive high selling prices for soybeans if they can sell directly to regency level collectors. To be able to achieve these results, soybean farmers must be able to produce good quality soybeans.

SOYBEAN ADDED VALUE

Value added analysis in soybean product processing activities is carried out to determine the value added of processing raw soybeans into intermediate products (tempe, tofu, soy milk and tempeh chips). In addition, by analyzing the value added, the distribution of margins obtained from the processing activities to the factors of production that have been used in the calculation of value added include products such as (tempe, tofu, soy milk and tempeh chips), raw materials, labor direct work and other input contributions can be known.

Value added analysis conducted in this study starts from the procurement of raw materials for soybeans to marketed products. The basis of calculation in the analysis of value added activities of processing soybean derivative products uses units per kilogram of soybean as the main raw material. Calculation of value added analysis in the soybean processing industry in this analysis is carried out using the Hayami Method.

Tabel 8. Estimation and odds ratio parameter

	Purpose ^a	B	Wald	Sig.	Exp(B)
	Intercept	-25.267	8.300	0.004	
	Age	0.135	1.932	0.165	1.144
	Farming Experience	-0.077	0.890	0.345	0.926
District Level Collectors	Education	0.461	6.245	0.012	1.586
	Harvest	0.003	4.765	0.029	1.003
	Price	0.002	6.673	0.010	1.002
	[PencharianUtama=1.00]	0.200	0.065	0.799	1.222
	[PencharianUtama=2.00]	0 ^b			
Regency Level Collectors	Intercept	-742.349	12390.404	0.000	
	Age	0.096	0.363	0.547	1.101
	Farming Experience	-0.134	0.843	0.359	0.875
	Education	0.089	0.141	0.707	1.093
	Harvest	0.004	1.801	0.180	1.004
	Price	0.105			1.111
	[Main Livelihood=1.00]	-1.567	1.507	0.220	0.209
[Main Livelihood=2.00]	0 ^b				

a. The reference category is: Village Level.

b. This parameter is set to zero because it is redundant

Tabel 9. The results of the analysis of added value in processing soybeans into soybean secondary products by the Hayami Method

Variable	Score			
	Tempeh	Tofu	Soy Milk	Tempeh Chips
Output, Input, Price				
1 A. Output (Kg)	54	18	75	8
2 B. Input (Kg)	45	15	5	5
3 C. Labor (HOK)	6	6	6	6
4 D. Conversion Factor	1,2	1,2	1,5	1,6
5 E. Labor Coev (HOK/Kg)	0,13	0,4	1,2	1,2
6 F. Output Price (IDR/Kg)	20.000	32.000	6.000	54.000
7 G. Salary (IDR/HOK)	40.000	40.000	40.000	40.000
Income and Profit (IDR/Raw Materials)				
8 H. Raw Materials Price(Rp / kg)	8.500	8.500	8.500	8.500
9 I. Other Inputs (Rp / kg)	2.666,67	8.000	24.000	24.000
10 J. Output Value (Rp / kg)	24.000	38.400	90.000	86.400
11 K. Value Added (Rp / kg)	12.833,33	21.900	57.500	53.900
L. Value Added Ratio (%)	53,47	57,03	63,89	62,38
12 M. Labor Income (Rp / Kg)	5.333,33	16.000	48.000	48.000
N. Share of Labor (%)	41,55	73,05	83,47	89,05
13 O. Benefits (Rp / kg)	7.500	5.900	9.500	5.900
P. Rate of Profit (%)	31,25	15,36	10,55	6,82
Owner of the Factors of Production Remuneration				
14 Q. Margin (Rp/Kg)	15.500	29.900	81.500	77.900
R. Labor (%)	34,40	53,51	58,89	61,61
S. Asset (Other Input Donations) (%)	17,20	26,75	29,44	30,80
T. Profit (%)	48,38	19,73	11,65	7,57

From the industrial products that have been analyzed for added value, the amount of margin distributed to labor compared to the profits received by the industry at the research location shows that in soybean processing activities, namely in producing soy products, is a labor-intensive activity that requires more human labor so these activities can open up employment opportunities for residents around the study site. The industries in the research location on average obtain soybean raw materials at a price of IDR. 8,500, whereas if farmers sell to traders, they will get a lower price of around IDR. 6,660 up to IDR. 7,250, depending on the level of the collector. If farmers are directly involved in processing soybeans, farmers will get far greater benefits and can improve their welfare. This can be proven from the level of benefits obtained by the activity of added value of soybeans into tempeh, tofu, soy milk and tempeh chips which reached 31.25% for tempeh.

CONCLUSION

Based on the results and discussion presented previously, it can be concluded as follows:

1. As a whole the soybean supply chain in Grobogan Regency is running smoothly with already having clear targets, a good chain link structure, the existence of management application, and business processes that have been running well. However, there are still obstacles, namely the supply chain resources, especially on capital resources and human resources. Capital constraints are found in supply chain members, namely soybean farmers and village level collectors, while human resource constraints are faced by soybean farmers.
2. Until now, most of the actors in the soybean supply chain in Grobogan Regency have only carried out drying activities on soybeans and a small portion of them have done fermentation to soybeans to increase the selling price of soybeans.
3. The soybean supply chain in Grobogan Regency consists of four channels based on the actors involved in it. The soybean marketing channel pattern in Grobogan Regency are as follow:

- a. Pattern One: soybean farmers-Village level collectors-Sub-district level collectors-Large traders (intermediate consumers).
 - b. Pattern Two: soybean farmers-Village level collectors-Regency level collectors-Large traders (intermediate consumers).
 - c. Pattern Three: soybean farmers-Sub-district level collectors-Large traders (intermediate consumers).
 - d. Pattern Four: soybean farmers-Regency level collectors-Large traders (intermediate consumers).
- Judging from the marketing margin, farmer's share, also profit and cost ratio, channel four is more efficient than other channels.
4. Factors that significantly influence the decision making of soybean farmers to choose soybean marketing channels are farmer knowledge, number of sales (yields) and selling prices.
 5. The added value of tempe products is IDR. 12,8333.33/kg of soybean, tofu about IDR. 21,900/kg of soybean, soybean milk by 57,500/kg and tempe chips around IDR. 53,900/kg which means that all processed soybean products produced by industries at the research location in Grobogan Regency can increase the income of business operators. This also has an effect on increasing the income of

soybean farmers with conditions of market certainty, easy to adopt appropriate technology, availability of raw materials, and supporting human resources.

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