Analysis of Supply Chain Management Soybean (*Glycine max L. Merr*) Based on Quality and Structure Logistics Cost

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ABSTRACT

Supply chain management ~~to~~ minimize the risk of product damage and delays up to tier products. This ~~yg~~study is aimed to determine the level of quality in each tier based on quality parameters and identify the structure of the logistics costs of logistics activity. The method ~~is~~ used convenience sampling through in depth interview about supply chain soybeans. The results showed a dominant logistics costs in material handling activities are 77.73 % and 19.20% of the total transportation logistic costs. Quality of soybeans in tier consumers showed that the water content of 11.4 %, 34.9% protein, size (0.4438 ± 0.0214) 10-4 m^2, color L 56.053, a 4.833 and b 19.87 and texture: 96.16 N/mm 3:08. Efficient supply chain strategy is expected to reduce risk the damage to the product.

Keywords: nutrition, quality, soybeans, supply chain

1. INTRODUCTION

Soybean (*Glicine max*) is a food commodities as raw materials for the food of the people because is being a healthy source of vegetable protein, is also known as cheap and affordable by most people of Indonesia. Soybean production declined sharply since 1992 until today, from 1.87 million tons to only about 700 thousand tons. Decline in production due to lower soybean harvest area due to the competitiveness / soybean prices are far less profitable than its competitors commodity crops, such as corn. Because a consumption soybean to increase so that soybean imports increased. Currently, Indonesia has one of the largest soybean importer in the world. Every year the number of imported soybean average of over 1 million tons of the total average of over 2 million tons (Anonymous, 2013). Processed soy products, among others, tempeh, tofu, tauco, soybean milk and others. Soybean self-sufficiency is a government program that will be achieved in 2017. The compliance efforts including through the development of soybean seed production in soybean production centers, improvement of post-harvest management to improve the quality of soybean yield and policy support. The purchase price of soybeans at the Farmers (HBP) and Security market by Bulog (the Ministry of Agriculture of Indonesia, 2015)

2. GOAL RESEARCH

This aims of this study is encourage self-sufficiency efforts, especially in the soybean supply chain management. In general, business actors in soy trade system can be classified into several , namely ; farmers , traders (village level - up urban areas) , middlemen traders / wholesalers , cooperative , logistic agency in Indonesia , distributors , importers and retailers . Here are the soybean supply chain actors:
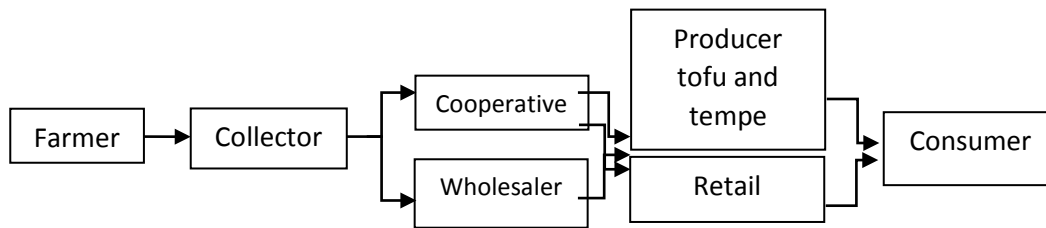
Figure 1. Soybean Supply Chain (2014)

Farmer's role as supplier of initial (initial supplier) in the soy supply chain activities. Activity farmers start of activities in the field (on-farm), postharvest activities (postharvest) to shipping activity.

Objective research in field spesific goal research :
1) To determine the level of quality in each tier based on quality parameters
2) To identify the structure logistics costs from logistics activity.

