The Value Chain Analysis and Strategies for the Development of Ginger Farming in Semarang Regency

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Abstract

Ginger is a biopharmaceutical commodity which has a high economic value. However, a long ginger trading system makes the position of farmers as the producer have low bargaining power. The purpose of this research was to analyze the value chain and develop strategies for increasing ginger commodities in Semarang Regency. The method used in this research was quantitative descriptive using primary data with the number of respondents as many as 98 ginger farmers, 2 collectors, 2 wholesalers, 2 retailers and 6 key persons. The variables in this research included value chains, marketing margins, cultivation, post-harvest, marketing, institutions and policies. The analysis tools used were Value Chain Analysis and Analytic Hierarchy Process (AHP). The results showed that (1) Ginger farming in Semarang Regency was profitable with an average production or r/c ratio of 5,1. (2) There were three patterns of ginger trading in Semarang Regency, and their selection depended on the amount of production, transportation, facilities and capabilities owned by farmers. (3) The most prioritized criteria in the strategy of developing ginger farming in Semarang Regency covered marketing, cultivation, policy, harvesting and institutional aspects. Regarding these findings, suggestions or recommendations are given as follows: (1) carrying out harvesting process such as ginger powder independently. (2) forming ginger farmer groups to shorten the marketing chain of ginger, and increase the income of ginger farmers. (3) performing innovative digital marketing strategies.

Keywords: Value Chain, Analytical Hierarchy Process, Ginger Farming
JEL Classification: (based on JEL classification system)

1. Introduction

Ginger (Zingiber officinale) is a member of the Zhingibaraceae family of plants. The plant is native to Asia, but now is cultivated in West Indies, Africa, India, and other tropical regions (Singletary, 2010). Ginger is a rhizome commonly consumed as a delicacy, medicine or spice. It is considered as a safe spice with several medicinal properties (Yusuf et al, 2018). Ginger has a long history of medication use for 2500 years in China and India (Grant & Lutz, 2000); (Yilmaz et al, 2018). Ginger is also a spice that is widely consumed throughout the world and contains an excellent source of phenolic compounds including gingerol, shogaol, paradol, gingerdiones, etc.

(Mukkavilli, et al., 2018). According to Siagian (2014), Ginger is one of medicinal plants needed in large amounts for small industry of traditional medicine and traditional medicine industries. Traditional treatment systems are still used by around 75-80% of the world's population for primary health care (Majaz & Khurshid, 2016). Sukarman & Melati (2011) in Azizah et al (2019) explain that ginger can grow optimally in areas with climate type A, B, and C, at altitude 300 - 900 meters above sea level with 7-9 wet month per year, rainfall 2,500 - 4,000 mm per year and light intensity of 70-100% or a little shaded to open.

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/ 9/2006 states that there are 66 species of medicinal plants cultivated in Indonesia and 5 types of medicinal plants that have the highest production, namely ginger, turmeric, galangal, *kencur* or aromatic ginger and *lempuyang* or bitter ginger (Salim & Munadi, 2017), The role of ginger commodities to Indonesia's economy is quite important as a source of income for ginger farmers, producers of industrial raw materials, and the provider of employment through processing, marketing and import-exports (Astuti, 2017). According to Bermawie & Purwiyanti (2011) in Azizah, et al (2019) There are three types ginger cultivated in Indonesia, including big white ginger (Z. officinale var. Officinale), small white ginger (Z. officinale var. Amarum), and red ginger (Z. officinale var. Rubrum). These three types of ginger have different morphological character, starch content, fiber content and essential oil. In 2017 the export volume of ginger in Indonesia amounted to 21,030,933.30 tons. Ginger high demand in the global market is due to the demand for the raw material for companies both domestically and abroad (Siagian, 2014). Table 1 explains the large volume of exports and imports of medicinal plants. According to Statistics Indonesia or BPS (2018) ginger production in Indonesia is dominated by Java Island Central Java provinces as it ranked in the second-largest producer of ginger after East Java province which amounted to 45.352.918 kg. Ginger species which are cultivated by farmers in Central Java consist of three types of ginger.

Big ginger has large bulbous physical characteristics and meaty flavor that is not too spicy. This ginger has the physical characteristics of bulbous with a smaller size of ginger, but tastes more spicy than common ginger. Red Ginger has the physical characteristics of small bulbous and red with very spicy flavor. It can be seen in Table 2. Even though the production of the last 3 years of the ginger plant fluctuated, it became the most production compared to other medicinal plants in Central Java.

Semarang regency is one area that has the largest area of ginger land in Central Java with a harvested area of 3.7784 million m² (BPS, 2017), In (Figure 1) the production of ginger in Semarang Regency during the last 5 years was likely to increase. However, in 2017 a decline in production significantly increased during the harvest time. This was due to shifts in the seasons that occurred during 2017 which led to the failure of ginger crop. The uncertainty of this production can threaten farmers' income because the economy depends on the success of the crop growers.

Based on the results of a field survey to Semarang Regency Agricultural Extension Centers (2019) it was found that the fall of the selling price of ginger in 2017 had a psychological influence that farmers tended not to grow ginger in the following year. This made farmers did not plant ginger intensively. Ginger planting is usually done intercropping accompanied by various types of other horticultural crops. Based on this matter, ginger farmers in the Regency of Semarang are turning to other, more profitable commodities. Farmers feel this ginger farming less profitable than other horticultural crops although the owned harvested area is adequate for planting ginger (Preliminary research survey, 2019).

Acreage and production of ginger that fluctuate is very important to note given the need for processed ginger in Indonesia continues to increase every year. Moreover, the Directorate General of Horticulture made Annual Performance Plan targets commodity production as much as 474 800 tons of medicinal plants (Horticulture, 2014), However, in reality the supply of production and harvested area of domestic ginger that fluctuate each year are not matched with the needs of the growing ginger.

Aresearch conducted by Listyana (2016) explains that ginger plant has a good growth rate, but yields insufficient results. Reality has showed that agribusiness medicinal plants do not develop properly and evenly as farmers and entrepreneurs do not understand the needs of domestic and export markets which want ready-made products. This lack of understanding is due to the uneasy selling of medicinal plants and other horticultural crops, such as vegetables or fruits.

