International Journal of Agriculture Innovations and Research
Volume 4, Issue 4, ISSN (Online) 2319-1473
Manuscript Processing Details (dd/mm/yyyy) :
Received : 15/01/2016 | Accepted on : 02/02/2016 | Published : 06/02/2016

# Indonesian Clove Growth and Affecting Factors of Indonesian Clove Exports In The International Market

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***Abstract* – The aim of this research was to determine the growth of Indonesian clove exports, land use, productivity and the dollar rate exchange Amerika States (US) as well as to determine any factors that affect the volume of exports of Indonesian clove. The results showed an average growth rate of land per year was -0.89%. Clove productivity growth rate of 3.40% annually, while the exchange rate growth of the US dollar against the rupiah from year 1993-2012 fluctuative with an average growth amounted to 10.66 percent. R-square values showed that 77% of the variation of the dependent variable is the export volume of cloves in Indonesia can be explained by the independent variables namely land area (X1), Productivity (X2), and the US dollar exchange rate (X3). So the factors that affect the export of Indonesian cloves include land use, productivity and the exchange rate of the US dollar.**

***Keywords* – Export, Cloves, Land Use, Productivity, US Dollar Exchange Rate**

## I. INTRODUCTION

One of the activities that has an important role in the economy of a country is international trade, so that international trade should be continue to pursued in order to seize the opportunities. An International trade partnership helping a country to its development, particularly in promoting the export of the country. The greater of exports value in a country, the better the country's revenue.

International trade in this research are specified on a single commodity to measure the factors that influence the fluctuating value of exports in Indonesia. The authors take the cloves which is a typical Indonesian plantation commodities.

Clove or scientific language known by *Eugenia aromatikal/ Syzigium*, L. is one of the important crop plantations commodity. This plant is native to Indonesia precisely from the area of Banda in Maluku islands (Conti in Ruhnayat, 2002). Cloves as a income source of farmers and crops plantation which is the main source of raw material in the cigarette industry. In addition to the negative effects of smoking on health, cigarette role in the national economy is very significant, among others estimated contribute around Rp 23,2 trillion by forecast Rp. 29 trillion in cigarette tax revenues. Labor associated directly or indirectly with the cigarette industry, the agricultural sector, cigarette industry, and commerce, as well as the informal sector of about 6 million workers (Deptan, 2007).

Prospects and the potential of clove plant in Indonesia will be higher needs considering domestic and International cloves markets increased. Since 1996 Indonesian clove produce has decreased dramatically due to uncertainty price. In 1995 the national clove production reached 90.007 tons, then fell to 52.903 tons during the small harvest in 1999 and only reached 70.009 tons in the harvest of 2002 (Ditjenbun, 2004). On the other side, the clove need for cigarettes rose an average of 92.133 tons / year (GAPPRI, 2005). The following Table 1 shows the countries that became an export country of Indonesian clove.

Table 1. Indonesian Clove Export to 10 biggest Country 2006 - 2011

| No | Country | Value (US$ '000) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
| 1 | India | 9433 | 11288 | 827 | 1011 | 1019 | 6671 |
| 2 | Vietnam | 307 | 1017 | 97 | 551 | 3281 | 2376 |
| 3 | Singapore | 6631 | 9728 | 547 | 143 | 1239 | 1428 |
| 4 | Egypt | 105 | 137 | 88 | 30 | 197 | 149 |
| 5 | United State | 367 | 811 | 1079 | 607 | 1016 | 1312 |
| 6 | China | 542 | 6 | 26 | 11 | 21 | 33 |
| 7 | Arab Saudi | 2371 | 4019 | 1248 | 1031 | 2615 | 1304 |
| 8 | Netherland | 158 | 280 | 72 | 148 | 129 | 235 |
| 9 | Pakistan | 477 | 1569 | 41 | 135 | 455 | 455 |
| 10 | Malaysia | 658 | 11281 | 1281 | 645 | 478 | 428 |
| | Others | 2482 | 1936 | 1936 | 1274 | 2129 | 1914 |
| | Total | 23533 | 7251 | 7252 | 5586 | 12581 | 16306 |

*Source : Central Bureau of Statistics, processed 2015*

Currently, Indonesia is the country's largest cloves producer in the world. In 2012 the production of clove in Indonesia reached 79.25 thousand tons, while the production of cloves in the world in the same year reached about 111.65 thousand tons, contributing 70.99% to total world clove production, while for the ASEAN, Indonesia contributed 99.66% (FAO, 2012). Clove is a superior plant and one of the 15 commodities are in priority handling in

plantation development. Clove is also a source of revenue for the State.

