

Comparison of Willingness to Process Fresh Mango into Processed Mango Products between Mango Farmers In Majalengka and Kuningan Regency, West Java

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Abstract- The processing of fresh mangoes into processed mango products is very important to bring added value so that it has the potential to increase family income. This study aims to identify, compare and analyze the differences of willingness to process fresh mangoes into processed mango products between mango farmers in Majalengka Regency and Kuningan Regency. The research design used a quantitative research design with survey methods through interviews with 121 mango farmers in Majalengka Regency and 110 mango farmers in Kuningan Regency who were determined by stratified random sampling technique. Data were analyzed using descriptive statistical analysis and the Mann-Whitney U-Test. The results showed that the majority of mango farmers in Majalengka Regency have the willingness to process fresh mangoes into processed mango products (60.3%). Meanwhile, the majority of mango farmers in Kuningan Regency not have the willingness to process fresh mango into mango processed products (79.1%) and those who have the willingness to process fresh mango into processed mango products are only around 20%. The age factor is the main reason for those who are interested and the factor of increasing income is the main reason for those who are interested in processing mangoes. Meanwhile, the results of the Mann-Whitney U-Test analysis showed a significant difference in the term of willingness to process fresh mango into mango processed products between mango farmers in Majalengka Regency and Kuningan Regency at the population level.

Index Terms- willingness to process, processing mango, fresh mango, processed mango products, mann-whitney u-test

I. INTRODUCTION

One of the leading commodities of Indonesian horticulture is mango commodity (*Mangifera indica L*). The physical characteristics of mangoes are distinctive and their fresh taste makes them in demand by consumers in both the domestic and export markets. In Indonesia itself there are several provinces that become the center of national mango production. Based on Table 1, in Indonesia there are three provinces with the largest mango producers, namely East Java, Central Java and West Java provinces with contributions to national mango production of 40.36 percent or 1,059,325 tons from East Java Province, 16.90 percent or 443,487 tons from Central Java and 15.41 percent or 404,543 tons from West Java. However, in terms of mango productivity, West Java Province has the highest productivity among other mango producing provinces in Indonesia. West Java has mango productivity of 14.31 tons per hectare while in East Java as the largest mango producer in Indonesia only produces 12.71 tons per hectare in 2018. This shows that mango production in West Java is very productive because the harvest area is not so high but can produce maximum mango production.

Table 1. Mango Harvest Area, Production and Productivity for 2017-2018 Based on Leading Provinces in Indonesia

Province	Harvest Area (Ha)		Production (Ton)		Productivity (Ton/Ha)	
	2017	2018	2017	2018	2017	2018
East Java	88.847	83.353	898.595	1.059.325	10,11	12,71
Central Java	35.801	36.763	389.019	443.487	10,87	12,06
West Java	23.959	28.273	325.457	404.543	13,58	14,31
West Nusa Tenggara	10.819	11.265	165.25	151.354	15,27	13,44
South Sulawesi	9.083	10.386	97.026	120.968	10,68	11,65

Source: Central Statistics Agency and Director General of Horticulture, 2018

West Java as one of the largest mango producing provinces in Indonesia has five mango production centers, including Indramayu, Sumedang, Cirebon, Majalengka and Kuningan Regency so that mango production contributes to the increase of mango production at

the provincial level. For the amount of production produced by the five districts of the production center is not always high and the results vary because it does not close the possibility of behavior in different farming. Based on Table 2, Majalengka and Kuningan Regency are the two mango production centers with the lowest production in West Java. Agribusiness activities in both Regency are still at low to moderate levels. According to [1], the performance of agroindustry sub-system in Panyingkiran district, Majalengka Regency has the least performance value compared to other sub systems. This is because mango farmers do not wash mangoes, they also do not do mango sorting activities. Mango farmers also do not do grading activities because mango farmers feel they still do not understand to do these activities [2]. [3] stated that based on marketing margin, profit, farmer's share, marketing efficiency, all mango marketing channels in Majalengka are categorized as efficient. Whereas, farmers' farming behavior in Kuningan Regency has not been intensive in controlling pest attacks and this is suspected to have an effect on low farmer production [4]. So that when viewed from this, the agribusiness behavior of mango farmers in Kuningan Regency is still not efficient.