Semarang Regency Agricultural Extension Center and the Department of Agriculture and

Fisheries and Food Semarang Regency (2019) states that the non-optimal production of ginger in Semarang Regency is due to the low price of ginger farmers and the long length of the value chain so that ginger production tends to fluctuate. Based on (Figure 2) the price of ginger in Semarang Regency is not the same. This was because the marketing of soaked ginger in each regency was varied.

In addition, based on field survey with ginger farmers in the Regency of Semarang (2019) it was known that wet ginger price in 2017 from farmer was Rp.6.000 / kg, and at a market it turned to Rp.23.000 / Kg. The price differed Rp.17.000 / Kg, whereas the ginger sold was still in the same shape. This was made by actors who played a role in the ginger farming, namely collectors and wholesalers. Low price is one of the important problems faced by farmers, and the government. In addition, the products sold by farmers generally do not have brand and cannot impress the crude product. The characters of agricultural products which are not easy to carry and perishable make them vulnerable to fluctuations and price decline (Prajanti & Setiawan, 2012). In the marketing aspect, farmers as the producers of ginger are considered weak due to the absence of a strong bargaining and a long value chain. Farmers only act as price taker, while its marketing depends only on the collector. Such conditions can be detrimental to farmers because the price increase is only enjoyed by speculators, middlemen and distributors who are in the marketing channels (Prajanti & Setiawan, 2012). With the difference in purchase price and the selling price between farmers and traders, the percentage of profits gained by farmers is getting smaller, while the consumers have to pay the price that is quite expensive.

In line with the above issue, research by Malau & Ayu (2016) discusses the supply chain of ginger in Simalungun. Their research addressed that when the ginger market structure synergy in the region is not well, and farmers lack of information there will occur actual price formation in the market. Therefore, farmers often receive less benefit from the results of farming. Besides, while farmers establish partnership, traders already establish partnerships with wholesalers.

Based on the above problems, it is very important to identify the value chain of activities of actors involved in the chain of business administration from the upstream to downstream of economic benefits of ginger in the ginger farmers, especially in the Regency of Semarang. In addition, further research is also needed on the right strategies for the successful development of ginger agriculture in Semarang Regency. Therefore, this study discussed the value chain of ginger in Semarang Regency as well as the right strategies to develop ginger farming in Semarang Regency.

Based on this background, the first question in this research related to the ginger farming performance in Semarang Regency. The second is the groove pattern of ginger commodity value chains in Semarang Regency. Therefore, the third question is what strategies that can be applied in the development of ginger farming to increase the income of farmers in Semarang Regency.

According to Kotler & Keller (2009), marketing channel is an intermediary group that is closely related with one another in distributing the products to the buyer, particularly being a channeling between producers and consumers. Business success in agriculture highly depends on the expertise in marketing, production, finance, and human resources (Eden, 2010). In farming, profitable marketing by ginger farmers has not occurred because most farmers sold their crops only to the collectors.

According Soekartawi (1995) in Widyastuti, Soejono, & Widjayanthi (2015) to determine whether farming by farmers ginger profitable or not, the analysis of the balance receipts and costs (R / C). can be performed using the following mathematic equation:

$$R/C = TR/TC$$

TR: Total Revenue (USD)
TC: Total cost (US $)

Through this formula, when the results show R / C > 1, it means that the ginger farming is profitable, so it deserves to be continued, while

if R / C < 1, then the cultivation of ginger is not profitable, so it is not eligible to be continued, and if the value of R / C = 1, the farming is at breakeven.

Problems that faced by ginger farmers in Semarang were such as the problem of low prices from farmer, less bargaining position for farmers, and the length of the distribution chain that caused the percentage of profits received by farmers got smaller, while on the other hand consumers must pay prices that were quite expensive. This was evidenced from a field survey with ginger farmers in Semarang Regency (2019) that the price range of wet ginger in 2017 at the farm level was Rp 6000 / kg, while at the market level was Rp 23,000 / kg. The commodity prices between farmers and the market differed Rp.17,000 / kg, while the ginger sold was still the same. From these problems, the researchers concluded that this research needed to be carried out with hope that the results of this study could be used as a reference for realizing efficiency and appropriate development strategies for ginger farming in Semarang Regency.

The initial focus was on the value chain research and performance of individual businesses, but lately it included a broader concept of issues including social benefits, regional and local economic development (Kaplinsky & Morris, 2001). ACIAR (2012) states value chain is a strategic collaboration of various institutions aiming to achieve the objectives of the specific markets in the long term for the benefit of all parties involved in the value chain. No value chain for each member of the chain of products and services adds value through activities that they deem most appropriate, and allows other members to do the same. In ginger farming, the value chain that is created is the intertwined relationship between ginger farmers, traders, wholesalers and retailer where each actor has a different role, but very dependent to each other.

2. Research Methods

This research used descriptive statistics and qualitative research. It used descriptive statistics to determine the value of each actor that plays a role in the value chain and ginger quality for ginger farming and describe possible development strategies in. The data used were primary data and secondary data. The primary data were obtained through interviews to farmers ginger in Semarang Regency as many as 98 respondents, collectors, wholesalers and retailers as many as 6 respondents. In addition, the information was collected from 6 associated figures (key person). Meanwhile, the secondary data were obtained from documents, records, journals and Internet sites owned by the relevant agencies, namely the Ministry of Agriculture, BPS of Central Java Province, Department of Agriculture, Fisheries and Food Semarang Regency. The sampling technique used was snowball sampling and purposive sampling techniques. The snowball sampling technique is used for sampling the value chain. According to Sanusi (2011) snowball sampling technique is a sampling technique which initially uses limited respondents, and continues to increase based on information from the first respondent. Second, purposive sampling technique is used for sampling regarding development strategies. It involved several key persons, consisting of four fields, namely academics, the government, business doers (entrepreneurs), and community or society (Prajanti & Setiawan, 2011). Here, the selected key persons were from the Department of Agriculture and Plantation of Central Java Province, Department of Agriculture, Fisheries and Food of Semarang Regency, Semarang regency *Gapoktan* Chairman, Semarang Regency ginger wholesalers, Semarang Regency Agricultural Extension Center, and Faculty of Economics Universitas Negeri Semarang.

