VALUE ADDED ANALYSIS OF SWEET POTATO CHIPS PROCESSING IN JEMBER REGENCY

A Brilliantina[1], E K Novitasari[1*] , B Y Pratiwi[2] and I R A Sasmita[1]

[1]Department of Food Industry, State Polytechnic of Jember Mastrip Street PO BOX 164 Jember, Indonesia
[2]Department of Agribusiness Management, State Polytechnic of Jember Mastrip Street PO BOX 164 Jember, Indonesia

E-mail: elok_kurnia@polije.ac.id

Abstract. The Food security has become an important issue in Indonesia. One of the processing industries that can support food security is the sweet potato industry. The purpose of this study is to calculate the added value of sweet potato chips. Data acquisition in this study was obtained by observation and interviews. The study was conducted in April-July 2019. This study is using descriptive data analysis method to describe the processing of sweet potatoes into sweet potato chips. In this study also used quantitative analysis to determine the added value of sweet potato by using Hayami method. The results of this study are expected to encourage the development agroindustry based on local commodity, especially sweet potatoes, to support food security. **Keywords:** sweet potato, added value, hayami method

1. Introduction

The great number of agro industries in Indonesia which reached 26.14 millions proves that the agroindustry sector plays an important role in improving the economic level of Indonesian [1]. The large number of Indonesian who make a living as farmers is supported by the diversity of agricultural products in Indonesia, increasing the opportunities of community in efforts to develop the agroindustry sector in Indonesia. The diversity of agroindustry sector in Indonesia includes the rice food sub-sector and the food crops sub-sector. One of the food crops that has relatively large potential is sweet potato.

East Java Province as part of Indonesia's territory has large potential natural resources to support the development of agroindustry. One of agroindustry product that can be developed is sweet potato-based agroindustry. The detail of harvest area, production and productivity of sweet potatoes in East Java Province can be seen in Table 1.

One of East Java regencies that potential for the development of sweet potato-based agroindustry is Jember Regency. Jember Regency has 78,815 ha of agriculture land. Agricultural area used to grow sweet potatoes is 1480 ha. Sweet potato-based agroindustry is expected to increase the acquisition of added value for its use. In line with this, the research objective is to find out the value added obtained from the processing of sweet potato chip.

---

[1] To whom any correspondence should be addressed.

Table 1. Harvest Area, Production and Productivity of Sweet Potatoes in East Java Province

Year	Harvest Area (Ha)	Productivity (Kw/Ha)	Production (Ton)
2012	14 264	288,81	411 957
2013	19 139	205,44	393 199
2014	13 483	231,71	312 421
2015	12 782	274,23	350 516
2016	10 569	272,53	288 039
2017	10 028	256,70	257 414

Source: Agriculture Department of East Java Province (2018)

2.   Literature Review

According to [9], added value is the additional value of a commodity to undergo processing, transportation, or storage in a production. In processing process, value added can be defined as the difference between product value with the cost of raw materials and other inputs, excluding the labor. Meanwhile, the margin is the difference between the product value and the price of raw materials. This margin includes the component of production factors used, which are labor, other inputs and the remuneration of processing entrepreneurs/ processor ([3]; [5]; [7]; [8])

Changes in raw materials value of that have undergone processing treatment can be estimated. Thus, on the basis of added value obtained, margins can be calculated and subsequently rewards for factors of production can be known [4]. Other factors of production are other inputs: depreciation, raw materials, supporting materials and others are calculated on the basis of their use.

3.   Research Methods

Lack of community understanding, especially farmers in Jember, related to the added value generated from the processing of agricultural products into other products, causing many farmers unwilling to process agricultural products and tend to sell them directly in a raw state. Therefore it is necessary analyze the added value to identify the additional value generated in each link [6].

This research was conducted in Kemundungan Village, Panti District, Jember Regency, East Java. Sampling was done by simple random sampling, where the total population of sweet potato farmers located in the village of Kemundungan many as 147 KK (Head of Family), and for the samples taken 35 families. The data collected in this study consisted of primary data and secondary data. The hypothesis was analyzed descriptively by knowing several factors that explain the reason farmers sell sweet potato. For hypothesis it is analyzed using the Hayami Method. Analysis using the Hayami Method can be seen in the following Table 2.