The problems arising in this research to determine the extent of land development, productivity, US dollar exchange rate and export of Indonesian clove and the factors are affecting the export of Indonesian clove.

## II. Research Methods

This research is a study on the growth of Indonesian clove and the factors that affect the export of Indonesian clove in the international market. Determination the area of the research done intentionally (purposive sampling) given the level of cloves in the world still needs to be one product that is favored by lovers of cloves in the world.

This research is a micro-economy that uses secondary data. Secondary data is data obtained directly from the institutions and from research results related to this research. The data used is data linkage period (time series) production, price, clove domestic consumption from 1990 to 2012.

### *Method Of Data Collection*

Data sources in this study were taken from the Central Bureau of Statistics publicity, the Council of Indonesian clove, Directorate General of Plantation, and other relevant agencies. In addition, this research is also supported by documentation method which is related to the required secondary data research by using previous studies, literature, library books, or from a newspaper that is useful to add data and also broaden their horizons.

### *Method of Data Analisys*

Data analysis methods used for this study are:

### *Trend Analysis*

This analysis is used to look at the trend offers clove from year to year. For the movement used the equation straight line trend which formulation is as follows:

$$\mathbf{Y = a + bx}$$

Where:
Y = offers cloves, in tons
a = intercept
b = slope or tilt
x = year

### *Multiple Linear Regression*

Multiple linear analysis is used to determine the direction of the relationship between independent variables with the dependent variable, whether of each variable independently associated positively or negatively, and to predict the value of the dependent variable, if the value of independent variable increases or decreases, the data used is usually scale interval or ratio.

$$\mathbf{Y = \beta 0 + \beta 1\ X1 + \beta 2\ \beta 3\ X2 + X3 + \beta n\ Xn}$$

Testing criteria based $F_{calculate} < F_{table}$ is as follows:

1. If $F_{count} < F_{table}$: H0 received significant independent variable does not affect the dependent variable.
2. If $F_{count} < F_{table}$: then H0 is rejected, which means that the independent variable does not affect the dependent variable to determine what variables that influence independent t test:

$$\mathbf{thit} = \frac{ai}{Seai}$$

Where:
$A_i$ : regression coefficient
$Se_{ai}$ : Standard deviation of $_{ai}$
Testing rules based $t_{count}$ and $t_{table}$:

1. If $t_{count} < t_{table}$: hence Ho accepted meaning that partially independent variable has no effect on the variable depanden.
2. If $t_{count} < t_{table}$: then Ho is rejected, which means that the partial independent variables have an influence on the variable dependent.

Testing rules based significance level:

1. If sig > 0.05 then H0 accepted
2. If sig <0.05 then the H1 is rejected

## III. Result and Discussion

### *Indonesian Cloves Growth*

During the period 1993 - 2012, the growth of Indonesian cloves exports in showed significant fluctuations. In 1993, the total commodity exports of Indonesian cloves amounted to only 700 tons and increased sharply in 1998 to 20 157 tons, but decreased again thereafter 1999 to 1.776 tons and increased again in 2003 which amounted to 15.688 tons, 11.270 tons 2006 and 14.094 tons in 2007. The following data illustrate the comparative growth and production of export commodities cloves in Indonesia as follows:

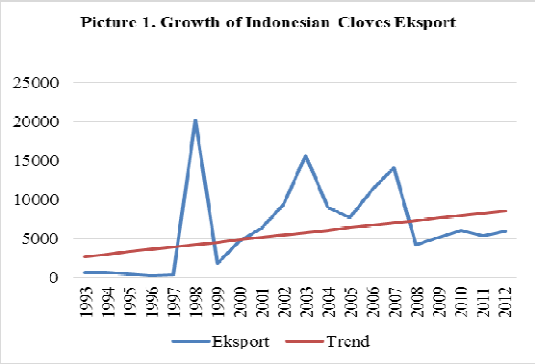
Table 2. Export Amounts and Cloves Production in Indonesia as long 1990 – 2012.

