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The Role of Agricultural Instructors on Coffee Farmers' Technical Capabilities

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Keywords:	**Abstract**
technical ability; the role of extension instructors; coffee plants	Improving farmers' skills is one of the objections of extension program. Agricultural instructors through extension programs help farmers in the implementation of agricultural commodities according to the procedure. The aim of this study was to determine the technical capabilities of coffee farmers, the role of agricultural extension instructors as motivators, educators, facilitators, communicators and dynamists as well as the influence of the role of agricultural extension instructors on the technical abilities of coffee farmers. The quantitative descriptive method was used in this study. The object of research was the "Tani Harapan" Farmer Group in Amadanom Village, Dampit District, Malang Regency. Census was held for the determination of respondents. Primary data were collected by means of observation, interviews, and questionnaires. Analysis of the data used was Multiple Linear Regression. The results of the study explained that the role of agricultural extension was included in the category often done with a percentage of 39.40% and the technical abilities of farmers included in the category of very capable with a percentage of 88.48%. The role as educator and facilitator has a positive effect while the motivator, communicator and dynamicator does not affect the technical ability of coffee farmers. The successful implementation of the instructor's role experienced obstacles caused by age factors. The age of the members of the farmer group is not productive, and therefore often has difficulty in understanding the material and practices provided by the instructors.

INTRODUCTION

The role of agricultural extension instructors becomes very important in terms of disseminating information and technology and providing solutions to problems faced by farmers. Agricultural extension instructors bring changes in the technical ability of farmers to cultivate. One of the agricultural commodities in the plantation sector that requires farming skills in obtaining quality harvests is coffee. One of the biggest coffee production in Malang Regency is in Dampit District with total production reached 2,387 tons in 2017 (Central bureau of Statistics, 2017). Amadanom Village is one of the villages in Dampit district that has several farmer groups, one of which is the "Tani Harapan" Group. This group is successful in coffee cultivation as evidenced by having been granted Indonesia's National Standard (SNI) certified organic coffee.

There were some previous researches found on the role of agricultural instructors. Makmur (2018) analyzed the role of agricultural extension in improving the competence of the farmer. The results showed that the role of agricultural instructors as facilitators, motivators, educators, and communicators influenced the competence of farmers. Astuti (2015) examined the role of the field extension in increasing agricultural productivity with the result that explains that the role of FEA as counselors, evaluators, observers, and technicians effect on increasing agricultural productivity. Yunasaf (2012) discussed the role of instructors in the learning process of dairy farmers, with the results of the study showing that they are classified as having an adequate role as educators and facilitators.

The farming technical ability of "Tani Harapan" Group members can be categorized as sufficient because before they got the extension programs from agricultural extension instructors, the coffee yields had not reached good quantity and quality. The role of agricultural extension instructors makes this group have an excellent coffee yields with national standard.

This background was used as a reference for this research on the role of agricultural extension instructors. The aims of this study was to 1) determine the role of agricultural extension instructors as motivators, educators, facilitators, communicators, dynamists, and technical abilities of coffee farmers, 2) the influence of the role of agricultural extension instructors on farming technical ability in "Tani Harapan" Group in Amadanom Village, Dampit District, Malang Regency.

RESEARCH METHODS

The type of this research is quantitative descriptive with primary data sources obtained through questionnaires containing questions and the results of interviews and observations made in the field. The research location is in Amadanom Village, Dampit District, Malang Regency with the object of research was the "Tani Harapan" group. The "Tani Harapan" group was established in 2001 which continues to this day. This farmer group has six business units that have run smoothly, although there were several obstacles, they can be overcome by all members. The business

units are savings and loan, goat livestock, production facilities, land rentals, coffee processing and educational coffee ecotourism. The location was intentionally selected (purposive), with the consideration that Dampit is one of the districts in Malang which produced highest number of coffee, that was 2,387 tons in 2017 (Central Bureau of Statistics, 2018) and the group "Tani Harapan" is capable of producing organic coffee with National standards.

The study was conducted in November-December 2019. The sampling technique used was a census with 25 group members of farmer group who became objects of research. Census is the technique of determining the research sample by turning the entire population into a sample (Sugiyono, 2012).

