

Characteristics of Mango Farmers and Factors Associated with Their Land Tenure Area

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Abstract – Mango is the main exotic fruits in West Java, Indonesia. Then, the government and farmers try to develop the agribusiness of mango. But, the productivity still fluctuates and land tenure of mango farmers are mostly narrow. The purpose of this study is to describe the characteristics of the mango farmers and factors associated with their land tenure area in Cikedung Sub-district, Indramayu Regency, West Java. The methods used in this research is a survey method with descriptive statistics analysis tool and *crosstabulation* with Chi-square test. The results showed that mango farmers in Cikedung Sub-district mostly have an experience less than 10 years, earn income from mango farming are less than 10 million rupiah/year, and the land tenure area with narrow categories (< 0.5 Ha) i.e. 49% from total respondents. The Number of mango farmer-controlled trees less than 25 trees, but its production can reach more than 700 kg/year. Factors associated with mango land tenure area in Cikedung Sub-district, Indramayu Regency, i.e. income from mango farming, the distances from mango land area to the final market, the government contribution, and the land tenure status.

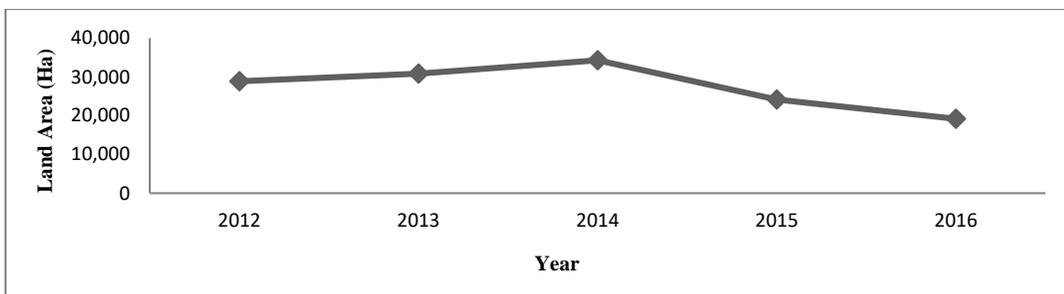
Index Terms - Factors, Land, Trees, Mango Farmers

I. INTRODUCTION

West Java province is the third-largest producer of mango in Indonesia after East and Central Java with the amount of production in 2016 reached 260,106 tons (The Central Bureau of Statistics and Dir-Gen of Horticulture, 2017). Although only occupying third producer in Indonesia, the productivity of mango in West Java is the highest fourth compared with other provinces. Beside that, the average productivity of mango in West Java in the past 5 years i.e. 11.7 tons/ha while the East Java and Central Java just 9.5 tons/ha and 10.3 tons/ha. In addition, seed production plants certified mangoes in West Java over 1 million trees, while the East Java and Central Java just 178,061 trees and 29,601 trees (Directorate of horticulture, 2015).

Nonetheless, the extensive harvesting mango in West Java in 2012 – 2016 with significant fluctuations. There is an increase in the vast harvest of 11% in 2013 – 2014, but decreased to 30% in 2014 – 2015 (Figure 1). One of factors that led to the vast harvest fluctuation i.e. socio-economic conditions of farmers and found that the old farmer categories that not productive (> 64 years) are more likely to non-accumulated his farmland by *turning land over*. In addition, farmers who have entered old age usually tend to be handed out in the form of land grants or legacy to his children (Ainurrahma, 2015). Also with the inheritance system, the farmer-owned land from one generation to the next will be narrower than before.

There are five main varieties of mango are developed in West Java, namely Arumanis, Gedong, Gedong Gincu, Dermayu, and Golek (Anugrah, 2009). Those mangoes are cultivating in Indramayu Regency, Cirebon, Majalengka, Kuningan, and Sumedang. Meanwhile, Gedong Gincu varieties from Cirebon Regency are more preferred by consumers compared to other regions.