Data collection techniques used in this study were observation, interviews, questionnaires, and documentation. Observation in this study was used to identify and observe the condition of ginger in Semarang Regency. Creswell 2012 in Sugiyono (2013: 197) states, "Observation is the process of gathering firsthand information by observing people and places at research sites". Interviews were conducted to determine the depth of the sales distribution channel of ginger in Semarang Regency along the obstacles that occur from planting to selling ginger. These activities were done to the actors in the ginger

farming ranging from farmers to retailers. Questionnaire was distributed to determine applicable strategies to develop ginger farming in Semarang Regency. This questionnaire was given to key persons in question. What is significant in the composition of the questionnaire is the way the question is formulated, sequence, or character (Ghic et al, 2014). Documentation according to Sugiyono (2015) is a method used to obtain data and information in the form of books, archives, documents, writing numbers and pictures in the form of reports and information that can support research. Documentation was used to find information conditions and problems in the value chain in the form of records, reports, photos from various sources.

The data analysis methods used in this study included the value chain analysis and analytical hierarchy process (AHP). Analysis of the value chain refers to a series of activities required to bring a product (or service) starting from the conceptual stage, followed by several stages of production, to delivery to the final consumer and destruction after use (ACIAR, 2012). The steps taken in the value chain analysis in this study were: (1) Entry point, that is the value chain analysis conducted in this entry point was done to ginger farmers, followed by a search with a snowball system to obtain a sample on the next point until the customer. (2) Value Chain Mapping (actors and product flow, flow of income, flow of information), identify and map core processes and actors involved in value chains. The resulting map depicted the actors in general. This map could be further developed by breaking down the core processes into specific activities carried out by different actors as identified (Puspito et al, 2016). After identifying the main actors of the value chain and other actors obtained by tracing backward (go backward) and forward (go forward), the next step was to determine the income (gain) of each actor obtained through the input-output relationship. (3) Upgrading the value chain, improvements were given to the value chain perspectives on core competencies and capabilities which were the dynamic actors, including the improvement of products, processes, markets and improvement in next chain. a) Improvements in the process can

occur in a company (actors) as well as the process of interaction between actors. b) Improvement of products both within the company and between actors c) The change in the position through the adjustment of the activity in the relationship (link) between actors or shifting relationship to link with other actors. d) Withdrawal of a value chain and then relate it to the new value chain.

AHP is a decision-making model to help draw up a priority and purpose of the various options using several criteria. To set the priority elements in a decision problem is to make paired comparisons (pairwise comparisons) with each element is compared in pairs to a specified criterion in a form of pairwise comparison matrices. It was done by fulfilling the pairs in comparison matrix using the numbers that describe the relative importance of a top of the other elements (Saaty in Prajanti, 2014). Meanwhile, according to Abdullah et al (2013), AHP Method is a systematic approach in the selection of alternatives or rankings and the problem of justification by using the concept of hierarchical structure analysis.

AHP is used as a method of solving problems compared to other methods for the following reasons: 1). The hierarchical structure as a consequence of the chosen criteria until the deepest sub criteria. 2). Take into account the validity up to the tolerance limit of inconsistencies as criteria and alternatives chosen by decision makers. 3). Take into account the resilience of the decision-making sensitivity of analysis output.

Through the method of Analytical Hierarchy proccess (AHP), there would be several strategies that can be used as an ingredient for ginger farming development strategies in accordance with the Semarang Regency hierarchy or priority. From some of these criteria, there would be a strategy which has a high priority to do in order to formulate development strategies for ginger farming in Semarang regency. Further, scale was given to explain the value of 1 through 9 as consideration for comparing the criteria with the other criteria as well as alternative criteria with one another (Saaty in Prajanti, 2014). The paired comparison scale used in the preparation of the priority strategies for Semarang Regency ginger farming can be seen in Table 3.

There were seven variables in this study. Value chain variable covered value chain and marketing margins. Sub variable included the value chain variable patterns of distribution channels, commodity prices and the costs incurred throughout the value chain. Components of the marketing margin included selling price, purchase price and other marketing costs. On the other hand, there were the variable of cultivation aspects in the AHP, namely post-harvest, marketing, institutional and policy.

3. Results and Discussion

3.1 Ginger Farm Performance Analysis in Semarang Regency

Farm performance can be measured by R/C ratio. This is stated by Soekartawi (1995) in Widyastuti, Soejono, & Widjayanthi, (2015) that to determine whether the ginger farming is profitable or not, one can do balance receipts and costs analysis (R / C). Other than that, Santosa (2009) states the concepts of efficiency and profitability are the indicators which are most often used in assessing the quality of performance.

According to the table 4. The value of R/C ratio obtained from comparing the total revenue with total costs amounting to 5.1. R / C value was 5.1, meaning that every expenditure Rp.1 generated revenue of Rp.5,1. From the R / C value that was more than 1, it could be said that the ginger farming was profitable in the study area. In this case, the ginger farm gained good enough revenue although the ginger plant maintenance was not in accordance with what was directed. The analysis showed an average production of ginger in Semarang Regency was 529.1 kg / year with an average selling price of wet ginger of Rp.7.091,83 / kg, so the earning gained by ginger farming per year at a cost of Rp.4.228,571 amounted to Rp.693.520. The analysis showed an average production of ginger in Semarang Regency of 529.1 kg / year with an average selling price of wet ginger Rp.7.091,83 / kg, so the earning of ginger farming per year at a cost of Rp.4.228,571 amounted to Rp.693.520. These results are similar to those obtained by (Saputra, Prasmatiwi, & Ismono, 2017), namely with ginger farm incomes by Rp.28.038.043,74 / ha, the obtained value was

R / C on total cost of $ 1,68 which means that the ginger farming is profitable.