Data collection was done by measuring objects from research variables by instrument testing (Yusup, 2018). Test validity and reliability are two ways to test data instruments. The classic assumption test was carried out by tests of linearity, normality, multicollinearity and heteroscedasticity. The analytical method used to determine whether the role of agricultural instructors affects the technical ability of coffee farmers is the coefficient of determination, F-test, t-test and multiple linear regression analysis.

The multiple linear regression model is an equation that illustrates the effect of two or more independent variables / predictors (X1, X2, ... Xn) on one independent variable / response (Y) (Yuliara, 2016). The equation in this study was as follows:

$$Y = a + b1X1 + b2X2 + b3X3 + b4X4 + b5X5 + e$$

Y   = technical ability
A   = constant
B   = regression coefficient
X   = independent variable (motivator, educator, facilitator, communicator, dynamicator
e   = error

The way to get the results of interpretation is to know the highest and lowest score. The formula used was as follows (Sudjana, 2000):

$$\text{Length of Class Intervals} = \frac{Range}{Interval\ class\ number}$$

This study concluded the range of scales used in determining the role of agricultural extension instructors and the technical abilities of coffee farmers as follows:

Range   = Lowest Value – highest value
Number of class interval   = 5
Highest Value   = The number of indicators for each independent variable
                                       x Highest Score
                                  = 6 x 5
                                  = 30
Lowest Value   = The number of indicators for each independent variable
                                       x Lowest score
                                  = 6 x 1
                                  = 6
Length of Interval Class   = $\frac{30-6}{5}$ $\frac{30-6}{5}$

$$= 4,8$$

The criteria for the role of agricultural extension variables were further determined:
Value 6.0 - 10.8   = Never Done
Value 10.9 - 15.7   = Rarely Done
Value 15.8 - 20.6   = Sometimes Done
Value of 20.7 - 25.5 = Frequently Done
Value 25.6 - 30.0   = Always Done.

Interval class calculation for the variable technical ability of farmers was as follows:

Highest Value = Number of indicators for each dependent variable x highest score

$$= 15 \times 5$$
$$= 75$$

Lowest Value = Number of indicators for each dependent variable x lowest score

$$= 15 \times 1$$
$$= 15$$

Length of Class Intervals $= \dfrac{75-15}{5}$
$$= 12$$

Next, the criteria were determined:
Value 15.0 - 27.0 = Very Unable
Value 27.1 - 39.1 = Unable
Value 39.2 - 51.2 = Poor
Value 51.3 - 63.3 = Capable
Value 63.4 - 75.0 = Very capable   .

RESULT AND DISCUSSION

The Role of Agricultural Instructors and Farming Technical Ability

The role of agricultural instructor was investigated as a motivator, educator, facilitator, communicator and dynamicator. Technical ability or farming skills must always be improved to obtain maximum yields both in terms of quantity and quality. Following is a table which shows the breakdown of agricultural extension instructors' roles and technical abilities of the farmers.

Table 1. The Role of Agricultural Extension Instructors and Farmers' Technical Capabilities

No	Indicator	Maximum Score	Actual Conditions	Percentage (%)	Category
1	Motivator	30	23.72	79.06	Often done
2	Educator	30	21.80	72.66	Often done
3	Facilitator	30	22.92	76.40	Often done
4	Communicator	30	25.04	83.48	Often done
5	Dynamist	30	24.72	82.40	Often done
	The Role of Agricultural	300	23.64	39.40	Often done

Extension Instructors				
Technical Ability	75	66.36	88.48	Very capable

Source : Processed from primary data (2020)

Table 1 explains that the five roles of agricultural instructors are in the "often done" category, meaning that agricultural extension instructors often provide materials related to coffee cultivation with an average percentage of 39.40%. The technical ability of farming gets a value of 88.48% of the maximum score listed. This percentage shows that the technical abilities of farmers in "Tani Harapan" Group are "very capable".

