

# Effect of Extension Activity and Managerial Ability to Maize Farming Productivity in Malang District of Indonesia

**Teti Sugiarti**

Lecturer, Dept. of Social Economy, Agricultural Faculty, Trunojoyo University, Madura, East Java, Indonesia  
Email: tetibayu28@gmail.com;  
Phone: 081217471321

**Nuhfil Hanani**

Lecturer, Department of Social Economy, Agriculture Faculty, Brawijaya University, Malang, East Java, Indonesia

**Ratya Anindita**

Lecturer, Department of Social Economy, Agriculture Faculty, Brawijaya University, Malang, East Java, Indonesia

**Syafrial**

Lecturer, Department of Social Economy, Agriculture Faculty, Brawijaya University, Malang, East Java, Indonesia

**Abstract** – Based agricultural development strategy aimed at strengthening human resources for increased production, productivity, competitiveness of agriculture and increase farmers' income in Indonesian society. Extension activities aimed at improving the behavior of farmers, which have as an entrepreneur attitude, knowledge, and technical and managerial capabilities. The study aims to analyze the level of farmers' participation in extension activities, the level of managerial ability of farmers, and the impact on the productivity of corn farming. The results of the study are: 1) The level of farmer participation in extension activities is moderate; 2) The level of managerial ability of farmers was moderate; 3) Extension activities directly influence the level of managerial ability of farmers and an indirect effect on the productivity of corn farming. The level of managerial ability of farmers affect the productivity of corn farming. Increased farm productivity, especially corn, made through an increase in managerial ability of farmers, through education and training. In this case the relevant agencies namely the Department of Agriculture and the agricultural extension programs can design and methods of farm management extension with the material, complete the technical aspects.

**Keywords** – Extension, Managerial, Productivity.

## I. INTRODUCTION

The agricultural sector in Indonesia is a strategic economic sector and plays an important role in national development activities. According to data from Data and Information Center (Media Centre) Ministry of Agriculture, in 2011, agricultural labor is the largest labor with national employment reached 38.7 percent. The direct contribution of agricultural sector to the national GDP of 14.7 percent. The gap between the level of employment with its contribution to national GDP by agricultural sector indicates that the level of labor productivity in the agricultural sector is still low which leads to lower welfare of farm businesses. Most farmers still below the average of the welfare of the Indonesian people.

Main problems of agricultural development is a situation where food production growth is lower than the growth of production. In recent years, the rate of productivity growth in Indonesian food is very slow (Lemhanas, 2013). Achievement of technical efficiency of food farming in Indonesia is still relatively moderate to high (0.50 to 0.80), so it is not fully efficient (Saptana, 2012).

As a producer, the farmer acts as farm workers (cultivators), farm leaders (managers) as well as personal self (Hanafie R.2010). The success depends on the quality of the farming activities of farmers. Qualified farmer has entrepreneurship in his managerial ability which is one of the components (A Ghani, 2012). Managerial ability is an essential element of farming (AgustinaS, 2011). Factors that affect the quality of farmers as managers of agricultural activities are age, education, experience, environment, and others (Hanafie, R, 2010).

In regulation of Republic Indonesia no.16 of 2006 on the extension system, agricultural extension is an on-formal education for rural farmers and their families, in order to behave better. Increased managerial ability of farmers is based agricultural development strategy aimed at strengthening human resources for increased production, productivity, agricultural competitiveness and ultimately increasing income of farmers in Indonesian society.

But really how the level of participation of farmers and at what level of managerial ability of our farmers? What is the relationship between extension activities, managerial ability of farmers and farm productivity levels? Chosen as the study of maize because maize as the second most important food source after rice, as well as a trade commodity with the prospect of a business / marketing is pretty good.

Thus the purpose of the study is: 1) to analyzing the level of farmers' participation in extension activities. 2) to analyzing the level of managerial ability of farmers. 3) to analyzing the effect of extension activities and the level of managerial ability of farmers to farm productivity of maize. This research is expected to provide input and an important consideration for farmers, extension workers and related agencies in order to increase farm productivity, especially maize as a staple commodity.

## II. METHODOLOGY

This study is purposive in District Wajak, Malang, East Java, Indonesia, which is the center of corn production. The collection of primary data (cross section) was conducted in May-July, 2013. Primary data collection was done by (1) interviewing and or (2) filling out the questionnaire. Determination of the sampling is done with proportioned stratified random sampling. Based on the formula (Nazir, 2013: p286), then the sample farmers are 85 people.