| Year | Expor | Production |
|---|---|---|
| | (Ton) | |
| 1993 | 700 | 67366 |
| 1994 | 670 | 78379 |
| 1995 | 490 | 90007 |
| 1996 | 230 | 59479 |
| 1997 | 365 | 59192 |
| 1998 | 20157 | 67177 |
| 1999 | 1776 | 52903 |
| 2000 | 4.655 | 59.878 |
| 2001 | 6.324 | 72.658 |
| 2002 | 9.399 | 79.009 |
| 2003 | 15.688 | 76.471 |
| 2004 | 9.060 | 73.837 |
| 2005 | 7.680 | 78.350 |
| 2006 | 11.270 | 61.408 |
| 2007 | 14.094 | 80.404 |
| 2008 | 7.251 | 70.535 |
| 2009 | 5.142 | 81.988 |
| 2010 | 6.008 | 98.386 |
| 2011 | 5.396 | 72.207 |
| 2012 | 16.305 | 72.246 |

*Source: Food Agricultural Organisation, edited 2015*

In represented graphically, the ratio of exports to changes in the national clove production during the period 1993 to 2012 is as follows:

International Journal of Agriculture Innovations and Research
Volume 4, Issue 4, ISSN (Online) 2319-1473




*Source: Central Bureau of Statistics, processed 2015*

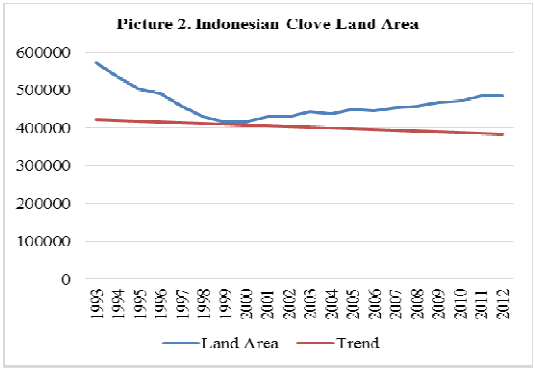
Picture 1, shows the clove fluctuating commodity growth exports from 1993 through 2012 during the vulnerable period between 1993 to 1998, the growth in commodity exports of Indonesian clove showed an increasing trend caused by the harvest that led to over supply for domestic needs so much to be marketed Internationally. But in the subsequent decline precipitously as the implications of the cloves export price weakening in the international market as a response to the over supply in the previous year harvest, and the decline continued until 2002.

The exports increase happen in 2003, then decreased again until 2005. In 2006 and 2007 Indonesia cloves exports has increased again, following the improvement in the world economy so that boosted the exports of Indonesian clove commodity. Towards the beginning of 2008, the decline in export demand in the international market commodity clove happen because it is influenced by the global crisis triggered by the crisis of the United States due to collapse of its financial institution Lehman Brothers. US crisis led to the weakening of the value of the Rupiah, decrease of income, which in turn has implications for the drop in export demand Indonesian clove. In the next period, ie 2009 to 2012, the growth of Indonesian clove exports in International market, practically not increase significantly . It is caused by various factors, which are still in recovery phase of the world economy and the decrease productivity clove farmers in Indonesia.

Indonesia is one of the world's largest cloves producer. The data show that 2/3 of cloves in the world is produced in Indonesia which amounted to 80 tons or 73% (in 2007) and reached 98 thousand tons or 79% (in 2010) of the total world production of cloves. In 2007 countries who producing clove besides Indonesia is Madagascar which produces as much as 11 thousand tons (10%), Tanzania 9.9 thousand tons (9%) and Sri Lanka as much as 3 thousand tons (3%).

Indonesian cloves produced almost entirely for the tobacco industry in the State. According to data from the production of clove years 1993 - 2012 ranged between 67 thousand to 72 thousand tons, with an average of 72.703 tons / year. Meanwhile, during the period 1990 to 2012, the development of Indonesian clove commodity exports showed significant fluctuations. In 2000, Indonesian total exports of clove commodities amounted to only 4.655 tons and increased sharply in 2003 to 15.688 tons, but again decreased in 2004 to 9.060 tons. Increased re-occur in the next two years, amounting to 7,680 tons in 2005 and 11.270 tons in 2006. The volume of cloves exports are also affected by the land, the more land to produce, the more of production, so could increase the volume of clove exports.