Table 2. Mango Commodity Production in West Java Province by District in 2018

Kabupaten	Total Produksi (Ton)
Indramayu	94.114,7
Sumedang	73.582,1
Cirebon	55.476,7
Majalengka	44.756,7
Kuningan	34.850,6

Source: Jawa Barat dalam Angka, 2018

The low production of mango farmers in Majalengka and Kuningan Regency is also related to their low income from mango farming. In addition, most of the mango farmers are farmers with narrow land tenure for mangoes [5]. Big farmers produce mangoes with good grades while small farmers produce bad grades [6]. Farmers can actually increase the added value of mango commodities into processed products such as fruit juice, dried mango, jam, chili sauce, yogurt, mocha, ice cream, pudding, mango powder and other types of mango preparations so that mangoes can continue to be consumed by the public and drive the selling price which can also increase so that production results are not wasted and the shelf life becomes longer. Referring to [7] and [8], even mango waste can be processed into processed mango products such as mango peel chips or other products. This processing activity brings added value so that it has the potential to increase his family's income. Especially when the mango harvest season comes, causing an over supplies of mangoes. This situation causes the price of mangoes to be cheap, and even farmers often cannot market their mango crops.

Farmers usually sell their products to *bandar* or collectors directly in fresh form. Based on the results of research by [9], it is found that farmers who carry out the mango processing process are still very low. This is in line with the results of research by [10] which states that farmers in cultivating agriculture and technology absorption are still low. This is partly due to the limited knowledge of farmers about the added value that will be generated by processing mangoes to increase their family income so that the interest of mango farmers to process mangoes is still lacking.

In terms of mango production and agribusiness potential, Majalengka Regency is relatively better than Kuningan Regency. Then the question that arises is whether mango farmers in Majalengka Regency are also more interested in processing fresh mangoes into processed products than mango farmers in Kuningan Regency. Thus, the study aims to identify, compare and analyze differences in the willingness to process fresh mangoes into processed mango products between mango farmers in Majalengka and Kuningan Regency.

II. RESEARCH METHOD

A. Research Object and Location

The object of this research is the farmers' willingness to process fresh mango into processed mango products. The location of this research is in Majalengka Regency and Kuningan Regency, West Java Province. The location of this research was chosen with the consideration that these two areas are regencies centers of mango production in West Java Province with relatively low mango production compared to other mango production centers in West Java.

B. Research Design and Methods

The design in this research uses a quantitative research design using numerical methods to define an observation or variable that becomes the object of research. The research method used in this research is a survey method through interviews with respondents.

C. Research Population and Sample

The number of population of this research is 2, namely the population of mango farmers in Majalengka Regency and the population of mango farmers in Kuningan Regency. The sampling technique used to determine the sample was stratified random sampling technique,

so that a sample of 121 respondents was obtained for the sample of farmers in Majalengka Regency and 110 respondents for the sample of farmers in Kuningan Regency.

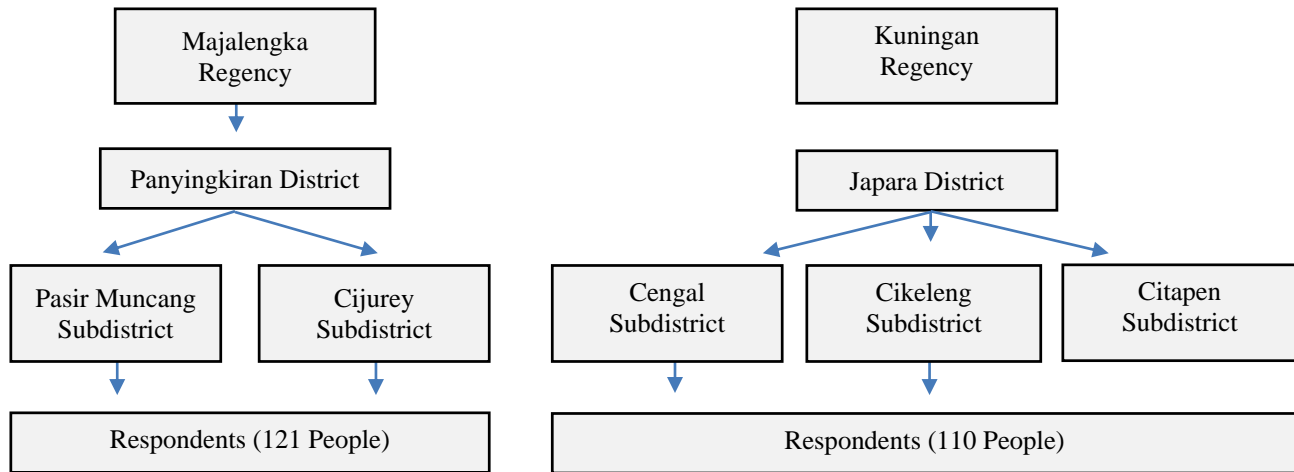


Figure 1. Sampling Techniques for Mango Farmers in Majalengka and Kuningan Regencies