Most of the questionnaire was designed with a Likert scale and a Guttman scale. Measurement variables were developed and modified from Suparta N (2001), Anantayu S (2009), and Muatit K (2008). While the measurement of managerial capability variables researchers adopt and modify Pandeti (2005), and Ranuji (2006), Rafi (2007).

Questionnaires is a measure of this study first tested for validity and reliability, with test conducted on 20 respondents. The results of testing the validity of the Moment Pears on correlation showed that the correlation coefficient is worth 0.4 to 0.9, meaning that all variables tested is valid. Reliability was analyzed by Cronbach alpha and Spearman Brown, with correlation coefficients ranging from 0.4 to 0.8, meaning that all variables tested are reliable. After correction (editing), conducted scoring or qualification of the respondents' answers. The next step is the summation and tabulation and score the answers of each respondent for each variable were then performed data transformation.

Stages analysis done with the process: 1). Method of calculation of managerial skills By adopting the transformation formulain Soemardjo (1999) in Muatit K(2008), then to transform the value of managerial ability in this study as follows:

Score  $Y_i =$

$$\frac{\text{Total value is achieved} - \text{Total minimum value}}{\text{Total maximum value} - \text{Total minimum value}} \times 100$$

The calculation of the level of managerial ability by using the formula:

$$\text{Level of Managerial Ability} = \frac{\sum \text{Score } Z_i}{3}$$

Further more, for each index variable managerial capabilities are classified into 3 categories, namely low for the index of < 33; 34-66 and are for high/good for > 67. 2). To analyze the relationship between extension activities, managerial ability to farm productivity, the product moment correlation analysis was used. The independent variables were significantly correlated with the dependent variable is then performed multiple regression analysis to test the hypothesis pathway. 3) To determine the influence of which is indicated by the path coefficient on each path diagram of causal relationships between explanatory variables (X1-X9) on the level of managerial ability and its impact on productivity (Z) used analysis path. The amount of influence used or Standarized Beta coefficient values resulting from the regression testing of the variables. Structure equations for analysis as follows:

$$Y = \text{pyx}_1 X_1 + \text{pyx}_2 X_2 + \text{pyx}_3 X_3 + \text{pyx}_4 X_4 + \text{pyx}_5 X_5 + \text{pyx}_6 X_6 + \text{pyx}_7 X_7 + \text{pyx}_8 X_8 + \text{pyx}_9 X_9 + \varepsilon_{1i} \dots(1)$$

$$Z = \text{pzx}_1 X_1 + \text{pzx}_2 X_2 + \text{pzx}_3 X_3 + \text{pzx}_4 X_4 + \text{pzx}_5 X_5 + \text{pzx}_6 X_6 + \text{pzx}_7 X_7 + \text{pzx}_8 X_8 + \text{pzx}_9 X_9 + \varepsilon_{2i} \dots(2)$$

$$Z = \text{pzY} + \varepsilon_{3i} \dots(3)$$

Where :

Y = level of managerial ability

Z = the level of farm productivity

$X_i$  = independent variable to the-I, for  $i=1,2,3,4, \dots n$

$P_{jxi}$  = path coefficients where  $i=1,2,3, \dots n$ ;  $j=Y$  or  $Z$

$\varepsilon_{ji}$  = error term

Hypothesis formulated: 1) extension activities significantly affect the managerial ability of farmers; 2) extension activities significantly affect farm productivity 3) managerial ability significantly affect farm productivity.

### III. RESULT

#### A. Respondents Participation Rate in Extension Activity

Location of the study is the largest corn production center in Malang-Indonesia, the harvest area (7.461 ha) and the largest number of production (538.046 tonnes) and maize productivity is quite high (51.10) which above the average productivity of Malang regency (50,51). In addition to corn, a variety of vegetables also generated a lot of these places include cayenne pepper, shili large, beans and others.

Extension activities in locations such research aims to increase production, productivity and quality of production at the farm level, through increased utilization of the use of bokashi, implementation of land treatment as recommended, the implementation of balanced fertilization, improved farm management and partnership development. Extension methods include demonstration plots, a demonstration of how, meetings, study tours and activities Crop Management Field School and Integrated Resources (SL-PTT) corn.