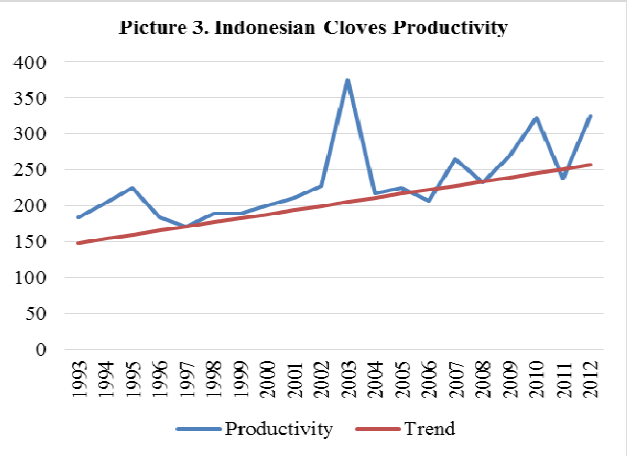
In the period for 1993 - 2012 the general growth pattern of the total cloves area in Indonesia fluctuate but tend to increase. Average growth in acreage over the period of 0.40% per year where the total area of Indonesian clove on 2000 was 415.598 thousand hectares and then in 2012 to 485.192 thousand hectares. In 2000 the total area of the plant produces cloves reached 59.878 thousand tons per hectare and in 2012 amounted to 72.246 thousand tons per hectare. When viewed from the status, the clove acreage in Indonesia is dominated by smallholder plantations (PR). In the period of 2000 - 2012, also an increase in the amount 0,45% per year. Following the growth trend of the land area of cloves in Indonesia:




*Source: Central Bureau of Statistics, processed 2015*

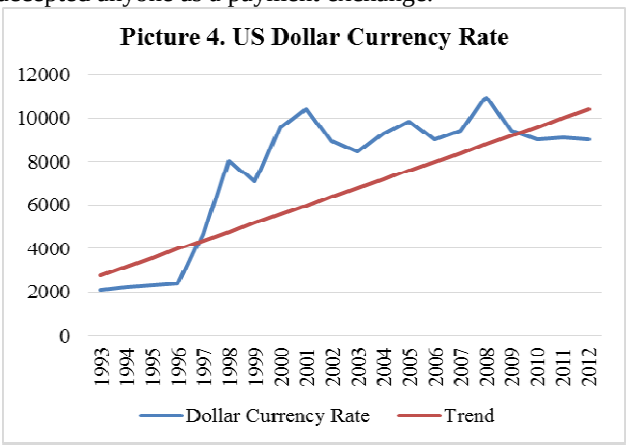
Based on the picture 2 it can be seen that the area of land for clove decrease from 1993 to 2012. The land area in 1993 reached 571.047 hectares, while in 2012 the land area is only about 485.192 hectares of clove. However, a decrease in land area does not render a barrier for Indonesia to export commodities to foreign cloves. Based on the above chart we can see that in the years 1993-2000 decreased land area ultimately reduce the amount of production. In 2001 - 2012 an increase in the land area of cloves, but in 2004 and 2006 decreased by 0.92% land area. The average level of decreased of the land area is -0.89% annually. A decrease in land area clove is caused of the price cloves which sometimes low/cheap because the cloves supply too much and many farmers clearing their land that had a clove transformed to profitable land at that time like chocolate, coffee, and others.

Beside the export clove land area, In addition also influenced by clove productivity. In general, the productivity of Indonesian clove is very volatile but tends to increase. Although more than 90% cloves in Indonesia belongs to the people who are less well maintained. During the period 1993 to 2012, the average growth rate of productivity amounted 3,40% annually. The highest productivity period during 1993-2012 occurred in 2003 in the amount of 374.777 kg / ha. Indonesian clove productivity growth will be illustrated in the following Picture 3:




*Source: Central Bureau of Statistics, processed 2015*

Another factor affecting the export of cloves in Indonesia is the exchange rate that could encourage an increase in the price of cloves and clove export volume. Dollar exchange rate relationship with the export of Indonesian clove. The exchange rate is one of the important indicators that influence the stability of the economy. US dollar exchange rate is used as a currency of international standards due to the stability of the value of the high currency and can be easily traded and can also be accepted anyone as a payment exchange.




*Source: Central Bureau of Statistics, processed 2015*

The growth of the exchange rate of the US dollar against the rupiah from years 1993 - 2012 with an average growth amounted to 10.66%. Based on the Picture 4, the decreaseo of US dollar exchange rate in 2010, this is because the Indonesian economy is getting better after the economic crisis.