This research is using convenience sampling through indepth interview about supply chain soybeans
Object Area Research : Central Java, East Java and Yogyakarta

3. IDENTIFIED SUCCESS FACTORS

Soybean consumption in Indonesia reached 2.2 million tons per year ; of that number about 1.6 million tons must diimpor.75 % of that amount imported by the five importers , PT Gate Cahaya Utama, PT Teluk Intan , PT Gunung Sewu, PT Cargill Indonesia, dan PT Sekawan Makmur Bersama (Iswara,2010). This Figure 2 is Soybean Impor from USA :

Figure 2 Soybean Imports

Figure 3. Soybean Varieties Grobogan

4. RESULTS

Soybean Varieties Grobogan is better from Soybean import from proximat test. This table 1 is the test results proximate to a local soybean and soybean imports

Table 1. Proximate test results imports of soybean and soybean origin Grobogan local

Sampel	Soybean Varieties Grobogan	Soybean Imports
Water (% wb)	13.88	11.43
Ash (% wb)	8.70	12.74
Lemak/Fat (% wb)	15.25	14.31
Protein (fk:6,25)	33.90	31.93

Sumber : Primary Source (2014)

Based on the results of testing the quality of soybeans , it is known that local soybean quality is better than imported soybean , especially for acceptance in the processing industry and tofu . The use of imported soybean motivated limited supply of the local soybean. In fact, in terms of quality of the final product, more local soybean providing good quality flavor , texture better and more advantageous in terms of cost .

Table 2. Size soybean from each tier soybean supply chain

No	Tier	Size
1	Farmer	$(0.5884 \pm 0.0214).10^{-4} m^2$
2	Collector	$(0.4995 \pm 0.0061).10^{-4} m^2$
3	Wholesaler	$(0.4416 \pm 0.0039).10^{-4} m^2$
4	Cooperative	$(0.4913 \pm 0.0050).10^{-4} m^2$
5	Retailer	$(0.4416 \pm 0.0039).10^{-4} m^2$
6	Producer/Industrial Tempe & Tofu	$(0.4438 \pm 0.0214).10^{-4} m^2$

Sumber : Primary Source (2015)

Table 3. Average soybean from each tier soybean supply chain

No	Tier	Average	
1	Farmer	175.03 N	1.47 mm
2	Collector	115.76 N	2.18 mm
3	Wholesaler	111 N	2.10 mm
4	Cooperation	112.43 N	1.93 mm
5	Retailer	116.33 N	2.16 mm
6	Tempe & Tofu industry	96.63 N	2.36 mm

Sumber : Primary Source (2015)

Table 4. Color soybean from each tier soybean supply chain

No	Tier	Rata-rata		
		L	a	b
1	Farmer	59.156	2.976	23.78
2	Collector	58.84	4.567	21.073
3	Wholesaler	57.433	3.8	20.8
4	Cooperative	57.876	5.967	23.27
5	Retailer	57.33	4.36	19.01
6	Tempe & Tofu industry	56.053	4.833	19.87

Sumber : Primary Source (2015)

Table 5. Structure Cost Logistic Soybean

Activity	Komponen Biaya	Mean	Mean logistics proportion (%)
Procurement	1. Transportation Cost	36,76	2,06
	2. Communication Cost	5,95	0,33
	Total	42,71	2,39
Material Handling	1. On Farm	1118,92	62,62
	2. Post Harvest Cost	229,97	12,87
	3. Inspection Cost	28,41	1,59
	4. Depresiation Cost	6,85	0,38
	5. Loss during Maintenance	4,66	0,26
	Total	1388,81	**77,73**
Maintenance	1. Equipment Cost	1,38	0,08
	2. Maintenance Car Transport Cost	1,45	0,08
	Total	2,83	0,16
Inventory	Holding cost	3,36	0,19
Transportation	1. Transfer Fee	41,72	2,34
	2. Depresiation	90,23	5,05
	3. Loss during delivery	212,21	11,88
	Total	344,17	19,26
Information	Communication	4,84	0,27
	TOTAL	**1786,71**	**100**

Parameter Quality Product consist of water content, protein, Size, Colour (where is the result?)and Texture
Tools & Method :

- Protein test using Kjeldahl method

- Water Content test using Thermogravimetri method
- Size test using Vernier Caliper

Texture test using Universal Testing Machine (UTM)

The results showed a dominant logistics costs in material handling activities are 77.73 % and 19.20% of the total transportation logistic costs.

CONCLUSSION

1. Efficient strategy Supply Chain in inventory for each tier make to cost efficient.
2. A manage for quality for each tier can to reduce risk the damage to the product .
3. A choice supplier based on cost and quality

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