Table 1: Number of Respondents in Extension Activities

Extension Activities	Frequency	Percent
Meeting/conference	77	90,6
Training	39	45,9
Demonstration	24	28,2
Intern	3	3,53
Filed trip	15	17,6
Exhibition	3	3,53

Source: Adapted from Primary Data, 2013

From Table 1, indicate that the activities of conference / meeting is the most widely followed activity of the respondents, while the internship activities and exhibits at least the level of participation. Respondents who had participated in the activities of conference / meeting reached 91 percent, with the intensity of participation as much as 47.1 per cent (40 people) to "often" and 43.5 per cent (37 people) are still "rare" following the conference / meeting. Thus 9 percent (8) of the respondents had never followed rapat.pertemuan. In other extension activities, respondents who have not completed more activities than ever to follow. Respondent participation in training activities amounted to 46 per cent (39 people), with the intensity of participation as much as 47.1 percent to as much as 12.9 per cent of the intensity of participation (28 people) to "often" and 32.9 per cent (11 people) are still "rare" training. Respondent's participation in the demonstration activities amounted to 29.4 per cent (24 people), but the intensity of the respondent's participation is "rare" in these activities. Next, internship activities and exhibits only a small fraction (3 people) who follow the activities of the intensity of the "rare".

In general, based on the level of awareness and the level of intensity of the respondents participated in various extension activities can be seen in Table 2. The level of participation in the activities of respondents conference/meeting are in the high category. This means that the respondents, on consciousness, often following meetings/conferences. In one calendar year, the average activities of conference/meeting conducted 3-4 times, mainly to discuss preparations for planting.

Table 2: Level of Respondents Participation in Extension Activities

Extension Activities	The Average Index	Category
Meeting/conference	70,00	High
Training	58,82	Moderate
Demonstration	31,38	Low
Intern	3,53	Low
Filed trip	17,65	Low
Exhibition	3,53	Low
Participation of farmers in extension activities	34,08	Moderate

Source: Adapted from Primary Data, 2013

Specification: >67=high ; 34-67=Moderate; <34 =Low

Further more, respondent's participation in training activities in the moderate category. This is due to the training has not been evenly distributed across all study sites. While the respondent's participation in the demonstration activities and field visits, the exhibition is still in the low category.

### B. Managerial Ability level Farmers

As a manager of agricultural activities, farmers' managerial ability is important. Managerial capabilities include the ability of farmers in decision-making, planning and coordinating farm farming activities. In general, the level of managerial ability respondent is moderate, with the distribution of respondents on this level as much as 58.82 percent (50 people). Respondents who have a high level of managerial ability as much as 32.94 percent (28 people), while still low as 8.24 percent (7 people).

Table 3: Managerial Ability level of Respondents

Managerial Ability	The Average Index	Category
Farm planning	67,84	High
Decision-making	49,22	Moderate
Coordinating activities of farming	60,71	Moderate
Managerial ability level of farmers	59,85	Moderate

Source: Adapted from Primary Data, 2013

Specification: >67=high ; 34-67=Moderate ; <34 =Low

### Farm Planningability.

Farm planning is important to recognize the risks of farming that occurs later in life. Farm planning is a strategic steps to achieve the goal or goals that are set/desired by farmers. Farmers who have skills in farm planning calendar will first develop farming activities, advance estimates of seed, fertilizer and other production facilities, first estimate the amount of capital required for

farming activities, consult with experts in order to successfully deal with farming activities, and will anticipate in advance the possibility of failure. In general, respondents have the capability of Farm Planning at a high level (67.53), with the distribution of respondents at this level to 46 percent.

### Farming Decision Making Ability

Farmers should have the ability to farm decision making so that decisions taken are appropriate and quick. In general, respondents in the decision-making ability of farming is at a medium level with the distribution of respondents in this category at 60 percent.

Table 4: Decision Making Ability level farming

Decision	Level of Index	Category
Filed site	54,07	Moderate
A wide varieties	62,79	Moderate
The amount of fertilizer	51,74	Moderate
The amount of pesticide	58,14	Moderate
Time sale	69,77	High
Written record	4,07	Low

Source: Adapted from Primary Data, 2013

Specification: >67=high ; 34-67=Moderate; <34 =Low

In terms of deciding the type of varieties of corn, then the decision to seed corn variety selection based on the recommendation of the partnership. The decision on the location of the research partnership is the result of a collective decision Gapokt an level consultation was attended by all members of the groups, but every farmer has the right to participate or not participate in the partnership. Right now, several partners have offered cooperation partnerships, and most farmers choose partners bring many advantages (relatively easy maintenance and high prices). However, for the selection of maize variety is the consumption of most respondents choosing corn varieties because of the habit. Since long they use the same corn variety as that is easily available and at a cheap price. Respondents buy from neighbors or from the crop itself, Decision-making in terms of the amount of fertilizer and the amount of pesticide used, many farmers still rely on instinct and habit. Often still ignore the recommendation of extension officers or partners.