### *Discussion and Analysis of Results*

To determine the relationship between the independent variable ie land area, the productivity and the exchange rate of the US dollar against the dependent variable is the export of Indonesian clove then used multiple linear regression. Here are the results of the analysis:

Table 3. Summary[b] Model

| Model | R | R Square | Adjust R Square | Std. Error |
|---|---|---|---|---|
| 1 | 0.878[a] | 0.770 | 0.709 | 0.7293 |

a. Predictors : (Constant), X1, X2, X3
b. Dependent Variable : Y

Based on Table 3, it can be seen that the number of correlation (R) is 0.878 which shows that the number of positive correlation and the value is> 0.5, which means a very strong relationship between variables and proportional. While the R2 value of 0.770. It shows that 77% of the variation of the dependent variable is the export volume of indonesian cloves can be explained by the independent variable is the land area (X1), Productivity (X2), and the US dollar exchange rate (X3). While the rest of 23% is explained by other variables outside the model used in the study.

### *Levene's test Test (Test F)*

To determine the independent variables in the study affect to the dependent variables, or in whether the variable land area (X1), productivity (X2), and the US dollar exchange rate (X3) together affect the amount of exports of Indonesian clove, then used Anova or F test. Based on the analysis using Multiple Linear Regression with SPSS version 16, it obtained the following results:

Table 4. Analysis of Variance (ANOVA[b])

| Model | Regression | Residual | Total |
|---|---|---|---|
| Sum of Squares | 26.786 | 7.979 | 34.766 |
| Df | 4 | 15 | 19 |
| Mean Square | 6.697 | 0.532 | |
| F | 12.588 | | |
| Sig | 0.000[a] | | |

a. Predictors : (Constant), X1, X2, X3
b. Dependent Variable : Y

Based on the analysis of variance showed that the significance probability value in the column is 0.000a. This probability value is less than the value of α = 5% (0.05). This shows that the independent variables used in this study, namely the land area (X1), producer prices (X2), productivity (X3) and US dollar (X4) jointly significant effect on the dependent variable is the export volume in Indonesia with a confidence level of 95%. Based on the value $F_{count}$ and $F_{table}$ note that the value $F_{count}$ 12.588 and $F_{table}$ value is 3.06, so the value of F count> F table, meaning the independent variables jointly affect the dependent variable.

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Table 5. Coefficients[a]

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| (Constant) | 27.297 | 28.376 | | 0.962 | 0.352 |
| Land Area (X1) | -9.738 | 3.135 | -.591 | -3.106 | 0.006 |
| Productivity (X2) | 3.300 | 1.309 | 0.511 | 2.520 | 0.021 |
| Dollar Exchange Rate (X3) | 1.976 | 0.284 | 0.854 | 6.967 | 0.000 |

a. Dependent Variable: Y

Making the multiple regression equation can be done by interpreting the figures in the unstandardized Coefficients particular column B under the existing formula equation model, the model of the equation can be written as follows:

$Y = \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3X3$

$Y = 27{,}297\text{-}9738\ X1 + 3{,}300\ X2 + 1{,}976\ X3$

Based on these equations, it means that constanat, the equation constant value of 27.297 which showed that if each of the independent variables (X1, X2, X3) is constant or does not change during the analisys period, it will still be an increase in export volume of 27.297% per year. Land area (X1) variable has a negative value of the regression coefficient indicates that there is a negative influence on the land area to the number of Indonesian clove exports. This illustrates that if there is an increase of 1 percent of land area, the number of cloves exports decreased by 9.738% percent, assuming that the other independent variables held constant. Based $t_{count}$ and $t_{table}$, it is known that $t_{count}$ the land area is at -3106 and the significance of 0.006, while the known value of df $t_{tabel}$ is 2.13 to 5%. This indicates that $t_{hitung}$ value does not lie between ± $t_{table}$ value, and the probability of <0.05, meaning that the variable land area is partially affect the export volume of Indonesian clove.

Productivity variable (X2) has a positive regression coefficient that is equal to 3,300. The positive coefficient values indicate that there is a positive and significant impact on the productivity of cloves to the number of Indonesian clove exports. This illustrates that if there is an increase in productivity by 1 percent, then the number of clove exports will increase by 3,300 percent, assuming other independent variables held constant. Based $t_{count}$ and $t_{table}$, it is known that $t_{count}$ the price level producer is equal to 2,520 and significance of 0.021, while the known value of df $t_{tabel}$ is 2.13 to 5%. This indicates that the value does not lie between ± $t_{coun}$ and $t_{table}$ value, and the probability of <0.05, meaning that the variable productivity partially affect the export volume of Indonesian clove.

