Has The sweet pepper value chain benefitted farmers? a case study in Pasuruan Regency, Indonesia

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Abstract. Sweet pepper farmers in Indonesia produce such a potential amount that contributes to the need of export and domestic demands. The high potency of sweet pepper development can be supported by farmers in Pasuruan, East Java. However, they are still in a low level of welfare as they always get the lowest income in every agricultural commodity value chain activities. This study aimed to understand: 1) feasibility analysis by farmers, 2) actors involved in sweet paper chain activities; and 3) its value chain analysis. The sampling technique used was non-probability approach with purposive method. Primary data was obtained by interviewing value chain actors. Data analysis was carried out in descriptive quantitative to analyze the costs and revenues of farming, to describe the value chain that was formed and to count the added value by using Hayami Method. The feasibility analysis showed that sweet pepper conducted by farmer in Pasuruan is feasible. There were 6 value chains which actors are farmers, middleman, wholesaler, retailer, collector, and consumers. Most respondent did 2 types of chain and among all of them, the biggest added value added was provided by farmers.

1. Introduction

Income gap in an area is a real problem, thus discussion of the value chain is important. The value chain includes complex activities carried out by various business actors, such as producers, processors, traders, and service providers to bring products through a chain to the final consumer by adding value [1]. Value chains can be formed in sectors involving various actors, like in the agricultural sector.

Many farmers depend on the agricultural sector for their livelihoods, and possibly they become victims of the low income earned in a value chain. In fact, according to [5] until now, most Indonesian farmers are still in the underprivileged category because they often receive the lowest income share in a value chain. It happened in vegetable commodity value chain in Karo District. Cabbage farmers earned 118% lower income compared to the final traders who sell cabbage to consumers [2]. Not only for vegetable commodities, but it also happen to fruit commodities such as sweet peppers.

Sweet pepper is an important product and highly potential to be developed. The demand for sweet peppers does not only come domestically, but also internationally. It is no wonder that sweet pepper production in Indonesia has increased over the past three years [7]. The production of sweet pepper in Indonesia from 2016 to 2018 was 5,265, 7,390, and 18,151 ton. A significant change occurred in 2017 to 2018 that was an increase in production more than 100%. Moreover, the sweet pepper commodity is also potentially developed because its production is still concentrated in several provinces, such as Bali, West Java and East Java [2].

This research was conducted in Pasuruan Regency as one of the sweet pepper production centers in
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East Java, and there is no research on sweet pepper value chain in that location. This study is different from previous studies on the sweet pepper commodity and its value chain. Several previous studies examined sweet pepper by analyzing uptake and access to business financing for the application of technology to sweet pepper in Bali and Bandung. Whereas the average previous research related to the value chain only analyzed the value chain focusing on a company that provides added value to the products sold.

Based on this, the authors are interested in carrying out research related to the value chain formed in the marketing of sweet pepper commodity in Pasuruan Regency. The purpose of this study was to determine whether the income distribution of the actors in the sweet pepper value chain with high economic value was in accordance with the costs and added value incurred by each actor or not. Hopefully, by conducting this research, it can be seen if the value chain formed is a value chain that is in favor of farmers.

2. Method
This research was conducted from November 2019 to June 2020. The sweet pepper commodity in this study was only grade A and B of green, red and yellow peppers. The sampling technique used was non-probability sampling approach with purposive method. Sample in this study was 8 respondents, consisting farmers, collectors, wholesaler and processor. The type of data used in this study was primary data that obtained by interviews. Data analysis was carried out in a descriptive quantitative to determine the value chain of sweet pepper by analyzing the costs and profit of the actors [6], by the following formula:

\[ \pi = TR - TC \]
\[ \pi = (P \times Q) - (TFC + TVC) \]

Meanwhile, to determine the added value provided by each value chain actor, it was analyzed using the Hayami method [3,4].