3.2 Flow Pattern Analysis of Ginger trading system in the Regency of Semarang

Mapping the value chain was aimed to determine the pattern of the distribution chain as well as the important activities carried out by every actor in ginger farming in Semarang Regency. These activities were basically aimed at creating and enhancing values for all actors in the value chain of the ginger in Semarang regency. The results showed that the actors in the value chain of ginger in Semarang regency consisted of farmers, wholesalers, wholesalers and retailers. Figure 4 shows three patterns of distribution channel value chain, namely ginger in Semarang Regency in channel pattern 1, channel pattern II and channel pattern III.

Based on the research results, chain pattern I was the longest where the actors involved in the value chain consisted of farmer-merchant-collectors and wholesaler. In the second pattern there was farmer-trader- wholesaler. Meanwhile, the pattern III was the shortest trading system where there were only farmers and retailers in the value chain.

On the pattern of the first channel wet ginger farmers sold products at wholesalers. The results showed as many as 75 farmers, or 76.5% of the farmers sold soaked ginger to collectors. Further, the collectors sold it to wholesale for the distribution to retailers. The difference in price from the farmer to the retailer was Rp.17.000. it was due to several processes in the value chain, such as transportation costs and labor costs.

This is consistent with a research by Elsia & Effendy (2016) which states that the marketing costs will increase since more actors participate in marketing activities. In the first pattern value chain. farmers had the advantage of Rp.4.920,80; the benefits of Rp.16.791,67 from collectors, and Margin of Rp.11.000. The collectors had a greater advantage because of their ability to determine the price of ginger and knowledge of the market price to determine the purchase price at the farm level to benefit greatly when it was sold to wholesalers.

Goods pick-up facility by wholesalers at the farmers also attracted farmers to sell to ginger collectors although the price received was lower. Farmers agreed because they preferred simplicity and avoided no risk of no ginger absorption in the market. This is according to research conducted by Listyati et al (2017), that farmers prefer to sell their farm to collectors because they are easier to sell and do not need to bear the risk. Limitations of means of transportation, fear of ginger will not be absorbed by the market as well as asymmetric price in the market are reasons for the farmers in their marketing channel pattern I.

Collectors sold ginger from farmers to wholesalers. In this value chain, wholesalers had less profit than the mediator who was an actor with the greatest advantage. The advantage gained was counted Rp.2.840 per wholesalers; with a margin of Rp.3.000. This was because the price of ginger purchased from collectors was high enough so that the wholesalers did not dare to take greater advantage and avoided the risk of ginger sold were not sold to the retailer.

In this process the wholesalers performed activities such as transporting ginger. The existence of these activities led to the addition of the value obtained to ginger up into the hands of consumers. This is consistent with the marketing concept of agribusiness disclosed by Eden (2010), where the marketing function covers the physical use of time, place and form added to the products when they are transported, stored and processed to meet the desires of consumers. In this case, the wholesalers had added value in the form of transportation of ginger products from producers to consumers.

The second line pattern was similar to the pattern of channel I except the analysis of the role of mediator. Ginger farmers sold directly to wholesalers in wet form. By selling directly to wholesaler, the price received by farmers was higher than the marketing process through the collectors. The value formed in the pattern II at the farmer level was Rp. 10.000; with a gain of Rp.9.500, while the value formed at wholesalers' level was Rp 20,000 with a margin of 10,000; This value included the cost of labor to the porters at

Rp.160 / Kg, transport costs amounted to Rp.40 / Kg, and sorting costs amounted to Rp.120 / kg. Usually, in 1 ton of gingers, the wholesalers pay porters and sorters as much as 40,000 / person.

Farmers in the pattern of channel II were those with an average land area of 334m2 and yielded quite a lot product. They usually have a settlement adjacent to the wholesalers and the subscription merchants, are already famous for their ginger quality. Farmers in this marketing channel had the stronger bargaining power compared to the collectors and the sale. They made an agreement whereby the two parties reach a predetermined price for wholesalers based on information from the retailers. In the next process, wholesalers sold the gingers to the retailers.

Pattern III line is the shortest marketing channel where farmers dealt directly with retailers in sales of wet ginger. Farmers in this pattern usually acts as ginger trader in the area where they live. In this pattern, ginger price was high because farmers dealt directly with the retailers in the market. The sale value amounted to 15,000; with a profit of Rp.12.750. It was the net sales after reducing the cost of fertilizer and others.

A constraint found in this pattern was the uncertainty of market absorption done by traders. Retailers can at any time stop buying ginger from farmers so that at any time it can drastically lower the price of ginger because sometimes ginger supplied by traders is not sold out, while ginger owned stock is still a lot. In addition, the constraint in the sales of ginger in Semarang Regency was equal to research conducted by Saputra, Prasmatiwi, & Ismono (2017), namely the needs for ginger itself. As the marketing depends on the demand for ginger, so its price fluctuates; in addition, the imbalance of supply and the asymmetric market information also contribute as the constraints.

The flow of ginger products from farmers to consumers forms value chains. Each activity is mutually separated, but very dependent each other. This is consistent with the concept of the value chain is expressed by Hartati (2018), where

farmers ginger in Semarang Regency rely on collectors and wholesalers in the market the wet ginger.

This is consistent with the concept of the value chain where the flow of goods from producers to consumers raises the chain, but has the same dependence on one another. This suggests that ginger farming is one of the horticultural products in Indonesia that is relevant to the value of economy, social, and ecology (Aldensi, 2015) of what is produced by each actor from farmers to market that is varied. Certainly, a particular touch in the form of transportation and sorting can increase the selling price of ginger in Semarang regency.

The third pattern above is equal to research conducted by Widyastuti, Soejono, & Widjayanthi (2015), where the high price of soaked ginger in the market cannot be felt by ginger farmers as the manufacturers. The value-added was even more enjoyed by the wholesalers in the distribution chain channel. The distribution of income in the pattern of the value chain above does not indicate the presence of justice for all actors in the value chain. It is not compatible with the concept of the value chain as a strategic collaboration of various agencies that achieve specific markets in the long term for the benefit of the entire parties involved (ACIAR, 2012).