Based on this it can be seen that the export volume of cloves in Indonesia is very dependent on the productivity of cloves in Indonesia because Indonesia is the world's largest cloves producer. This is because the export commodities offer a State derived from the production are able to produce. When productivity increases, the clove offer will also increase. Quotes increases will affect the increase in export volume of cloves.

US dollar exchange rate variable (X3) has a positive regression coefficient that is equal to 1,976. The positive coefficient values indicate that there is a positive and significant impact on the productivity of cloves to the number of Indonesian clove exports. This illustrates that if there is an increase in productivity by 1 percent, then the number of clove exports will increase by 1,976 percent, assuming other independent variables held constant. Based $t_{count}$ and $t_{table}$, note that the value $t_{count}$ on US dollar exchange rate is equal to 6967 and the significance of 0.000, while the known value of df $t_{tabel}$ is 2:13 to 5%. This indicates that the value does not lie between ± $t_{coun}$ and $t_{table}$ value, and the probability of <0.05, its mean that the variable US dollar exchange rate partially affect the export volume of Indonesian clove. It means that the exchange rate against the dollar plays an important role in international trade. According Trivena, (2013) the exchange rate against the US dollar an important role in international trade, because of the exchange rate against the US dollar allows us to compare prices of all goods and services produced from a variety of countries. Changes of prices will affect the demand for a commodity. Variable exchange rates in accordance with the theory that when the exchange rate of the US dollar against the rupiah has increased the foreign goods will become more expensive and the price becomes cheaper domestic (Mankiew, 2006). Conditions of the increased value of the dollar exchange rate it is very favorable to the exporter of cloves. This is because the exporters would sell cloves abroad at high prices from the rising value of the US dollar against the rupiah exchange rate. With high prices due to the rising value of the US dollar against the rupiah exchange rate, the exporters will increase export volume of cloves. So ups and downs of the value of the US dollar against the rupiah exchange rate affect to the export volume of cloves in Indonesia.

## III. CONCLUSION

Based on the analysis conducted, it can be concluded that the average growth rate of land per year was -0.89%. Clove productivity growth rate of 3.40% annually, while the exchange rate development of the US Dollar against the Rupiah from year 1993-2012 fluktuatively with an average growth amounted to 10.66%. R-square values showed that 77% of the variation of the dependent variable is the export volume of cloves in Indonesia can be explained by the independent variables namely land area

(X1), Productivity (X2), and the US dollar exchange rate (X3). So the factors that affect the export of cloves Indonesia include land use, productivity and the exchange rate of the US dollar.

## REFFERENCES

[1] Ahira A. 2013. Budidaya Tanaman Cengkeh. http://www.anneahira.com/. Diakses 15 Desember 2015
[2] Badan Pusat Statistik. 2013. Statistik Indonesia 2013. Jakarta: Badan Pusat Statik.
[3] Kementrian Pertanian. 2014. Outlook Komoditi Cengkeh 2012. Jakarta: Pusat Data dan Informasi Pertanian.
[4] Departemen Pertanian.Prospek dan Arah Pengembangan Agribisnis Cengkeh. http://www.deptan.go.id. Diakses pada tanggal 12 Oktober 2015.
[5] Direktorat Jendral Perkebunan. 2012.Buku Statistik PerkebunanTahun 2008-2012. Jakarta: Direktorat Jendral Perkebunan Perkebunan.
[6] Food and Agricultural Organisation. http://faostat3.fao.org/. Diakses tanggal 12 November 2015.
[7] GAPPRI. 2005. Data Produksi Rokok Kretek. Jakarta: Gabungan Perserikatan Pabrik Rokok Indonesia.
[8] Mankiew G.2006. Principles of Economics "Pengantar Ekonomi Mikro" Edisi 3. Jakarta: Salemba Empat.
[9] Ruhnayat, A. 2002. Memproduktifkan Cengkeh, Tanaman Tua dan Tanaman Terlantar, Cetakan I.Jakarta: Penerbit Swadaya.
[10] Soekartawi. 2003. Agribisnis dan Teori Aplikasinya. Jakarta: Rajawali Pers.
[11] Suliyanto. 2011. Ekonometrika Terapan: Teori dan Aplikasi dengan SPSS. Yogyakarta: Penerbit Andi

## AUTHOR'S PROFILE

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