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# Analysis Farmer Willingness to Accept and Consumer Willingness to Pay in Batu Malang East Java

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**Abstract:** ***The aims of this study are to analyze the value of farmer's willingness to accept, consumer's willingness to pay organic vegetables, as well as to analyze the factors that determine farmer's willingness to accept and consumer's willingness to pay. Based on a list of farmers, it was performed a random sample selection as many as 26 farmers. Total sample of consumers in this study are 46 respondents divided according to their respective districts. Data obtained from the survey results in Tulungrejo, Bumiaji Kota Batu and Malang in East Java. The willingness to accept of the value analysis and value of willingness to pay using analysis tool of contingent valuation method by using the bidding game. Furthermore, multiple linear regression analysis is used to analyze the factors that influence the willingness to accept and willingness to pay. Factors affecting farmers' willingness to accept are the age of farmers, income, land area, the number of family members, and length of service. Whereas, factors affecting consumer's willingness to pay are income, gender consumer, age, the number of family members. Of all the above factors affecting willingness to accept significant are the income of farmers and land area. While the factors which affect the willingness to pay are income and the number of family members.***

**Keywords:** willingness to accept, willingness to pay, farmer, consumen

## 1. Introduction

Horticulture today have an important role in economic growth in Indonesia as well as a source of improving the welfare of farmers. Horticulture provides enhanced contribute significantly to the GDP (Gross Domestic Product), ie in the period 2003-2008, an increase of 32.9% from Rp 53.89 trillion to IDR 80.29 trillion rupiah (BPS 2014). Meanwhile, the agricultural sector contributed to GDP by 11:36%, horticulture accounted for 16% with the increase in the proportion of 68.6% in the period 2012-2013 (BPS 2014).

Vegetables as a leading commodity plateau in Indonesia has significance as a source of vitamins and minerals in addition also as an alternative source of carbohydrates food diversification Indonesia. This was followed by a shift in food consumption patterns in Indonesia, where a decline in the consumption of rice as a staple food, switch to the consumption of vegetables and fruits. These factors are also reinforced with statistical data, where a decline in per capita consumption of cereals and tubers in the period 1999-2010 by 13% and 39%, accompanied by an increase in per capita consumption of vegetables and fruits by 25% and 20% in the period the same time (BPS 2011).

International Federation of Organic Agriculture Movements (2005) which is an organization for the organic movement worldwide, that organic farming is a system of agricultural production which is a holistic and integrated approach, which optimizes the health and productivity of agro-ecosystem naturally so as to produce food and fiber are sufficient, qualified and sustainable. The main goal of organic agriculture is to provide agricultural products, especially food that is safe for the health of producers and consumers and does not damage the environment. Healthy lifestyle has thus been institutionalized internationally, which requires a guarantee that agricultural products should be safe to consume beratribut (food safety attributes), high nutrient content (nutritional attributes) and environmentally friendly (eco-labeling attributes).

The development of organic farming in Indonesia began in the early 1980s were marked by the increase of organic agricultural land area and number of organic producers Indonesia from year to year. Based on data from Statistics Indonesia Organic Farming (spoi) issued by Indonesian Organic Alliance (AOI) in 2009, it is known that the total area of organic farming in Indonesia in 2009 was 231,687.11 ha. The area is covers a land area of certified, ie 97351.60 ha (42 per cent of the total area of organic farming in Indonesia) and the area of land that is still in the certification process (pilot project AOI), which is 132,764.85 ha (57 percent of total area of organic farming in Indonesia).

The total area of organic farming area in 2008 is much larger than in 2009, which is about 235,078.16 ha. Meanwhile, the total number of perpetrators of organic farming recorded in 2009 was 12 101 producers that consists of 9628 manufacturer certified, while the rest are 2,383 manufacturers of non-certified, 10 manufacturers PAMOR (Quality Assurance Organic Indonesia, which is one form of the certification system of participation), and 80 manufacturers in the certification process (AOI, 2011). In Organic Agricultural Statistics Indonesia in 2010 it appears that certified organic producers reached 9 805. This amount is higher than that have not been certified only 3817.