D. Data analysis

Data analyze technique used in the research are descriptive statistics analysis and Mann-Whitney U-Test. Descriptive statistics analysis used in this study is a frequency distribution table of the variable of willingness to process fresh mango into processed mango products from sample of farmers in Majalengka and Kuningan Regencies and any other types of descriptive statistics. Meanwhile, the Mann-Whitney U-Test was used to test the differences in willingness to process fresh mango into processed mango products on populations from sample of farmers in Majalengka and Kuningan Regencies. The Mann-Whitney U-Test is a hypothesis testing for 2 independent samples with non-parametric methods for qualitative variables with an ordinal measurement scale. The steps for hypothesis test about the differences of willingness to process fresh mango into processed mango products between mango farmers in Majalengka Regency and Kuningan Regency using the Mann-Whitney U-Test as follows:

a. Hypotheses

H_0 : There is no difference in term of willingness to process fresh mango into processed mango products between mango farmers in Majalengka Regency and Kuningan Regency in the population level.

H_a : Willingness to process fresh mango into processed mango products between mango farmers in Majalengka Regency and Kuningan Regency is different in the population level.

b. Test Statistics

The distribution form of Mann-Whitney U-Test is approximately normal distribution (z) for large case ($n_1, n_2 \geq 7$) with test statistics as follows:

$$z = \frac{U - \mu_U}{\sigma_U}$$

where

$$\mu_U = \frac{n_1 n_2}{2}$$

and

$$\sigma_U = \sqrt{\frac{n_1 n_2 (n_1 + n_2 + 1)}{12}}$$

Note:

n_1 = The size of the sample of farmers in Majalengka Regency

n_2 = The size of the sample of farmers in Kuningan Regency

U = Number of ranks of willingness to process fresh mango into processed mango products mango of farmers in Majalengka Regency (or Kuningan Regency)

μ_U = Mean of sampling distribution of U

σ_U = Standard deviation of sampling distribution of U

c. Rejection Rule

Reject H_0 if $p\text{-value} \leq \alpha$

The data analysis process is carried out using SPSS 22 software statistics tools.

III. RESULT AND DISCUSSION

A. Description of Willingness to Process Fresh Mango into Processed Mango Products between Mango Farmers In Majalengka and Kuningan Regency

The results showed that the majority of mango farmers in Majalengka Regency who have a willingness to process fresh mangoes into processed mango products are as much as 60.3%, while those who are not interested in processing fresh mangoes into processed mango products are 39.7%. Meanwhile, there were 79.1% of mango farmers in Kuningan Regency who did not have the willingness to process fresh mango into processed mango products and those who had the willingness to process fresh mango into mango processed products only around 20% (Table 3). This shows that mango farmers in Majalengka Regency are more interested in developing their business more. According to [11], [12] and [13], mango farmers in Majalengka Regency have often attended counseling and training on mango development and are supported by local government policies.

Table 3. Frequency Distribution of Willingness to Process Fresh Mango into Processed Mango Products between Mango Farmers In Majalengka Regency and Kuningan Regency

Regency	Willingness to Process Mango	Frequency (Person)	Percent (%)	Cumulative Percent
Majalengka	No	48	39.7	39.7
	Yes	73	60.3	100.0
	Total	121	100.0	
Kuningan	No	87	79.1	79.1
	Yes	23	20.9	100.0
	Total	110	100.0	

Source: Primary data, processed (2020)

B. The Reason of Farmers about Their Willingness to Process Fresh Mango into Processed Mango Products

There are many reasons why mango farmers both in Majalengka Regency and Kuningan Regency do not have the willingness to process fresh mangoes into processed mango products. These reasons are summarized in Table 3. Mango farmers in Majalengka Regency stated more reasons than mango farmers in Kuningan Regency. However, from all the reasons put forward directly by the respondents, the old age factor was the reason most frequently cited by mango farmers in Majalengka Regency and Kuningan Regency. Mango farmers in Majalengka Regency and Kuningan Regency have an average age of over 50 years old. In addition, based on Table 4, it can be seen that the median age of mango farmers in both Majalengka Regency and Kuningan Regency is more than 50 years, meaning that more than half of the number of mango farmers in these two areas are over 50 years old with the oldest age of the respondents is 87 years old. This age factor certainly affects farm productivity. According to [14], the development of agribusiness businesses that were traditional in nature, are now more modern and global in nature, this requires young farmers to be willing to be involved in developing agribusiness in Indonesia.