The ginger marketing pattern by collectors was still at the high marketing margin in all chains in which the benefits received by the farmers was smaller. It turns out that according to research by (Elsia, Hadayani, & Effendy, 2016) the small profit at the farm level has caused high marketing costs from farm to the final consumer. Unfortunately, the high price of ginger in the consumer could not be felt by farmers as the producers.

The constraints faced by the farmers of ginger in Semarang Regency were their asymmetrical ginger price information, transportation, low bargaining power, and poor knowledge. In connection with the constraints faced by farmers, research conducted by Karim & Biswas (2016), mentions that the non-value added activities lead to the price increase of the product because manufacturers do not have control over product pricing, transportation, information services and the number of intermediaries so that consumers pay the price almost twice from the manufacturer. Farmers who chose the first marketing patterns were mostly farmers who did not want to take the risk, had limited transportation and would update the price of ginger. In this case the one who determines the price is the collector.

The sales of ginger in this study showed that the sale of ginger was based on the access to markets and the quality of ginger itself. Determining the quality of ginger products in Semarang Regency became very specific rules because Semarang ginger had higher selling price than other ginger. This is in accordance with what is disclosed by ACIAR (2012), that rules are commercially specific (codified), for example the level of quality of agricultural products will link to their price transparently.

3.3 Priority Analysis on the Development Strategy Farming Ginger Semarang Regency

Agricultural sector becomes the leading sector in the economy of Semarang regency. Ginger commodity is one of considerable medicinal crops cultivated by farmers in that regency. As a region which has the largest land area in Central Java, Semarang Regency should improve the quality and quantity of ginger. To achieve these objectives, we need ginger farm development strategies. To do so, Analytical Hierarchy Process (AHP) derived from the questionnaire data has been processed using expert choice program 11.0 and produced strategies based on priority criteria that can be seen in Figure 5.

Based on AHP output criteria, a priority in the development of ginger farming in Semarang Regency was marketing at 0.364. The next criterion was the cultivation of 0.242, 0.147 policies, post-harvest 0.131 and 0.116 institutions. The importance of marketing to be the top priority is because the marketing aspects show the quality of the final result of agricultural products. The results of AHP showed inconsistency ratio of 0.05 or less than 0.1. With that inconsistency ratio, the results were said to be consistent and could be used in research.

Based on the AHP calculation (figure and video 6) most alternatives in the development of ginger farming in Semarang Regency were prioritized to done through marketing that could provide market opportunities and benefit to farmers with a percentage of 66%. It was followed by the second and third alternative priorities, namely promotion in all media, and independent export socialization with the percentages of 19% and 15% respectively. Regarding these results, market opportunity which benefited the farmers did not exist in the ginger farming in Semarang regency.

In opening profitable market opportunities for farmers, there is a need of supports from the government to oversee the process of marketing done by ginger farmers and provide information on how to get a chance in a market which is not risky to get information regarding the price, the amount of demand for ginger, and quality required by the market. Activeness is required by farmers to obtain detailed and real information. If farmers obtain favorable market opportunities, farmers will not always feel disadvantaged in terms of price and benefits. This is consistent with research by Widyastuti, Soejono, & Widjayanthi (2015), which states the market is an important factor for developing a business. Market opportunities that can benefit farmers by forming partnerships with companies to supply ginger and look for people who distribute to the export market.

Based on the calculation of AHP (Figure 7), the most prioritized criteria of all alternatives in the development of ginger farming in Semarang Regency was ginger cultivation export standards. Furthermore, the second priority was the extension of land revitalization and standard seed with the priority percentage of 33%. Then the third priority was the assistance of agricultural inputs (SAPROTAN) on time, quantity, price and quality with priority percentage of 26%. In other words, in the process of export-standard ginger cultivation is a needed to support the development of ginger farming in Semarang Regency because of the obstacles often faced by farmers in the cultivation of ginger was the low standard quality of ginger.

Determination of price protection regulations and administration became the main alternative priority in the policy aspects with a percentage of 88%. The second alternative priority in the policy aspect was to strengthen ginger branding Semarang which had the percentage of 12%. Pricing and the marketing of ginger are indispensable since the price of ginger in the market tend to fluctuate and the long selling governance became the obstacles faced by farmers in the process of enhancing the development of ginger farming in Semarang Regency. The price of ginger in the market was only temporary until it is bought by the collectors. In addition, the strengthening of branding will promote the identity and characteristics of the ginger products.

The problems that are often experienced by farmers is a long marketing chain. It is important to do price protection to farmers so that they no longer receive information only from collectors and wholesalers. The selling system to set should be beneficial to all parties concerned so that no one feels harmed one another. With the determination of price protection the regulations of ginger trade system is expected to provide a sense of security, be profitable and can maintain a transparent ginger trade. This is consistent with research by Widyastuti, Soejono, & Widjayanthi (2015), that the price of ginger is still controlled by the middleman, and there is no benchmark prices from farmers. Here, farmers are less informed about the ginger selling price they have just sold to the middleman. It proves that farmers get very limited market information.

Based on the AHP calculations (Figure 9), most alternatives were prioritized in the development of ginger farming in Semarang Regency through post-harvest processing criteria as well as the training of innovation and diversification of products by 43%. In addition, the third was prioritized in the procurement and facilitation of ginger drying machine with a percentage of 14%. The need for right processing strategies in post-harvest as well as the training of innovation and diversification of products are needed in order to increase the selling point of ginger because usually farmers just sell ginger in wet form and if it passes through post-harvest processing into powdered ginger or others, there

will be value-added for farmers.

Based on a calculation using AHP (Figure10) there found three priorities, namely forming a network through partnerships, extension of institutional effectiveness and institutional support for active capital. The most prioritized alternative in the institutional aspect was to establish a network in partnership with a percentage of 50%. The second alternative was counseling institutional effectiveness with a percentage value of 37%, while the latter was capital assistance for active institutional value with the percentage of 13%.