### Coordinate the ability of farming activities

Farmers have to harmonize and synchronize various agricultural activities in order to complete the work with instipulated time period. Farmers who have the ability to coordinate all farming activities will prepare the means of production long before needed or will be used. Such as fertilizer, to avoid shortages of fertilizer, the farmers much earlier had bought and prepared. Similarly, the seed needs to get it much earlier had or knew for sure going to get it so it is ready when needed. Farmers also should make prior estimates (much earlier) how much capital/money needed for farming corn planting plan and perform well. And when heard no pests or diseases in other areas then immediately coordinate with the instructor/officer to avoid attack coming on farming land. In general, the ability of respondents to coordinate farming activities are at a medium level (60.71), with the distribution of respondents at this level reached 42 percent.

*C. Effect of Extension Activities. Managerial Ability on Productivity of Maize Farming*  
*Effect of Extension Activities on Managerial Ability*

Based on product moment correlation analysis, in Table 5, it appears that the variable participation in extension activities, formal education, family income, land tenure, access to resources, participation in farmer groups and the availability of facilities and infrastructure farming significantly correlated with the level of managerial ability on 90 percent confidence level.

Table 5: Correlation Coefficients, Variables Associated with Managerial Ability

Variable	Correlation Coefficient
Age (X1)	0,056
Formal education (X2)**	0,235
Farming experience (X3)	0,034
Family income (X4)***	0,354
Land tenure (X5)***	0,390
Access to information (X6)***	0,584
Extension activities (X7)***	0,679
Farmer group activities (X8)***	0,463
Facilities & infrastructure (X9)***	0,325

Description: \*\*\*highly significant at the 0.05 level  
 \*\*highly significant at the 0,1 level

Further variables were significantly correlated with managerial ability of farmers analyzed by multiple regression to test the hypothesis pathway. Based on the obtained F for the ANOVA table for 12,597 with a probability index (sig)=0.000. Because the index sig<0.05, then the decision is H0 is rejected and Ha accepted means of all the explanatory variables jointly affect the managerial ability. Determinant coefficient  $R_{\text{square}}$  or  $R^2_{Z_{x1-x13}} = 0.534$  or 53.4 percent, and the magnitude of the other variables equal to  $(1-.534) = 0, 464$ , or 46.4 percent.

Table 6: Path Coefficient, Effect of Exogenous Variables on Managerial Ability

Variables Influence	Path Coefficient (Beta)	T Ratio	Sig
Formal education (X2)	0,104	1,224	0,225
Family income (X4)	-0,117	-0,863	0,396
Land tenure (X5)	0,137	1,002	0,320
Access to information (X6)**	0,185	1,687	0,096
Extension activities (X7)****	0,432	3,571	0,001
Farmer group activities (X8)	0,094	2,012	0,351
Facilities & infrastructure (X9)***	0,163	0,939	0,048
F value	12,597		0,000
Determinant coefficient (R Square)		0,534	

Description: \*\*\*\*highly significant at the 0.01 significance level  
 \*\*\*highly significant at the 0.05 level  
 \*\*highly significant at the 0,1 level

Individually testing showed that access to information, extension activities, and the availability of facilities and infrastructure, each affect the managerial ability of farmers. Probability index (sig) for each variable is smaller than 0.1, so that Ha is accepted, which means that each variable access to information, extension activities and the

availability of facilities and infrastructure, significant effect. Path coefficient is positive, indicating the higher these variables then farmers will have a better managerial capabilities.

Furthermore, the structure of the equation is written as follows:

$$Z = 0,185 X_6 + 0,432 X_7 + 0,163 X_9$$

*Effect of Extension Activities on Productivity of Maize Farming*

Based on product moment correlation analysis, in Table 7, it appears that the variables are significantly correlated with farm productivity is education, family income, land tenure, extension activities, farmer group activities, facilities and infrastructure, as well as managerial activity.