Kota Batu is one of the main cities in East Java province was situated in kakai active volcanoes such as Bromo Tengger Semeru. Such climatic conditions are very suitable for the development of agriculture especially horticulture. Increasing

consumer awareness on health prompted the government Batu perform limited application (pilot project) in the form of vegetables and fruits with the slogan Go Organic Stone. The results of the development of organic agriculture is determined by the willingness of farmers to adopt organic farming technology. But the reality, organic agriculture in underdeveloped and still very few products produced (Myarowani 2012). Farmers will be willing to change the organic farm if the application is able to provide receipts are greater than non-organic farming technology. Research suggests that organic farming provides greater profits and real impact on farmers' income (da Costa 2012). Application of organic farming that farmers consider the additional cost and potential benefit in accepting and adopting the technologies introduced (Manikmas 2012).

## 2. Method

Data collected through direct interview to the respondents using a questionnaire tools. The sampling method is done by first making a list of farmers practicing organic farming non veg obtained from farmer groups. Based on the election list of farmers random sample number of samples of 26 farmers.

Sampling was done by purposive by selecting respondents in the population of the city of Malang. Criteria respondents are consumers who have purchased organic vegetables at least once aged 17 years and over (judged mature enough to be interviewed and filled out questionnaires) and in a family group only one person who is the respondent in the study in order to answer the questionnaire does not affect each other. The number of samples in this study were 46 respondents were divided according to their respective districts.

Data processing and analysis procedures used are deskripstif analysis and multiple regression analysis and the CVM. Software analysis tools such as Microsoft Excel 2013 and SPSS version 22. The analytical tool used to determine the variables that affect the WTA/WTP is Multiple Regression Analysis.

$$E(WTA/P)= \sum_{i=1}^{n} W_i Pft \text{ (Hannamen 1989)}$$

where: E (WTA / P) = the average allegations WTA / P
Wi = lower class boundary WTA / P i-th grade
PFI = relative frequency of the class in question
n = number of class (interval)
i = class (interval) WTA / P; i = 1, 2, 3

Magnitude WTA didugakan by farmers and WTP didugakan by consumers would be different depending on the factors that influence it. In this study the factors that influence the WTA / WTP formulated in the following models:

$$WTA = (b_0+b_1X_1+b_2X_2 +b_3X_3+b_4X_4+ e)$$

WTA = willingness to accept
$X_1$ = vegetable farm receipts
$X_2$ = age of farmers
$X_3$ = land
$X_4$ = the number of family members

$$WTP = (b_0+b_1X_1+b_2X_2 +b_3X_3+b_4X_4+e)$$

WTP = willingness to pay
$X_1$ = consumer income
$X_2$ = level of education
$X_3$ = age
$X_4$ = the number of family members

## 3. Result and Discussion

### 3.1 Willingness to Accept

The results showed that the average minimum WTA vegetable farmer for every kilogram of potatoes per kilogram commodity its USD 10 269; commodity red chili Rp 27 019 per kilogram. The result of the calculation of average WTA for each commodity are presented in Table 1

**Table 1:** Comparison of Actual Rated WTA

| Product | Average WTA (Rp/kg) | SD | Actual Price (Rp) | Difference | |
|---|---|---|---|---|---|
| | | | | Rupiah | % |
| Potato | 10.269 | 22.2 | 5 | 4.269 | 34.5 |
| Red Chili | 27.019 | 6.8 | 25 | 2.019 | 3.8 |

Table 1 shows the difference between the price on the potato growers offer price to the actual price at the farm level is very big difference, reaching 34.5%. It is influenced by the land and land tenure farmers. Potato plants are generally cultivated a more difficult one of which required special handling is also fairly large area of land that remedy to obtain optimal results (Kiloes 2015). The attitude of farmers who do not question their farming businesses in making the farmers dependent on pengijon comes to farmers and buy all the commodities in the farmers market as collateral. Plants are planted can not be separated from the culinary culture of society Malang, the potatoes are usually indispensable for food ingredients ahead of Eid and fasting, the price of potatoes at the time soared in addition to procedures for cultivation is still more difficult and many are purchased so that the farmers set the price more ie, the difference is 34.5% higher. Medium red chili less are preferred and economic value is lower than the price of red chili sauce typical of East Java. This causes farmers to choose the offering price and the difference between the actual price WTA lower at only 3.8%.

### 3.2 Willingness to Pay

This study aimed to analyze the willingness of consumers to pay the minimum amount paid by the consumer is willing organic vegetables for additional benefits (incremental benefit) obtained by consuming organic vegetables. Comparators are used in the present study is an inorganic prices of vegetables sold in supermarkets. The results showed that out of 46 respondents was 36.9% of respondents are not willing to pay.