Awareness that needs to be built by farmers is the awareness of community or group that grows on the basis of need, not coercion and encouragement of specific projects. It is because farmer groups which conduct activities independently can be advanced criteria farmer groups or oriented business strategy. Helps from the government and private sectors in supporting and facilitating the partnership of farmers are needed to increase business cooperation. Through partnership, it is expected to be a transfer of technology, knowledge and expansion of information for the development of enterprises. In accordance with the institutional economic theory according to Kasper and Streit (1993) in Yustika (2012) institutional economy is useful to respond to the economic experiences and determine how efficient the economic results obtained as well as determine how much economic distribution obtained by each participant.

Based on the overall results of AHP analysis the value of inconsistency ratio gained 0.05 <0.1 (maximum limit) which meant the results of the analysis were acceptable. It was found that the most prioritized aspect in the development of ginger farming in Semarang Regency was beneficial market opportunities for farmers. The overall priority order of ginger farming development strategies in Semarang Regency based on a calculation of AHP can be seen in (Figure 11.).

Based on the results of AHP, the most important criterion for the development of the ginger farm was the market opportunities which were favorable for farmers. This is in line with

the value chain analysis of ginger in Semarang Regency, namely farmers interact more with intermediaries than consumers directly. Therefore, the most appropriate marketing strategy was to enable farmers with consumers. Thus, less value chain would increasingly give farmers more benefit.

Furthermore, based on the results of initial survey, the ginger farmers in Semarang Regency felt less profitable. Apparently, there was a difference between the perception of farmers with the calculated R / C ratio. Based on the results of R/C Rati, the ginger farming in Semarang Regency was favorably with the value of 5.1 or the income of farmers was greater than the spent cost. In this case, the ginger farm gained good enough revenue despite the lack of maintaining the ginger plant that was not based on the standards.

4. Conclusions

According to the findings, several conclusions were drawn as follows: (1) Based on the calculation of the R / C ratio of 5.1, the ginger farming in Semarang Regency is profitable and deserves to be developed. (1) With the acceptance of the ginger farm at Rp.4.228.57 / year and production costs amounting to Rp.693.520 / year, ginger farmers in Semarang Regency still get a profit of Rp.3.535.051 / year. (2) Based on the Value Chain Analysis, there are three patterns of business and ginger administration in Semarang Regency depending on the amount of production, transportation, facilities and capabilities of farmers. The first pattern is from farmers to collectors to wholesalers and retailers; The second pattern is from farmers to wholesalers to retailers; and a third pattern is from farmers to retailers. Farmers tend to choose the pattern I because farmers do not have to transport the goods due to pick-up facilities by the collectors. On the other hand, farmers whose house is near to the market and tend to have a lot of production prefer the pattern II and III patterns because the higher selling price of their ginger. (3) Based on the calculation of the Analytical Hierarchy Process (AHP) the most prioritized criterion in ginger farming development strategies in Semarang Regency is marketing with a weight of

0.364 or 36%. This is consistent with results of field data that ginger farmers still require market opportunities that benefit farmers. The next criterion is the aspect of the cultivation of 0.242 or 24%, and policy aspects 0.147 or 15%.

Based on the research results, discussion and conclusions, suggestions and recommendations are given, namely (1) farmers are suggested to do post-harvest processing, such as making ginger powder to increase the selling value of ginger. Besides, farmers maximize the use the means of production (seeds, fertilizers, pesticides and labor) optimally so as to increase their income. (2) Ginger farmers in the Regency of Semarang are suggested to form farmer groups so that the marketing chain of ginger is not too long and can increase farmers' income. (3) The government should open lucrative market opportunities for farmers with innovative policy in the form of digital marketing. so that farmers can market their own crops without collectors and wholesalers.

This research has many weaknesses because of the limitations of the writer. The weakness of this research is that it still focuses on Semarang Regency although there are still other regions in Indonesia that have similar problems. Due to the limitations of the author, it is recommended for further research to relate the analysis of the value chain and the development strategy of ginger farming so that it can be carried out and solve problems in other areas as well as increase the welfare of the ginger farming actors in Indonesia.

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6. Appendixes.

Table 1. Export and Import Commodity of Medicinal Plants Year 2017

Commodity	Volume (Tons)		Value (US $)	
	Export	**Import**	**Export**	**Import**
Ginger	21,030,933	40 160	11.56136 million	80 086
Saffron	15 126	5,750	5,071	13,001
Turmenic	4914198	531 860	7075886	727 523
Other Medicinal Plants	1902805	666 000	5225247	853 103
Cardamom	4579629	2,000	7095.490	9284

Source: Statistics of Indonesia Medicinal Plants in 2018

Table 2. Production of Medicinal Plants of Central Java Year 2015-2017

No.	Commodities	Year		
		2015	**2016**	**2017**
1	**Ginger**	40.30174 Million	48,421,766	45,352,918
2	dringo	114 633	201 634	158 718
3	Cardamom	21.41874 Million	22,477,798	21,120,637
4	kejibeling	142.92	49 207	108 649
5	Galangal	8.76488 Million	8690536	7580869
6	Turmeric	28,573,746	27,612,177	27,908,208
7	galangal	13,055,705	4838944	15,768,793
8	lempuyang	2902711	2794083	3165917
9	Noni	825 163	448 019	459 487
10	sambiloto	162 851	277.6	280 391
11	temuireng	3758173	2534231	2543358
12	fingerroot	930 657	1065393	829 723
13	Curcuma	10,043,653	6.92779 million	8192254
14	Aloe vera	35 251	76 633	46.42
15	Mahkota Dewa	874 969	549 436	671 828
	Total	131 905 792	126 965 247	118 419 377

Source: *Provinsi Jawa Tengah dalam Angka* (processed), 2018

Table 3. Paired Comparison Scale

Value Comparison	Definition
1	The aim with each other equally important
3	Objective one Slightly important (somewhat stronger) than the Other objectives
5	Objective one is More important than Other destinations
7	One Very important purpose Than other destinations
9	Objectives of the absolute importance than other destinations
2,4,6,8	The midpoint between two Values Adjacent consideration

Source: Saaty in Prajanti, 2013

Table 4. Revenue and Average of Ginger Farming Cost in Semarang Regency in One-Time Harvest Time in One Year