Table 7: Correlation Coefficients, Variables Associated with Corn Farm Productivity

Variable	Correlation Coefficient
Age (X1)	-0,044
Formal education (X2)***	0,232
Farming Experience (X3)	-0,059
Family income (X4)****	0,381
Land tenure (X5)	0,320
Access to information (X6)	0,207
Extension activities (X7)****	0,348
Farmer group activities (X8)**	0,370
Facilities & infrastructure (X9)***	0,269
Managerial ability (Y)****	0,323

Description: \*\*\*\*highly significant at the 0.01 significance level  
 \*\*\*highly significant at the 0.05 level  
 \*\*highly significant at the 0,1 level

Further more, to look at the factors that affect the productivity of corn farming is carried out by multiple regression analysis to test the hypothesis pathway. After testing occurred multi kolinear and to produce the best model of the tenure variables were excluded from the model. The test results as shown in Table 8.

Table 8: Path Coefficient, Effect of Exogenous Variables on Productivity of Maize Farming.

Variables Influence	Path Coefficient (Beta)	T Ratio	Sig
Formal Education (X2)	0,146	1,456	0,149
Family Income (X4)**	0,206	1,775	0,080
Extension Activities (X7)	0,086	0,688	0,493
Farmer Group Activities (X8)	0,177	1,417	0,161
Facilities and Infrastructure (X9)**	0,173	1,732	0,087
F value	5,387		0,000
Determinant coefficient (R Square)		0,254	

Description: \*\*highly significant at 0.1 significance level

Based on the obtained F for the ANOVA table for 5,387 with a probability index (sig)=0.000. Because the index sig<0.05, then the decision is H0 is rejected and Ha accepted means of all the explanatory variables jointly affect the farming corn productivity. The magnitude of the coefficient of determination  $R_{\text{square}}$  or  $R^2_{Z_{x1-x13}} = 0.254$  or 25.4 percent, and the magnitude of the other variables equal to  $(1-.254) = 0, 746$ , or 74.6 percent.

Individually testing showed that the only variable family income levels and the availability of facilities and infrastructure have a significant effect on the level of productivity of corn farming, with a probability index (sig) is smaller than 0.1. Path coefficients are positive, indicating higher levels of family income, availability of farm infrastructure, the level of productivity of corn farming becomes higher.

Furthermore, the structure of the equation is written as follows:

$$Y = 0,229 X_4 + 0,177 X_9$$

**Effect of Managerial Ability on Productivity of Maize Farming**

Furthermore, correlation and regression analysis to examine the relationship between variables and the effect of managerial ability to farm productivity. Based on product moment correlation analysis, the managerial ability of farmers significantly associated with farm productivity. Correlation coefficient is 0.323 and significant at the 99 percent confidence level. After testing the regression variables significantly affect managerial ability of farmers to farm productivity 95 percent confidence level.

Based on regression analysis, the coefficient of determination  $R_{\text{square}}$  or  $R^2_{Z_{x1-x13}} = 0,049$  or 4,9 percent, and the magnitude of the other variables equal to (1-0.04) = 0,906, or 90.6 percent.

Table 9: Path Coefficient, Effect of Managerial Ability Variables on Productivity of Maize Farming.

Variables Influence	Path Coefficient (Beta)	T Ratio	Sig
Managerial ability***	0,323	2,314	0,003
F value	9,696		0,003
Determinan coefficient (R Square)		0,094	

Description: \*\*\*highly significant at 0.05 significance level

Conceptually, the direction and magnitude of the influence of these variables on productivity visualized in Figure 1. Extension activities are not directly affected by the managerial ability to farm productivity. Availability of facilities and infrastructure directly and indirectly affected by the managerial ability to farm productivity. Furthermore, the direct effect of family income on farm productivity and farmers' access to resources through indirect influence on the productivity of farm managerial ability.