Table 4. Reasons of Mango Farmers Not Interested in Mango Processing Based on Regency

Reason	Regency		Total
	Majalengka (Person)	Kuningan (Person)	
- Selling Results of fresh mango harvest is enough	2	5	7
- I'm lazy	0	1	1
- High risk	1	4	5
- Complicated, troublesome, complicated	0	7	7
- Being sick	0	1	1
- Busy	2	1	3
- Already exhausted	0	2	2
- Already old	3	20	23

Reason	Regency		Total
	Majalengka (Person)	Kuningan (Person)	
- There is no capital	2	6	8
- Nothing helps	0	1	1
- There's nothing to distribute	0	1	1
- No answer	38	38	76
Total	48	87	135

Source: Primary data, processed (2020)

Based on Table 4, it can also be seen that the average age of mango farmers in Kuningan Regency is older than mango farmers in Majalengka Regency. This shows that not many young farmers are willing to enter the world of agriculture, especially mango farming. As information from several respondents, it is known that their children prefer to work in offices and in urban areas than in the agricultural sector, especially in mango farming. This is because working in an office is more perceived as having a higher prestige than being a mango farmer. Regeneration of mango farmers, especially in Kuningan Regency by young farmers who have an agribusiness spirit is very important to be able to increase mango production and farmers' interest in not only selling fresh mangoes but also processing them into processed mango products so that it will increase farmers' income from the added value generated from processed products mango. In addition, mango farming is indeed a risky type of business [15], but young farmers will be more willing to face the risk of something new [16].

Table 5. Description of Age of Mango Farmers Based on Regency

Farmer Age	Regency	
	Majalengka	Kuningan
N	121	110
Mean	50.80	57.59
Median	50.00	57.00
Std. Deviation	13.353	11.836
Minimum	23	27
Maximum	87	87

Source: Primary data, processed (2020)

Meanwhile, mango farmers who are interested in processing fresh mangoes into processed mango products have the most reason to increase their income. There are also those who have reasons to be more successful, increase knowledge, seek experience and want to be independent. These reasons may be cited by young mango farmers. Meanwhile, old mango farmers have another more visionary reason, namely that the mango processing business can be passed on to their offspring.

Table 6. Reasons of Mango Farmers Interested in Mango Processing Based on Regency

Reason	Regency		Total
	Majalengka (Person)	Kuningan (Person)	
- In order to be passed on to offspring	2	0	2
- To be more successful	7	0	7
- Increase knowledge	4	0	4
- Increasing income	29	14	43
- Looking for experience and want to be independent	2	0	2
- No answer	29	9	38
Total	73	23	96

Source: Primary data, processed (2020)

C. The Differences of Willingness to Process Fresh Mango into Processed Mango Products between Mango Farmers In Majalengka and Kuningan Regency

The results of the Mann-Whitney U-Test analysis regarding the differences of willingness to process fresh mango into processed mango products between mango farmers in Majalengka Regency and Kuningan Regency show the value of Asymp. Sig. equal to $0.000 < 0.01$

= α . This means that there is a significant difference in the willingness to process fresh mango into processed mango products between mango farmers in Majalengka and Kuningan districts at the population level (Table 7).

Table 7. Results of the Mann-Whitney U-Test Analysis

Regency	Willingness to Process Mango		
	N	Mean Rank	Sum of Ranks
Majalengka	121	137.68	16659.50
Kuningan	110	92.15	10136.50
Total	231		
Test Statistics ^a			
Mann-Whitney U		4031.500	
Wilcoxon W		10136.500	
Z		-6.059	
Asymp. Sig. (2-tailed)		.000	

a. Grouping Variable: Regency

With this significant difference, it can be concluded that one of the group has a greater willingness to process fresh mango into processed mango products than other group by comparing the mean rank value of the willingness to process mango between Majalengka Regency and Kuningan Regency. Based on Table 7, the mean rank value of willingness to process mango in Majalengka Regency is 137.68 which is greater than Kuningan Regency with a mean rank value of 92.15. Thus, it can be concluded that at the population level with a confidence level of 99%, that the willingness to process fresh mango into processed mango products by mango farmers in Majalengka Regency is greater than the mango farmers in Kuningan Regency.

IV. CONCLUSION

The majority of mango farmers in Majalengka Regency who have a willingness to process fresh mangoes into processed mango products are as much as 60.3%, while those who are not interested in processing fresh mangoes into processed mango products are 39.7%. Meanwhile, there were 79.1% of mango farmers in Kuningan Regency who did not have the willingness to process fresh mango into processed mango products and those who had the willingness to process fresh mango into mango processed products only around 20%. The old age factor was the reason most frequently cited by mango farmers in Majalengka Regency and Kuningan Regency so that they do not have the willingness to process fresh mangoes into processed mango products. Meanwhile, mango farmers who are interested in processing fresh mangoes into processed mango products have the most reason to increase their income. Then, based on the results of the Mann-Whitney U-Test analysis can be concluded that with a confidence level of 99%, that the willingness to process fresh mango into processed mango products by mango farmers in Majalengka Regency is greater than the mango farmers in Kuningan Regency at the population level.

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