3. Result
3.1. Farming Analysis of Sweet pepper (by farmers)
Farm revenue in this analysis was revenue that directly obtained in the form of cash from the sale of peppers. Non-cash receipts were not included in the analysis on the basis that all of the sweet pepper harvested by the respondent was sold directly and nothing was stored for household consumption or used for seed. Revenue from sweet pepper farming was calculated from the multiplication of the amount of sweet pepper produced during a planting period and the average selling price received by farmers. The average amount of sweet pepper production at the study sites during the last planting season was 4,400 kg per 400 m². The selling price of red, yellow and green peppers was used an average price of IDR 36,000/kg. Thus the cash receipts as well as the total revenue that the respondent farmers got from selling peppers in one growing season is IDR 366,493.33 per 400 m².

Sweet pepper farming costs were all cost components incurred by farmers in running a sweet pepper farming business. Total cost incurred consisted of cash costs and non-cash costs of IDR 146,232,000. The total profit from farming sweet pepper was IDR 220,261,333, -/year/farmer. The income of this sweet pepper farming was sufficient because It could pay all the costs of purchasing production facilities, including all administrative cost components attached to the purchase. Based on Revenue/Cost Analysis it can be seen that the business was feasible with the amount of 2,5 (R/C>1).

| Tabel 1. Average Revenue Cost Analysis of Sweet pepper | Value ( IDR) |
|-------------------------------------------------------|--------------|
| Unit                                                  |              |
| Total Revenue                                         | 366,493,333  |
| Fixed cost                                            | 40,750,000   |
| Variable cost                                         | 105,482,000  |
| Total Cost                                            | 146,232,000  |
3.2. Value Chain Mapping

There are 6 value chain actors. The six actors are mapped based on the core process they carry out to form 6 different value chains in sweet pepper marketing. Starting from farmers as producers of fresh peppers who carry out the core production process, collectors who collect and distribute peppers, wholesalers who distribute products from collectors, processors who make sweet pepper chips and retailers who sell peppers in small quantities until finally sweet pepper right down to the consumer.

![Figure 1. Mapping of Primary Process and Sweet Pepper Value Chain](image)

Based on Figure 1, Sweet pepper mapping resulted in its supply chain. Some of the supply chain were as follows:

- **Chain 1**: farmer – collector - consumer
- **Chain 2**: farmer – collector – retailer - consumer
- **Chain 3**: farmer – collector – wholesaler - consumer
- **Chain 4**: farmer – collector – chip processor - consumer
- **Chain 5**: farmers – collectors – wholesaler – retailer - consumers
- **Chain 6**: farmers – collectors – wholesaler – retailer - consumers (out town seller and hotels)

3.3. Value Added in Each Actors

This research has limitation to 2 type of value chain represents simple (short) and complex (longer) value chain. Simple value chain involved the first chain (farmer-collector-consumer), and second type of value chain involved the fifth value chain (farmers – collectors – wholesaler – retailer – consumers). The average quantity of peppers distributed in this chain for 1 year is 10,080 kg green peppers, 2,880 kg red peppers, and 1,440 kg yellow peppers. The selling quantity of peppers varies with each type of color with the highest was green peppers [2]. The difference in the sales quantity of peppers affects the costs and benefits obtained by each actor. The following is the profit/income table of chains. It can be seen that farmers has higher value added than collector in type 1 in every kind of pepper (green, red and yellow).
Figure 2. Value added for chain 1 (farmers-collector-consumers)

Figure 3. Value added for chain 5 (farmers-collectors-wholesaler-retailer-consumers)

