Determination of Performance Measurement Metric of Mango Agroindustry In Cirebon District, Indonesia

Lies Sulistyowati 1), Pandi Pardian 2), Nur Syamsiyah 3)
1), 2), 3) Department of Agriculture Socio Economic, Faculty of Agriculture, Padjadjaran University
Email: lies.sulistyowati@unpad.ac.id

Abstract
Cirebon regency is known to be the center of mango fruit production in Indonesia, and the best known is mango “Gedong Gincu”. Besides consumed in the form of fresh fruit, mangoes have also been processed into various forms of preparations such as mango dodol, mango juice, candied mango and pure mango. Mango price fluctuations also affect the mango industry's aro-industry activity. This study aims to design the performance measurement metrics on mango agroindustry in Cirebon District. The method used in this research is Analytic Network Process (ANP) to design agro-industry performance measurement metrics. The results showed that in determining performance measurement metrics using ANP get three main criterions that is internal factor of agroindustry, agroindustry agro actors and performance of mango agroindustry. The most influential indicators in the sustainability and development of processed mango agroindustry as icon of Cirebon Regency are capital support (1.70), government support (0.099) and value added of rice from agro-industry activities (0.063)

Keywords: Analytical Network Process (ANP), Agroindustry, Mango

1. Background
Although Indonesia is the world's number five mango producer, after India, China, Kenya and Thailand (FAOSTAT, 2012), but on the other hand, mango imports have tended to increase over the past ten years. If you look at the development of mango production over the last ten years, it is quite encouraging, the trend is increasing by an average of 12% per year (BPS, 2013). Increased mango production in Indonesia from year to year can be seen in Figure 1:
Figure 1. Graphic of Indonesian Mango Production (Ton)

Figure 1 shows a serious problem, where mango production in Indonesia continues to increase (12% / year), becomes the fifth mango producer of the world, but imports tend to increase, while average mango export per year is very small, only 0.07% Total production. This very strategic national problem needs to be sought immediately.

The increasing trend of market demand, both domestic and international markets, has not significantly improved the welfare of mango farmers in Indonesia. This is because, in addition to the low quality of mango production, also due to the price of fresh mango that is very volatile, especially during harvest time (December-March), the price of mango fell almost 50% below the normal price. This is very detrimental to farmers. (Sulistyowati, L. 2013).

The field study also shows that 20-30% of mango farmers' production does not go to Grade A and grade B, meaning mango reject is refused to enter modern market and export market. Mango reject in the end is almost worthless, because it is sold to traditional markets are also not appreciated. The only best alternative is through further processing, either as candied mango, mango puree, mango juice, mango dodol and others. Agro-mango industry has a very good opportunity, because the demand is high enough, and will get value added for mango farmers and provide additional employment for the surrounding community. Judging from the mechanism of fresh mango prices, mango agroindustry will reduce over-supply at harvest time, so the price of fresh mango will also be better, and this will provide benefits for mango farmers.

The phenomenon in the field shows that mango agro-industry has started to be done by craftsmen in mango production center such as: Cirebon area. And as a preliminary study, it is necessary to study the Determination of Performance Measurement Metric for Agroindustry Mango in Cirebon District.

2. Objective of the study

The objective of this study are:
1). To identify the dimensions needed for measuring the performance metric of the agro-industry mango SMEs
2). To Analyze the components needed for the development of mango agro-industry SMEs.

3. Research Methods

The research design used is qualitative design. While research technique used is case study. The data used in this study are primary data and secondary data. Data analysis used is weight analysis from criteria and sub criteria by using ANP method. Determination of respondents in this study was chosen intentionally (purposive) that is agroindustry business that utilizes mango as raw material that is a pioneer of business. Discussions and interviews with various stakeholders such as, Bappeda Cirebon district, KUKM service, Industry and Commerce service, and Tourism office.

4. Results and Discussion

1). Mango Agroindustry.
Mango Agroindustry is a must in Cirebon regency because Cirebon regency in West Java has been known as one of mango producing district especially mango gedong gincu. As a mango-producing and mango-producing area of seasonal production where during harvest season (on season) the number of products abundant and vice versa at the time of the season (out of season) is very difficult to find. At
the time of harvest season the products of various types of mangoes in the district of Cirebon abundant and not absorbed by the market and not utilized to the maximum by farmers and farmer groups. Agroindustry is one of the alternative to absorb the product of agricultural product to be further obtained to become a product of added value. As one of the largest mango producing areas not only mango gedong mango but also other mangoes Cirebon Regency has potential as a center for the development of processed products of agricultural products, especially mango. The development of processed industry is expected to become an attraction in Cirebon regency. Mango Agroindustry in Cirebon Regency on decision making process towards criteria and sub criteria which is weighted on key performace indicator (KPI) by using tools in the form of analytical tool by using Analytic Network Process (ANP).

Based on the calculation of agro-industry performance in Cirebon Regency.