No.	Information	Average	Percentage
1	Reception	Rp4,228,571	
2	Farming costs		
	1. Fertilizer	Rp583,929	84%
	2. Seed	Rp60,000	9%
	3. Labor	Rp49,592	7%
3	Total Cost of Farming	Rp693,520	100%
4	Farming income	Rp3,535,051	
5	R / C Ratio	5.097255394	

Source: Processed Data, 2019
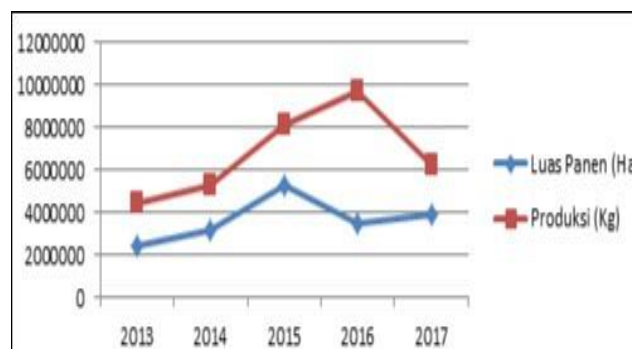
Figure 1. The Harvested Area and Ginger Production in Semarang Regency Year 2013-2017
Source: Department of Agriculture, Fisheries and Food of Semarang regency, 2018
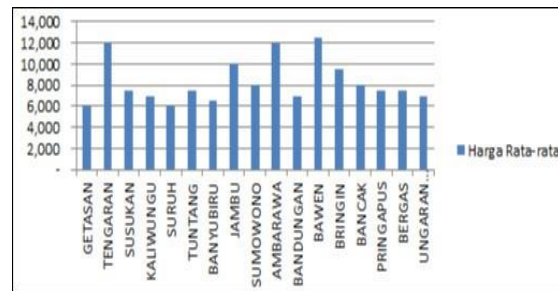
Figure 2. Price Average of Wet Ginger in Semarang Regency in 2017
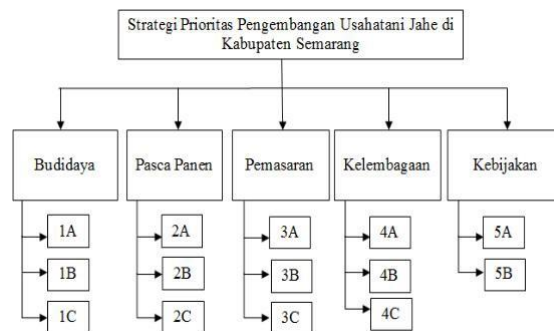source: Department of Agriculture, Fisheries and Food Semarang regency, 2018

Figure 3. Criteria Criteria and Alternatives

AHP Information:
1A: Provide counseling for land revitalization and assistance of ginger-standard seeds.
1B: Provide training in ginger cultivation process which refers to the export standard.
1C: Provide provision of agricultural inputs (SAPROTAN) on time, quantity, price and quality.
2A: Raise awareness farmers to do proper post-harvest handling.
2B: Provide procurement assistance for the ginger dryer machine tool and conducting advocacy groups in their use.
2C: Provide training innovation and product diversification to increase value-added production.
3A: Provide socialization on branding and guidance in order to export independently.
3B: Open the market opportunities that benefit farmers.
3C: Do promotion through printed, electronic and social media.
4A: Provide counseling for strengthening the effectiveness of ginger institutional coordination at all levels.
4B: Provide capital assistance / intensive institutions active farmer.
4C: Maximize the institutional empowerment of farmers so as to form a partnership network.
5A: Adoption of legislation concerning the protection and administration ginger prices.
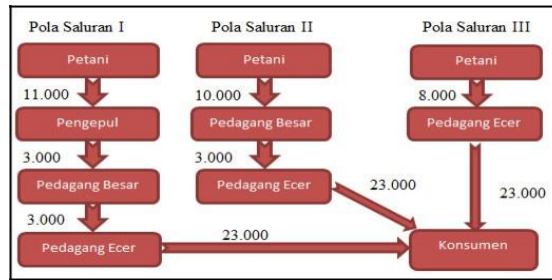5B: Adoption of legislation on strengthening branding ginger Semarang.

Figure 4. The pattern of business administration and Margin Line of Ginger
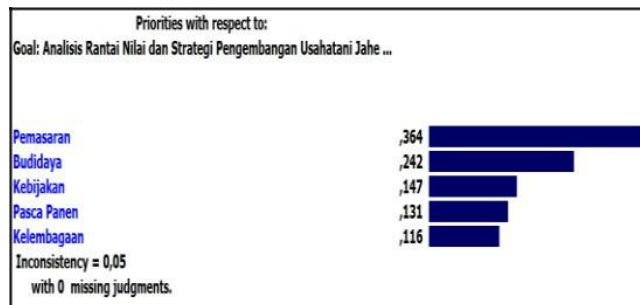Sources: Primary data is processed, 2019

Figure 5. AHP Output of the criterion of Ginger Farming Development in Semarang Regency
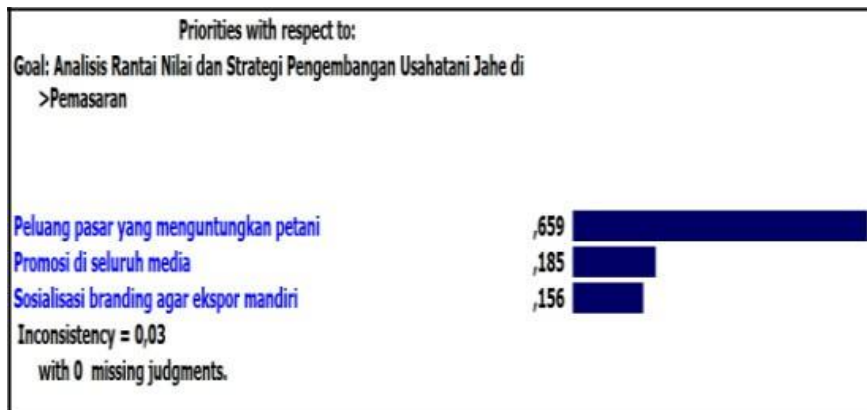Sources: Processed primary processed, 2019