Type 5 value chains represents longer chain with more actors involved than type 1. The quantity of peppers being sold was also much more, but income derived from green peppers sales are still the highest compared to red and yellow peppers. In this value chain, the average quantity of sweet pepper sold for 1 year is 46,430 kg green peppers, 10,150 kg red peppers, and 2,760 kg yellow peppers. Figure 2 shows that in short value chain, the income was level up for farmers if it was compared with collector at any kind of color. In a more complex value chain farmers also experienced the highest income especially for red and yellow pepper. Farmers had the highest added value because they carry out the cultivation process from seeds to become a ready-for-sale fruit. This findings was seen in Figure 3, in a complex value chain, green pepper contributes higher income to wholesaler. This means that in a more complex value chain, producing red and yellow pepper is more benefitted for farmer. When it came to a number and how many rupiahs of the value added, we could see that mostly farmer provided an added value of IDR 15,934/kg, collectors of IDR 4,218/kg, wholesalers of IDR 14,082/kg, retailers at Karangploso Market and Pasar Besar was IDR 5,936/kg and IDR 4,967/kg, as well as processors provide added value of IDR 14,089/kg

3.4 Implication
Based on the analysis, it can be seen that the value of this sweet pepper farming was very high, reaching IDR 93,013,000 per planting. Therefore, Business opportunity of this commodity is still very big,
especially for green peppers. The findings also mentioned that the number of actors involved in sweet pepper farming was 6, and still has the opportunity to increase because the limitations of this research is for Pasuruan district needs. The chains were divided into simple and complex. The longer the chain was, the more complex the value added would be. In this findings, 2 types of value chain as mentioned in figure 2 and 3 were the most value chain carried out by farmers based on interviews. The very large income in this farming happened because this field of farming is lack of business player, in Pasuruan for example, farmers are more interested in planting rice and other staple food. Beside that, pepper in Indonesia is also not yet popular. It is open opportunity for developing any recipe with paprika as the ingredients because it is actually also part of Indonesia’s most promising horticulture in the future.

Therefore, there are several things that must be considered by the government in order to motivate sweet pepper farmers in doing business. For further researchers, value chain analysis can be more focused on processed sweet pepper products. It is very important to build synergy between actors, these are farmers and wholesalers, in order to maintain good relations with other actors by always selling products according to the appropriate demand and quality. Then, collectors and processors may collaborate to create mutually beneficial relationships.

4. Conclusion
It is concluded that the farming business of sweet paper was feasible with R/C Ratio of 2.5 at any color. There were 6 types of value chain that involved 6 actors such as farmers, collectors, wholesalers, processors, and retailers, consumers. The activity carried out in value chain has mostly provided more benefits to farmers as it can be seen in both in simple value chain (farmers-collectors-consumers) and also complex value chain (farmers-collector-wholesaler-retailers-consumers).

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6. References
[1] ACIAR 2012 Membuat Rantai Nilai Lebih Berpihak Pada Kaum Miskin: Buku Pegangan Bagi Praktisi Analisis Rantai Nilai. Agricultural Development International.
[2] Arsanti I W, Sayekti A L, & Kiloes A M 2017 Analisis Rantai Nilai Komoditas Kubis (Brassica oleracea L): Studi Kasus di Sentra Produksi Kabupaten Karo (Value Chain Analysis of Cabbages: Case Study in Karo District Production Centre). Pusat Penelitian Dan Pengembangan Hortikultura, 2 269–278.
[3] Hayami Y, Kawagoe T, Morooka Y, & Siregar M 1987 Agricultural Marketing and Processing in Upland Java A Perspective From A Sunda Village.
[4] Luhur E S, & Yusuf R 2017 Analisis Rantai Nilai Ikan Cakalang Di Kota Ambon, Maluku. Jurnal Sosial Ekonomi Kelautan Dan Perikanan. 12 1 93-95
[5] Sobari E 2015 Budidaya Sweet pepper (1st ed.). Yogyakarta: Graha Ilmu.
[6] Suratiah K 2015 Ilmu Usahatani. Jakarta
[7] Suryadi D, Megawati A, Susilo B, Nurullah Dalimarthla L, Chandra Wiguna E., Pertwi Koentjoro M, & Nugroho Prasetiyo E 2017 Model Manajemen Terpadu Pertanian Hortikultura Organik pada Lahan Sempit Integrated Management Model of Organic Horticulture for Narrow Land Plantation. Proceeding Biology Education Conference. 14 1 118–125.