The results showed that the maximum average consumer WTP for each kilogram of organic vegetables red chili commodities worth 34000.00 rupiah per kilogram; Commodity potatoes per kilogram for 21 566 rupiah. The result of the calculation of average WTP for each komoditis are presented in Table 2.

Table Comparison of Actual Rated WTP

| Product | Average WTA (Rp/kg) | SD | Actual Price (Rp) | Difference | |
|---|---|---|---|---|---|
| | | | | Rupiah | % |
| Potato | 21.566 | 22.2 | 16.000 | 5.566 | 14,8 |
| Red Chili | 34.000 | 6.8 | 32.000 | 2.000 | 3,03 |

The results showed that the maximum average consumer willingness to pay for each kilogram of organic vegetable commodity red chili at Rp 34,000 per kilogram; Commodity potatoes per kilogram for Rp 21 566. The result of the calculation of average WTP for each komoditis are presented in Table 2.
In Table 2 shows the prices of all commodities in accordance with consumer demand. On the difference between the offer price of potato farmers on the actual prices at the consumer level are very big difference, reaching 14.8% profit potatoes. Capturing data in Table 2 coincides with Ramadan and ahead of Eid. The amount of demand causes the price of potato increased according to the demand. While the red chili commodity consumption rate per day had the lowest among the five biggest provinces in Java namely Jakarta, West Java, Central Java, Yogyakarta and East Java number of 30.50 tons per day (Saptana 2012). This study also looks at and average WTP and the actual price at the consumer level has a difference of 3.03% to the offer price of consumer WTP. Medium red chili less are preferred and economic value is lower than the price of red chili sauce typical of East Java.

### 3.3 Analysis of Factors Affecting Farmers Willingness to Accept

This analysis is used to determine the factors that affect the value of the WTA set four independent variables that affect the dependent variable is an assessment of the age of the farmer, the farmer acceptance of one harvest, the land held, and land ownership, while the dependent variable is the value WTA respondents.

**Table 3:** Factors affecting farmers willingness to accept

| | Potato | | | Red Chili | | |
|---|---|---|---|---|---|---|
| Variable | Koef | Sig | VIF | Koef | Sig | VIF |
| Constant | 22964.297 | 0.000 | | 26962.340 | 0.000 | |
| Age | 20.050 | 0.850 | 1.184 | 116.297 | 0.327 | 1.184 |
| Vegetable farm receipt | -0.012 | 0.001 | 1.601 | -8.479E-5 | 0.048 | 1.601 |
| Land | -0.009 | 0.003 | 1.661 | -0.002 | 0.012 | 1.661 |
| Family member | 30.402 | 0.224 | 1.459 | 34.676 | 0.345 | 1.034 |
| R2 | 46.7% | | | 45.9% | | |
| Adj R2 | 35.6% | | | 35.6% | | |

From Table 3 $R^2$ value of 46.7% this means that the diversity WTA potato farmers to 46.7% can be explained by the model, the rest is explained by other variables outside the model. While the diversity of farmers on the WTA red chili that is 45.9% according to the value of $R^2$ rest is explained by other variables outside the model. In potato diversity value in this study amounted to 45.9% and the rest is $R^2$ explained by other variables outside the model. Red chili has a value of $R^2$ in this study amounted to 45.9% and the rest is explained by other variables outside the model. The independent variable over the real impact on the model that is the status of land ownership and farm receipts in one harvest. Assuming examination to test the multicollinearity problem is based on the value of VIF, in the above table each independent variable showed the value of less than 10 (VIF <10), the results indicate no violations multikolinieritas. Variable regression coefficients reception on potato 0.005 with a significance level of a two-sided t-test of 0000. This indicates that the level of farmers' income does not appeal to the willingness of farmers to accept.

Variable income had a negative sign to the value of the coefficient is negative (-) with a value of 0.012. This means if income increases by one unit (rupiah), then the value will decrease WTA given Rp 0,012. Respondents with lower incomes require additional revenues to cover the higher cost of everyday needs. Variable income allegedly real impact on the model, because the results of the survey showed monthly incomes of farmers tend to vary depending on commodity planted. Therefore, to move conventional agriculture if farmers have a low income will be very difficult, so the WTA can be used for the minimum value to be received by farmers if producers farm organically. It can be concluded that the lower the income level WTA value that will be given will be higher (Hong Wang, 1996). Variable land area has a negative sign to the value of the coefficient is negative (-) with a value of 0.009. This means that if the land area increased by one unit (m2), then the WTA given value will increase by 0009. Respondents who have a large area to be associated with harvest revenues were great too (Vanslembrouck 2002). If respondents with low income then require additional revenues to cover the higher cost of daily necessities (Bertoni 2008). In the study area showed extensive farmers have diversified among other farmers therefore the lower the income level of the WTA given value will be higher.