Source: Central Bureau of Statistics and the Directorate of Horticulture
 Figure 1: Mango Harvested Area in West Java Province

Indramayu Regency is the main producer mango in West Java, but the amount of mango production is fluctuated. In the past 5 years (2012 – 2016), Indramayu Regency reached the largest mango production in 2016 with a population of 9,064 tons while the year 2012 only reached 6,851 tons (in numbers, Indramayu Regency 2013 – 2017). An average contribution to the mango production of Indramayu Regency against to national production was given for 5 years by 25% (West Java in numbers, 2013 – 2017) (Figure 2).

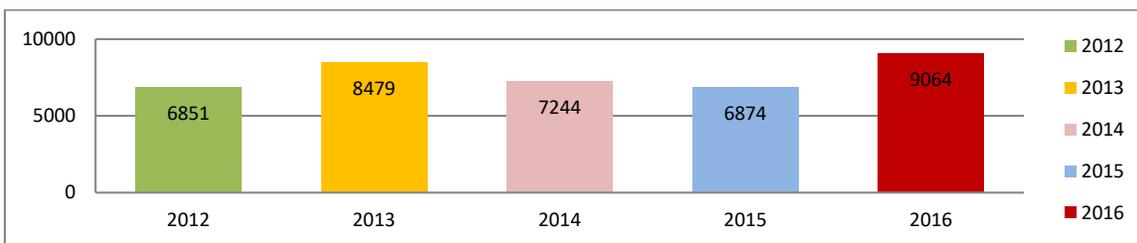


Figure 2: Mango Production (tons) in Indramayu Regency

Trend fluctuations in the number of trees and production in Cikedung subdistrict as one of the sub-district production centers in Indramayu regency is quite significant. Production of mango in Cikedung Sub-district in the year 2015 reached 523 tons but in 2016 just 102 tons which means mango production decline has occurred from the year 2015 – 2016 amounting to 80%. Not only the instability of the climate conditions that led to the mango production fluctuations but also the number of mango trees controlled by farmers. A decreasing amount of the mango trees controlled is a fairly significant happens in 2014 – 2015 i.e. amounted to 9%, and the increase also occurred in the amount of 9% in 2014 – 2016 (Figure 3).

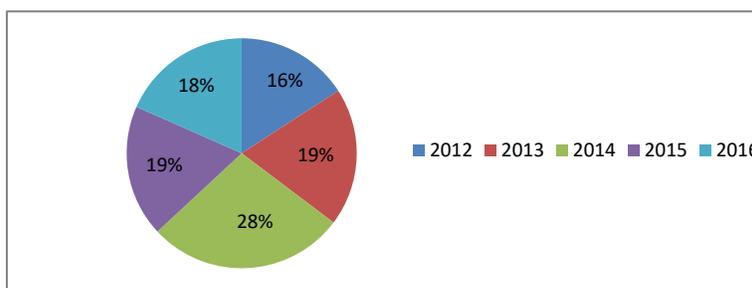


Figure 3: The Number of Mango Trees in Cikedung Sub-district

Fluctuations in the number of trees and production contribute to the income of farmers, the availability of mango supply, and the selling price of mangoes at the farm level. Also, it is known that the average income that farmers can receive from mango farming is IDR 20,100,000 - IDR 50,000,000 / year (Rasmikayati's, et al 2017). But in general, farmers' income from mango farming is still very low. In addition, the fluctuation in the number of trees also resulted in the unfulfilled demand for mangoes, especially the Gedong Gincu variety due to the limited availability of production supplies. The selling price of mangoes at the farm level will also fluctuate as a result of fluctuations in the amount of

production. This is happened because there is no simultaneously harvest time. So in the best harvest time, mango production will be abundant then selling price drops, and vice versa when the amount of mango production is limited, the selling price will tend to rise or be expensive.

In general, mango land controlled by farmers still narrow (≤ 0.5 Ha) and there are only a few farmers who control land in the medium category (0.51 - 2 Ha) also wide (> 2 Ha). This condition has been going on for years and is hereditary in almost all production center districts in West Java. So, an increasing in land control area is needed in order to going up farmers income.