Table 2. Components of Value Added Calculation

No	Variable	Value	
	Output, Input, and Price		
1	Output (kg)	OP	
2	Input (kg)	IP	
3	Labor (kg)	LB	
4	conversion factor	FKO	OP/IP
5	Employee coefficient (Hok/kg)	KTK	LB/IP
6	Output price	HO	
7	Average employee earning (Rp/Hok)	UP	

	Income and Benefit		
8	Raw materials Prices (Rp/kg)	HBB	
9	Other input (Rp/kg)	IPL	
10	Output value (Rp/kg)	NO	FTO*HO
11	a. Added value (rp/kg)	NT	NO-IPL-HBB
	b. Added value ratio (%)	RNT	(NT/NO) x 100
12	a. Employee earning (Rp/kg)	RTK	KTK x UP
	b. Share of employee (%)	PTK	(RTK/NT) x 100
13	a. Profit (Rp/kg)	PFT	NT – RTK
	b. Profit rate (%)	TPF	(PFT/NT) x 100
	Remuneration to the Factor Production Service Owner		
14	Margin (Rp/kg)	MR	NO – HBB
	a. Employee income (%)	MTK	(RTK/MR) x 100
	b. Other input contribution (%)	MIL	(IPL/MR) x 100
	c. Profit (%)	MP	(PFT/MR) x 100

Source: Hayami et al., 1987

The data needed in added value analysis is obtained through an interview process in the form of questionnaire, where the data depends on each chain of respondent. In the farmer chain, data taken such as the number of seedlings planted, how much the price of fertilizer is, the yield of sweet potatoes obtained in one harvest and so on. While in the sweet potato processing chain the data taken includes the amount of raw materials, the price of raw materials, how much is the total production, the selling price of the product and so on. Finally in the retailer chain the data needed is related to the number of products taken from the manufacturer, the original price of the product, the total product sold and how much the selling price of each product is.

4. Results And Discussion

4.1 Hayami Added Value Analysis

Added value analysis of sweet potato chips processing is carried out using the Hayami method. The analysis results of the added value of sweet potato chips agroindustry can be seen in table 3.

Table 3. Calculation of the average added value of sweet potato chips agroindustry per production process in the period of April-July 2019

No	Variable	Value
	Output, Input, and Price	
1	Output (kg)	39,03
2	Input (kg)	94,06
3	Labor (kg)	8
4	conversion factor	0,41
5	Employee coefficient (Hok/kg)	0,085
6	Output price	40000
7	Average employee earning (Rp/Hok)	15000
	Income and Benefit	
8	Raw materials Prices (Rp/kg)	1500
9	Other input (Rp/kg)	5012,82
10	Output value (Rp/kg)	16400
11	a. Added value (rp/kg)	9887,18
	b. Added value ratio (%)	60,28
12	a. Employee earning (Rp/kg)	1275
	b. Share of employee (%)	12,89
13	a. Profit (Rp/kg)	8612,18

	b. Profit rate (%)	87,1
	Remuneration to the Factor Production Service Owner	
14	Margin (Rp/kg)	14900
	a. Employee income (%)	8,55
	b. Other input contribution (%)	33,64
	c. Profit (%)	57,79

Source: Primary Data from Research field, 2019

Table 3 informs that the average added value obtained by sweet potato chip agroindustry of each kilogram of sweet potato raw material into sweet potato chips is Rp.9,887.18. this means that a kilogram of sweet potato raw material used can provide added value of Rp. 9,877.18. Added value ratio is used to measure the progress achieved in the field of productivity of an agroindustry that involves the additional value of its product. The ratio value is obtained from added value formation components of Hayami Method. This ratio will be calculated and analyzed, which are the ratio of added value per employee and profit per added value. Calculation of added value ratio for each production process in the sweet potato chip agroindustry from April to July 2019 can be seen in Table 4 below.