### 3.4 Analysis of Factors Affecting Willingness to Pay Consumers

In this study, there are four independent variables consisting of age, marital status, income, number of family members, while the dependent variable is the value of WTP respondents.

**Table 4:** Factors affecting the consumer's willingness to pay

| | Potato | | | Red Chili | | |
|---|---|---|---|---|---|---|
| Variable | Koef | Sig | VIF | Koef | Sig | VIF |
| Constant | 14538.731 | 0.000 | | 14538.731 | 0.003 | |
| Age | 112.122 | 0.850 | 1.118 | 112.122 | 0.336 | 1.118 |
| Married Status | 3.368 | 0.001 | 1.161 | 593.368 | 0.766 | 1.161 |
| Consumer income | 0.005 | 0.003 | 1.041 | 0.005 | 0.000 | 1.041 |
| Family member | -4.234 | 0.224 | 1.023 | 3.234 | 0.001 | 1.023 |
| $R^2$ | 57.1 % | | | 74.1 % | | |
| *Adj* $R^2$ | 53.9 % | | | 72.1 % | | |

From Table 4 it can be seen that the value of $R^2$ in this study amounted to 57.1%. This means that the value of diversity WTP consumer respondents to the potato that is a 57.1% can be explained by the model, the rest is explained by other variables outside the model. While the independent variable

commodity red chilli in Table 4 significantly affect models of tenure and farm receipts in one harvest. Assuming examination to test the multicollinearity problem is based on the value of VIF, in the above table each independent variable showed the value of less than 10 (VIF <10), the results indicate no violations multikolinieritas. The significance value is less than alpha 0.05 which shows that interaction level attitude with marital status and income levels together have an effect on consumer willingness to pay.

Variable regression coefficients potato revenues in 0005 with a significance level of a two-sided t-test of 0000. This indicates that the level of income a positive effect on willingness to pay. These results indicate that the higher the level of a person's income, the willingness to pay for organic products will increase.

While the value of regression coefficient on the income variable commodity red chili 0.005 significance level test two sides 0.003. This indicates that the level of income a positive effect on willingness to pay. These results indicate that the higher the level of a person's income, the willingness to pay for organic products will increase. In the study area the majority of respondents are willing to pay more for potato and red pepper have an income above 3 million. With revenue of the income showed great influence on consumers' willingness to pay more towards commodity. Variable marital status of 3,368 consumers significant levels of two-sided t-test of 0001. This indicates that the positive effect of marital status on willingness to pay. These results indicate that when someone has been doing weddings the willingness to pay will increase. The majority of respondents in this study have been married status, this will affect household expenditures than are single. According to Laroche et al (2001) showed a relevant source for factors affecting willingness to pay more reserved on environmentally friendly products. Factors that are classified into five categories; demographics (age, gender, income, education level and employment status), knowledge, values (individualism, kolektiviktas, security and pleasure), attitude (interests friendly to the environment) and behavior (awareness of environmental issues. Meanwhile, according to Boztepe (2012), environmental awareness, part of green products, green promotional activity and prices may be implicated in the green purchasing behavior of consumers in a positive way, even though the effect on the demographic characteristics of the model applied.

## 4. Conclusion and Recommendation

The average value of each commodity WTA per kilogram among others Chips Rp. 10 269, and a number of Red Chili Rp. 27 019. The average value of each commodity WTP consumer level per kilogram is potato Rp. 34,000; Red chili Rp. 21 566. Factors affecting the WTA farmers, among others; age of farmers; income; land area; the sheer number of family members; tenure. While the factors affecting WTP is consumer income; the sex of the consumer; age; the number of family members. Of all the above factors affecting willingness to accept significan is the income of farmers and land area. While the factors that influence the willingness to pay, among others, income and number of family members. Results have been obtained memalui study of vegetable growers and consumers of organic vegetables, suggestions can be submitted in the development of organic farming in terms of producers and consumers. Strive to increase awareness of farmers and consumers about the importance of protecting the environment through education market. For further research is expected to further research on how to market linkages organic and non organic vegetables organic vegetables in order to obtain information about the factors that affect farmers or consumers unwillingness to accept or pay.

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