Based on the background explanation above, this study aims to describe the characteristics of mango farmers and the factors related to the land tenure area of mango farmers' Cikedung Sub-district, Indramayu Regency.

II. IDENTIFY, RESEARCH, AND METHODOLOGY

Design research is quantitative research with *survey methods*. Sampling techniques are used i.e. *simple random sampling* with a respondent number as many as 130 farmers who cultivate mangoes in farmlands. Data collection is done by using questionnaires and interviews. Furthermore, the analysis of data is descriptive statistics and *cross-tabulation* by Chi-Square test.

III. RESULTS AND DISCUSSION

Characteristics of Mango Farmer Respondents

The result of this research shows that characteristics of mangoes farmer in Cikedung Sub-district are:

1. Mostly mango farmer have an experience less than 10 years
2. Their income from mango farming are less than 10 million rupiah/year
3. The majority of farmers land tenure area are in narrow categories (≤ 0.5 Ha) with their land status are private (Table 1).

Table 1: Mango Land Area Controlled by Farmers

Land Tenure Area (Ha)	Percent (%)
≤ 0.5 (Narrow)	49
0.51 – 2 (Middle)	32
> 2 (Extent)	19
Total	100

4. The total of trees tenure by farmers mostly less than 25 trees (Table 2).

Table 2: Number of Mango Trees Controlled by Farmers

Number of Mango Trees	Percent (%)
0 – 25	35
26 – 50	20
51 – 100	13
101 – 200	11
> 200	21
Total	100

This is in line with the research of Kusumo, R.A.B., E. Rasmikayati., and Mukti, G. W (2018) that the characteristics of the mango farmer consist of farmers with the average age of 52.4 years (productive), last level education of elementary school, have an experience of mango farming less than 10 years and namely a farm farmer (farmer with the possession of mango tenure trees of less than 100 trees).

Mangoes productivity is a comparison between crops (production) and land area or a number of mango trees. The productivity value can be translated as the ability of a plant or a mango tree to produce a fruit. This means that if the mangoes productivity higher than before thus indicates that the tree has been able to develop optimally with excellent maintenance by farmers.

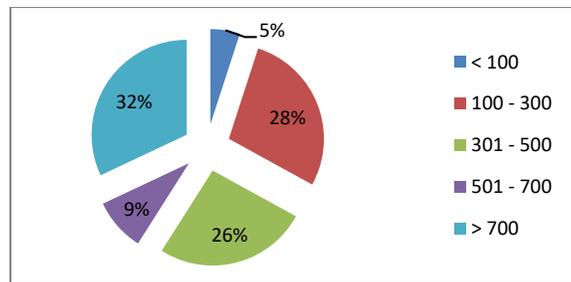


Figure 4 : Mango Productivity (Kg)

Figure 4 shows that the mango tree that is cultivated by the majority of farmers has been able to produce productivity of more than 700 kg/tree/year in their farmland. This productivity in general better than other results such as the research of Supriatna (2005) only 500 kg/tree/year. But, the result of observation by Research and Development of Agriculture (2008) has the similar mangoes productivity is around 500 – 1000 kg/tree/year.

Factors Associated with the Mango Land Tenure Area

Factors associated with the mango farmers land tenure area in Cikedung Sub-district are analyzed using the crosstabulation by Chi-square test. There is the free variable (*x*) that will be linked or associated with the variable *y* in order to obtain a conclusion. The analyzed variable *x* i.e. age, level of education, income, experience of farming, land tenure status, access to mango cultivating information, access to marketing information, access to information on climate change, access to farming credit, the government's contributions, outreach, social networks, and the distance from farm to the final market. While the variable *y* in this research is the mango farmers land tenure area.

The hypothesis that used in this study is:

H₀ : There is no relationship between the land tenure area with the variable *x*

H₁ : There is a relationship between the land tenure area with the variable *x*.