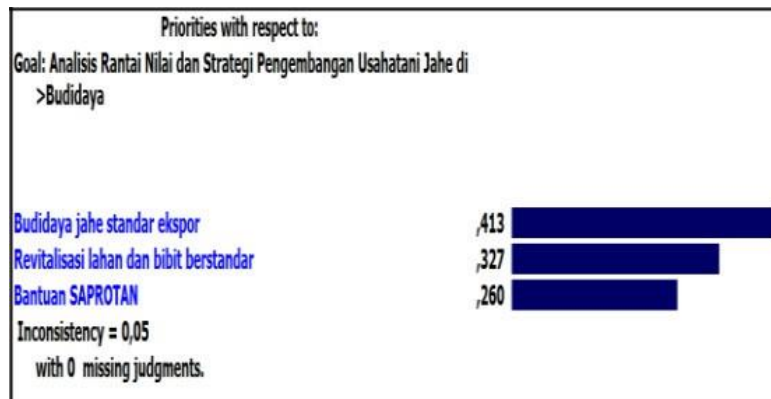**Figure 6. AHP Output of Marketing**
Sources: Processed primary data, 2019

Figure 7. AHP Output of Cultivation Criterion
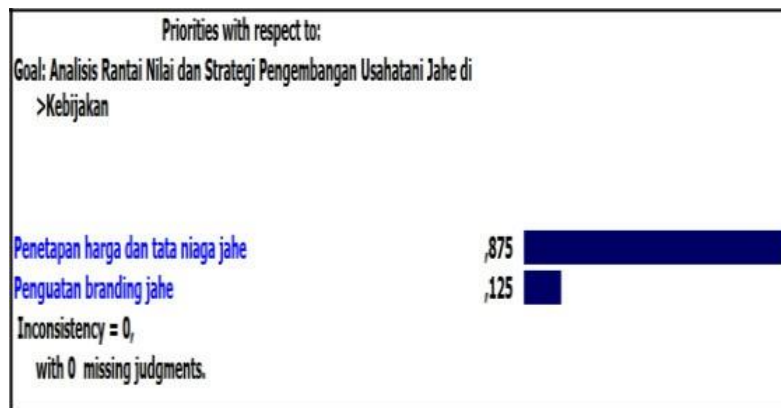Sources: Processed primary data, 2019

Figure 8. AHP Output of Policy Criterion
Sources: Processed primary data, 2019

Figure 9. AHP Output of Post-Harvest Criterion
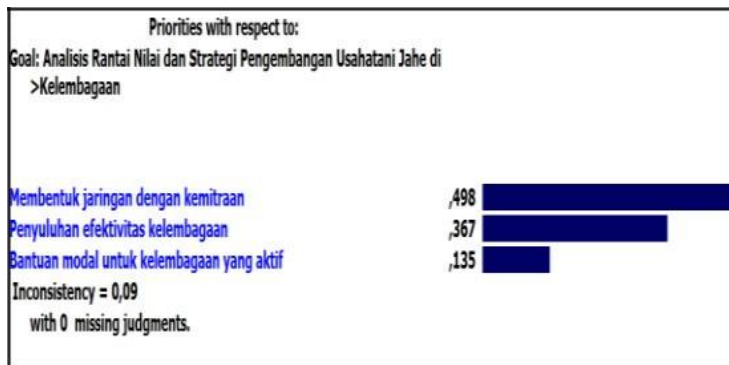Sources: Processed primary data, 2019

Figure 10. AHP Output of Institutional Criterion
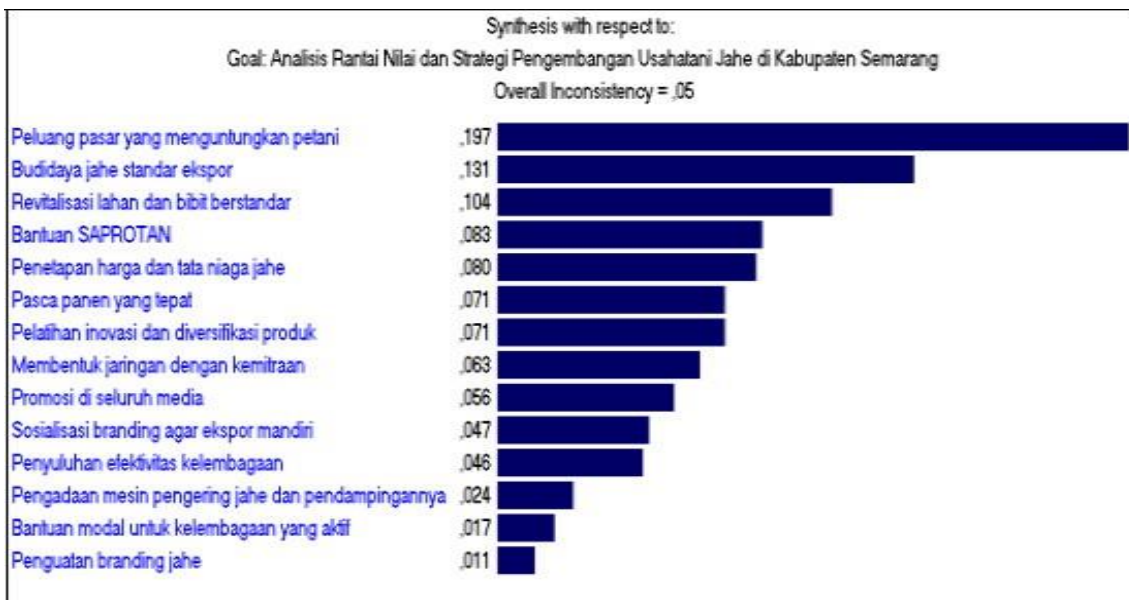Sources: Processed primary data, 2019

Figure 11. The Sequence of Ginger Farming Development Strategies in Semarang Regency
Sources: Primary data, processed in 2019