Table 4. Average of Added Value Ratio in Sweet Potato Chips Agroindustry from April to July 2019

No	Componen	Unit	Value
1	Added Value / Labor Ratio	Rp/TK	2.411,5
2	Added Value / Output Ratio	%	24,71
3	Added Value Ratio / Labor costs	Rp	0,66
4	Profit / added value	%	87,1

Source: Primary Data from Research field, 2019

4.2 Value Added in Supply Chain of Sweet Potato Chips Processing

The chain model contained in sweet potato chips processing consists of 5 networks, namely a network of sweet potato farmer, middleman, a network of sweet potato chips processing unit, a network of small traders or retailers and a consumer network. The sweet potato processing supply chain that will be analyzed can be seen in Figure 1.
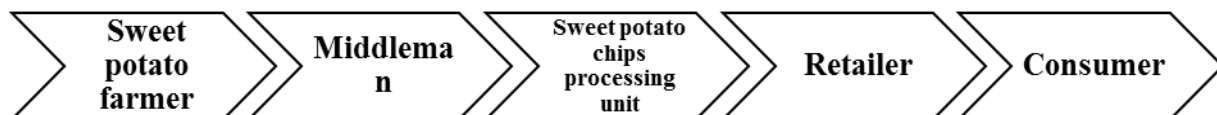
Figure 1. Supply chain of sweet potato chips processing

The first network analyzed is acting as a supplier in the supply chain of middleman, namely middleman. The second network analyzed is acting as a supplier in the supply chain of sweet potato chips processing, namely middleman. Furthermore, the main network in the supply chain for sweet potato chips processing is the sweet potato chips processing network. The fourth network analyzed in the supply chain is the small traders or retailers.

Added value analysis of the supply chain of sweet potato chips processing is carried out using the Hayami method. The analysis results of the added value of sweet potato chips agroindustry can be seen in table 5.

Table 5. The average difference in production of sweet potato per ha

No	Cost type	Supply chain of sweet potato chips processing			
		Farmer	Middleman	Unit processisng	Retailer
1	Value Input	500	1500	4000	10000
3	Other input	275	500	3500	-
4	Output	1500	4000	10000	12000
5	Added value	725	2000	2500	2000
	Added value ratio (%)	48	50	29	20
6	Employee earning	500	-	1000	-
7	Profit	225	2000	1500	2000
	Profit rate (%)	**15**	**50**	**17**	**20**

Source: Primary Data from Research field, 2019

The results in Table 5 show that added value analysis of sweet potato chips agroindustry in a row is 48% for farmer, 50% for middleman, 29% for unit processing, and 20% for retailer. The highest profit rate added value of sweet potato chips agroindustry is the middleman, because the middleman.

4. Conclusion

The conclusions obtained from the results of this study that the value chain system is not effective because they had a middleman. Middleman had the highest profit until 50% in supply chain of sweet potato chips processing. The farmers are still in the lowest bargaining position as indicated by the low profit rate. Profit rate of the farmer can be increased by product processing training and also provides for farmers to be able to sell their products without middlemen.

References

[1] BPS. 2018. Indonesia dalam Angka Tahun 2017. www.BPS.go.id

[2] Deptan. 2018. Departemen Pertanian Provinsi Jawa Timur. www.deptan.go.id

[3] Dwihandini, D. 2003. Nilai Tambah Pengolahan Keripik Pisang (Studi Kasus). Skripsi. FP-UMB., Jakarta

[4] Hayami, Y., M. Thosinori, dan M. Siregar. 1987. Agricultutal Marketing and Processing in Upland Java: A Prospectif from A Sunda Village, Bogor. The CPGRT Centre

[5] Mulyana. 1999. Analisis Nilai Tambah Pengolahan dan Pemasaran Keripik Ubi Kayu (Studi Kasus). Skripsi. FP-UMB., Jakarta

[6] Muzakki, M. 2012, Optimalisasi Keuntungan Pada Perusahaan Kripik Balado Mahkota dengan Metode Simpleks, Jurnal Matematika UNAND, Vol 1 No.1, Oktober 2012, ISSN 2303-2910, Universitas Andalas Padang.

[7] Septiyani. 2003. Nilai Tambah Produk Olahannya (Studi Kasus). Skripsi. FP-UMB., Jakarta

[8] Slamet, U. U. 2005. Nilai Tambah dan Balas Jasa Faktor Produksi Pengolahan Hasil-Hasil Pertanian. Buletin Penelitian No. 08: 1-8

[9] Suprapto, A. 1999. Pengembangan Agribisnis Komoditas Unggulan dalam Memasuki Pasar Global. Makalah disampaikan dalam Lokarya Nasional dan Musyawarah Nasional V POPMASEPI di Medan. 16 Maret 1999. Medan

Acknowledgements