Decision criteria in this analysis i.e. if the value of Asymp Sig/significance (the p-value) < 0.05 then H₀ is rejected and otherwise, the value of Asymp Sig/significance (p-value) > 0.05 then H₀ are received.

Table 3 : The Results of the Chi-square Test Analysis for Factors Associated with the Mangoes Land Tenure Area

Variable	Asymp Sig Value	Official Statement
Age	0,648	-
Level of Education	0,359	-
Income	0,001	Correlation
Mango Farming Experiences	0,366	-
Distance from Mangoes Land Area to the Final Markets	0,002	Correlation
Social Network	0,661	-
Access to Mango Cultivation Information	0,930	-
Access to Climate Change Information	0,189	-
Access to Marketing Information	0,594	-
Access to Farming Credit	0,281	-
Government Contribution	0,005	Correlation
Outreach	0,059	-
Land Tenure Status	0,009	Correlation

Official Statement: $\alpha = 0.05$

Crosstab analysis results in Table 3 shows that the variable x as income, the distance from mangoes land area to the final market, the government contribution, and the land area status has a value of Chi-square smaller than α so that it becomes a factor that closely related to the mango farmers land tenure area. While the variables age, level of education, mango farming experiences, social networks, access to mango cultivating information, access to climate change information, access to credit of farming, access to marketing information, and outreach has no relation or relatedness significantly with the land tenure area.

The existence of significance between farmers income variable with the land tenure area means getting bigger earned income of farmers from mango farming will be increasingly greater interconnectedness of these variables with mango land area. Might be, farmers who having the extent land tenure area will have greater reduction of agriculture production facilities i.e. pesticide. This results in line with Ukoha, *et.al* (2014) and Chendo., *et.al* (2014) also found that the income variable can significantly affect to the land farmer household controlled.

Based on Table 4, known that the majority of farmers with a narrow land area category (≤ 0.5 Ha) getting income from mango farming ≤ 10 million rupiah per year. The majority of farmers with the extent land area category (more than 2 Ha even reach 25 Ha) earn income more than 100 million rupiah even up to 1 billion rupiah per year from the activity of mango farming. Whereas, for farmers with the middle mango land area category is earns income was less than 10 million rupiah/year and there are gets more than 100 million rupiah/year. That depends on the condition and productivity of mango tree in their land acquisition.

Table 4 : Farmers Income from Mango Farming in Terms of Land Tenure Area

Land Area Category	Income Level of Mango Farming (%)				Total (%)
	$\leq 10.000.000$	10.000.001–50.000.000	50.000.001 – 100.000.000	$> 100.000.000$	
Narrow	25	12	5	6	48
Middle	10	7	6	10	33
Extent	3	2	1	13	19
Total (%)	38	21	12	29	100

In conclusion, increasingly widespread the land area that is controlled by farmers, the greater income will be accepted. The analysis results also correspond to the opinions expressed by Winarso (2012) that the level of household income-based farmland, one of which is determined by how much the level mastery of the land area. The greater the land that was occupied, then the relative levels of income will be higher, and likewise vice-versa.

The distance from mango land area to the final market significantly produce decisions i.e. there is a relationship/correlation with the mango land tenure area. The analysis results are aligned with research conducted by Ukoha, *et.al* (2014) that significantly location or distance of agricultural lands may affect the mastery of farmers land household. It is assumed, the closer the distance from farm to final market it will more likely farmers with a level of mastery of the spacious grounds and uniforms, and likewise vice-versa.