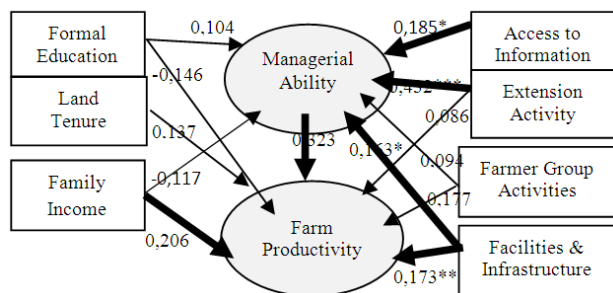


Fig.1. Effect of Variables Between Maize Farming against Technical Efficiency

**IV. CONCLUSION**

- 1) The level of farmer participation in extension activities is moderate, with the distribution of respondents on the level of 42 percent. Only the activities of the meeting / meetings that have a high participation rate.
- 2) The level of managerial ability of farmers was moderate, with the distribution of respondents on this level as much as 54 percent. But the ability of respondents in farm planning has been at a high level.
- 3) Extension activities directly influence the level of managerial ability of farmers and an indirect effect on the productivity of corn farming. The level of managerial ability of farmers affect the productivity of corn farming

**REFERENCES**

- [1] Agustina Shinta. Science Farming. Malang: UB Press, 2011, pp.35-59
- [2] Anantayu, Saptana. Farmer Participation in Enhancing Institutional Capacity of Farmers Group (Case in Central Java Province) : Dissertation, Graduate School. IPB. Bogor, 2004. (Online). Available: <http://repository.ipb.ac.id/handle/123456789/346>
- [3] Gani, Andi. Understand Entrepreneurship, UB Press. 2014, pp:3-26
- [4] Lemhanas. Increase Productivity To Achieve Food Security in the Context of Food Security. Journal (Online) Defense Studies RI. May 15 2013 edition of Economic Studies Directorate. Lemhanas. Jakarta, 2013. Available : [http://www.lemhanas.go.id/portal/images/stories/umas/jurnal/edisi15/jurnal%20edisi%2015\\_materi%202.pdf](http://www.lemhanas.go.id/portal/images/stories/umas/jurnal/edisi15/jurnal%20edisi%2015_materi%202.pdf)
- [5] Hanafie, Rita. Introduction to Agricultural Economics. Publisher Andi Yogyakarta, 2010, pp : 71-94
- [6] Muatuf, Krisniwati. 2010. Entrepreneurship Competencies 2008 Dairy Cattle Breeders. The case of the People in Dairy Cattle Breeders Pasuruan East Java and West Java Bandung regency. Dissertation. Graduate School, IPB. Bogor. Available: <http://repository.ipb.ac.id/>
- [7] Nazir M. Research Methods. Publisher Ghalia Indonesia, 2003, pp:271-326
- [8] Pandeti, A Study on Entrepreneurial Behavior of Farmers in Raichur District Of Karnataka. Thesis (online) Submitted to the University of Agricultural Sciences, Dharwad. 2005. Available : <http://www.uasd.edu/library-files/theses/AEX.pdf>
- [9] Data and Information Center of Agriculture. Agricultural Sector Employment Statistics 2013, Year 2013, the Secretariat General of the Ministry of Agriculture, Jakarta. 2013, Available : <http://pusdatin.setjen.pertanian.go.id/>
- [10] Statistics Macro Agriculture Sector In 2013 the Secretariat General of the Ministry of Agriculture, Jakarta, 2013. Available : <http://pusdatin.setjen.pertanian.go.id/>
- [11] Agricultural Statistics Human Resources and Institutional Farmers In 2013 Sekretariat General of the Department of Agriculture. Jakarta, 2013, Available : <http://pusdatin.setjen.pertanian.go.id/>
- [12] Ranuji. A Study on the Behaviour of Dairy. Thesis entrepreneurial. Submitted to the University of Agricultural Sciences, Dharwad, 2006. Available: <http://www.uasd.edu/library-files/theses/AEX.pdf>
- [13] Rafi. A Study on Entrepreneurial Behavioural Characteristic of SC and ST Farmer of Gulbarga District. Submitted to the University of Agricultural Sciences, Dharwad, 2007. Available: <http://www.uasd.edu/library-files/theses/AEX.pdf>
- [14] Saptana. Food and Farming Efficiency Concept Implications for Productivity Improvement. Journal (Online) Agro Economic Research Forum Volume 30 :2 December 2012: 109: 126. Economic and Social Center of Agricultural Policy. Bogor. 2012. Available : <http://pse.litbang.deptan.go.id/ind/pdf/FAE30-2c.pdf>
- [15] Suparta N. 2001 Behavior Agribusiness and Extension Needs Broiler Breeders. Dissertation. Graduate School. IPB. Bogor, 2001, Available : <http://repository.ipb.ac.id/>