By using ANP method, the initial step of pairwise comparison is used, so that the weight of each performance indicator is determined. In this process we use pairwise comparison questionnaires. From the calculation resulted paired comparison table

2). Determination of Agro-Industry Performance Metrics
The use of network process analysis (ANP) in the form of ANP framework in design of performance measurement metrics of mango agroindustry which is done to produce the classification of metric measurement which is divided in 3 parts / criteria that is:
Section / Criterion 1 Internal Agroindustry Factor: related to internal factors affecting the existence of mango agroindustry among others, attitudes and motivation of the owner, the presence of equipment, labor used, raw materials, administration (SOP) and capital in the business.
Section / Criteria 2 Actor Agro-industry Activities: related to actors involved and participate in agro-industry activities consisting of: Farmers, government, companies, retailers, and traditional markets.
Section / Criteria 3 Agroindustry Performance: related to Performance Indicators to evaluate agroindustry performance such as product quality, value added of product result, product marketing partner, supplier partner of raw material (Farmer).
Internal Priority Agroindustry Factor

The sustainability of an agroindustry depends on the internal factors of its management. In mango agroindustry, several aspects are considered based on the results of research through focus group discussions and interviews and in-depth interviews with related parties. Internal factors that most affect the activity of mango agroindustry is capital. Mango agroindustry is categorized into small and medium enterprises so that the capital factor for business operation becomes very dominant because capital is used to buy equipment and raw material in agroindustry activities. The existence of capital support for the purchase of equipment and raw materials will motivate the owner to try to run business activities.

Figure 2. General Model ANP

Figure 3. Priority section Internal Criteria Agroindustry Factors
Limitations of capital support from the government, or financial institutions can be done with the support of equipment and cooperation supply of raw materials with farmers or farmer groups. Third party roles and support are required for further fostering of small and medium sized businesses. Third parties other than the government through relevant agencies and financial institutions can provide support in terms of administration and financial management and working procedures of good product processing through informal training and persuasive approach to business actors.

**Priority Agroindustry Actors**

Mango Agroindustry activity itself system need support of various parties, support and also cooperation with other party in order to realize mango and its processed agroindustry become an icon of area need to be done with synergy of cooperation. The government through the relevant agencies is the most needed support for the development of agroindustry in Cirebon District. Not only government support for the supply of raw materials from farmers or farmer groups is required to run the business. Mango agroindustry with the category of SMEs still focusing on marketing through traditional markets but did not rule out the existence of marketing cooperation with modern retail with government support to fulfill the requirements of ordering from modern retail.

![Figure 4. Priority Criterion Actor](image_url)

Government support is quite complex, in addition to support in the provision of equipment, training and marketing and promotion of products to make mango and its agroindustry become new icon in Cirebon regency. In addition to these support anticipated needs and demand for raw materials also become one of the respective domain of the parties involved. The availability of raw materials at the time out of season requires the supply of fresh or semi-finished raw materials that...
can be stored for a certain period is also required and access to these activities is largely controlled by the government in cooperation with other parties.

**Performance Priority Agroindustry**

Agro-industry performance is seen from the results of business performance or business output in the scope of consumer society and business owners. The added value criteria of the resulting product become one of the main triggers of mango agroindustry business. The greater the added value generated from the agro-industry activities will increase the interest of business actors to plunge into the business. Currently, if compared between the price of processed products made from raw mango, especially mango “Gedong Gincu” then the price of fresh products will be more profitable compared to processed products. Therefore, the use of raw materials of mango and processed products made of mangoes must be able to provide additional value that is beneficial for the perpetrators. Selection of the type and quality of raw materials requires cooperation with the mango raw material suppliers so as to provide a great additional value for the perpetrators of mango agro-industry. The product marketing partners, especially the traditional ones who are not involved in the marketing chain will also add to the profit margin.

![Figure 5. Priority Criterion Agroindustry](image-url)

The performance of mango agroindustry is currently not very focused on product quality because marketing is done in traditional markets or directly at home and pastry shop. Based on the algorithm calculation of the matrix, the final result of the priority weight is known that in general the priority priorities globally are as follows:
From the global calculation weights of each part of the measurement metrics are known to the general magnitude of the sub criteria / sections that are part of the performance measurement metric of mango agroindustry in Cirebon District.

5. Conclusions and Suggestions

Conclusion

1. The design of performance measurement metrics of mango agroindustry is aimed to support sustainable agroindustry consisting of three dimensions, namely internal factors, actors and agroindustry performance.
2. To develop mango agroindustry with its processed products as one of the new icons of Cirebon Regency, it needs major support from three components such as Capital, Government and the existence of a large margin or added value that can be generated from agro-industry activities run by business actors.

Suggestion

1. Local government through related institutions has an important role in supporting and mobilizing mango agroindustry.
2. Mango agroindustry entrepreneurs need to take into account the season and calculation of raw material requirements to keep producing during the out of season period.

3. The need for promotion assistance, certification process and safe food business training and product branding as part of the regional brand.

6. Acknowledgment
The author would like to thank the Rector of the Padjadjaran University, which has provided funding through “RKDU (Research Kompetensi Dosen Unpad) 2017”, so that this research can be carried out.

7. References
Dewayana, S. T., and Budi, A., Selection of Cooper Rod Supplier Using ANP Method, Journal of Industrial Engineering Department of Diponegoro University, IV (3), 2009, pp 212-217


F. Rizqiah and A.S, Setiawan, Analysis of Added Value and Metric Determination of Calina Supply Chain Performance Measurement (Case Study at PT Sewu Segar Nusantara) Management and Organization Journal, Volume 5 no 1, 2014