Table 5 : Distances from Mango Areas to the Final Market in Terms of Land Area

Land Area Category	Distances to the Final Market (%)					Total (%)
	< 10 Km	10 – 20 Km	21 – 30 Km	31 – 40 Km	> 40 Km	
Narrow	40	4	0	2	2	48
Middle	20	6	1	1	4	32
Extent	8	5	2	0	5	20
Total (%)	68	15	3	3	11	100

Refer to Table 5, it turns out that the majority of farmers with a narrow land area category (≤ 0.5 Ha) spent the short distance (less than 10 km) from land to the final market, so do with the majority of farmers middle area and extent area category. That is because the majority of the farmers has the mango final market just to the middleman/merchant/gatherer airport located around the neighborhood a place to live. A majority of respondents to the mileage that is close enough to make travel time needed to achieve the final market is also relatively short i.e. just less than 1 hour. The condition of road from the land area to the final market is still far away and not in good condition. Even though, the distances less than 10 km, the road are in bad condition or still in soil road.

In General, the sense of government contributions can be either material or behavior. Material means, assistance, loans and related financial or government involvement in capital, while behavior is actions taken by the government directly who can give positive impact to the community. Contributions or the role of government in this study is associated with material such as price subsidies on agricultural production facilities, grants of agricultural production facilities, loan capital, seed grants, as well as the lease of land area with a low price. With the availability of assistance from the government, especially in rural communities are expected to farmers as agricultural trade is able to increase

productivity and trigger the motivation to perform optimally farming activities. The achievement of such optimization not only focuses on units of the tree/plant but also associated the development scale of farming by increasing of the land tenure area.

Based on the results of Chi-square test analysis note that government contribute variables significantly have relations with the the land tenure area. Assuming, the greater the government contribution with activities of agribusiness mango, it will increasingly influential towards the farmers land tenure area. One form of participation of the government contribution has ever been received by the small percentage of mango farmers in Cikedung Sub-district i.e. outreach and given the seed of mango (Elfadina, E.A., E. Rasmikayati., and B.R. Saefudin, 2019). Also there is often counseling from government especially about fruit fly pests. But for other contributions such as pricing and subsidies or grants, farmers claimed that it never received.

Table 6 : The Government Contribution in Terms of Land Area

Land Area Category	The Government Contribution (%)
	Never
Narrow	48
Middle	32
Extent	20
Total (%)	100

However, in Table 6 shows that all respondents with a narrow, middle, and extent land area category never received the government contributions in the form of material such as grants capital, subsidies price of agricultural production facilities, or other sources of loan capital. There are indications that the diversity category of farmers land tenure area caused by the limited participation/government support for mango farmers. This leads to farmers must work independently in the activity of mango farming. When the government increasingly vigorous support to farmers in agribusiness mango activities in particular their land, it will most likely mango land tenure area each farmer are increased.

Table 7 : Land Tenure Status in Terms of Land Area Category

Land Area Category	Status of Land Area (%)			Total (%)
	Private	Rent	Others*	
Narrow	39	4	6	49
Middle	20	7	5	32
Extent	9	2	8	19
Total (%)	68	13	19	100

Official Statement: Others*: consists of 2 land area status (example: private and rental)

There is a significant relationship between the land status with the land tenure area because the proportion of private and narrow land tenure is dominant than other status. Furthermore, farmers who have private and rent land status also greater than farmers who rent only. This is because price of lands rent is still cheap. In addition, tenant owner farmers have more diverse category of land area than the sharecroppers. The land tenure status of farmers not only affects a broad to the land tenure area but also positively correlated with their income. Manatar, *et.al* (2017) found that land tenure status for farmers has a significant relationship with the average income earned by farmers. Farmers with private land tenure status will earn different income than the sharecropper’s farmers, and likewise with others.

IV. CONCLUSION

Mango farmers in Cikedung Sub-district, Indramayu Regency ruled that mostly have an experience less than 10 years, earn income from mango farming are less than 10 million rupiah/year, and the land tenure area with narrow categories (< 0.5 Ha). The Number of mango farmer-controlled trees less than 25 trees, but its production can reach more than 700 kg/year. Factors associated with mango land tenure area in Cikedung Sub-district, Indramayu Regency, i.e. income from mango farming, the distances from mango land area to the final market, the government contribution, and the land tenure status.

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