These results are in line with Riana (2015) with the conclusion that self-help agriculture extension agents in the cocoa cultivation process play a significant role. As well as the research from Astuti (2015) that stated agricultural extension was very important to increase agricultural productivity. Yunasaf (2012) summarized that the instructors played quite a role as an educator and facilitator for farmers. Makmur (2018) showed that the role of agricultural extension was very important for farmers and the skills of rice farmers were categorized as 'good'.

The Influence of the Agricultural Extension Instructors on Coffee Farmers' Technical Capabilities

The F-test was used to find out the significant influence of the independent variables on the dependent variables. t-test was used to determine whether the independent variable has partially significant effect on the dependent variable (Yuliara, 2016). Following are the results of the two hypothesis tests.

Table 2 . Hypothesis Results

Variable	t_{hit}	t_{tab}	Exp	F_{hit}	F_{tab}	Exp
Motivator	1,563	2,093	No effect			
Educator	2,261	2,093	Take effect			
Facilitator	3,036	2,093	Take effect	6,048	2,710	Take effect
Communicator	1,711	2,093	No effect			
Dynamist	- 4,239	2,093	No effect			

Source: Processed from primary data (2020)

Table 2 shows the F_{hit} value of 6.048. This means that $F_{hit} > F_{tab}$, and with this condition the H0 is rejected, meaning the five roles of agricultural extension workers influence the technical abilities of coffee farmers together. Based on the results of research the role of instructors is a driver in farming carried out by farmers. The results of the F-test are in line with Makmur (2018) which had the conclusion that the role of extension workers as facilitators, motivators, educators and communicators influences the skills of farmers in the Rea Village Farmer Group.

The table above also shows the results of the t-test which showed the t_{hit} value of the motivator was 1,563 <2,093 (H0 accepted), educator 2,261> 2,093 (H0 rejected), facilitator 3,036> 2,093 (H0 rejected), communicator 1,711 <2,093 (H0 accepted) and the dynamicator -4,239 <2,093 (H0 received). Based on the value of the t-test it can be concluded that the role as educator and facilitator influences the

technical ability of farmers while the motivator, communicator and dynamicator have no effect. Based on the results of interviews with respondents, the role of agricultural extension has been carried out well; however, farmers assume that it is useless if others provide motivation but in themselves have not been motivated to do something exemplified by others.

These results are in line with Makmur (2018) which stated that the role of agricultural instructors as facilitators, motivators, educators and communicators simultaneously influences the skills of farmers in the Rea Village Farmer Group. These results are also in line with Hapsari (2018) which stated that the role of agricultural extension workers had been influenced the skills of rice farmers in the Sidomakmur I Farmer Group in Dengkek Village, Pati District, Pati Regency. However, the results of this study are not in line with (Marbun, 2019b) that stated the role of agricultural extension workers as motivators, communicators, facilitators, and initiators have no effect on the development of farmer groups.

Magnitude analysis of the influence of the agricultural extension instructors on coffee farmers' technical capabilities was using multiple linear receipts. The results of the test can be seen in the table below.

Table 3 . Multiple Linear Regression Test Results

No	Information	B	Sig. (2 tailed)
1	Motivator (X_1)	.641	.135
2	Educator (X_2)	0.933	0.036
3	Facilitator (X_3)	1,411	0.007
4	Communicator (X_4)	0.913	.103
5	Dynamic (X_5)	-2,439	0,000
6	Technical Ability (Y)	35,892	0.077

Source : Processed from primary data (2020)

Table 3 shows the multiple linear regression equation is Y = 35.892 + 0,641X_1 + 0,933X_2 + 1,411X_3 + 0,913X_4 - 2,439X_5 + e. A constant of 35.889 means that if the motivator (X_1), educator (X_2), facilitator (X_3), communicator (X_4) and dynamic (X_5) value are 0, then the technical ability (Y) value is 35.889. Regression coefficient X1 0.641 means that if the motivator has increased by one value, the technical ability will increase by 0.641 assuming the value of the other independent variables remains. The regression coefficient X2 0.933 means that if the educator has increased by one value, the technical ability will increase by 0.933 assuming the value of the other independent variables is fixed. Regression coefficient X3 1.411 means that if the facilitator has increased by one value, the technical ability will increase by 1,411 assuming the value of the free variable is fixed. Regression coefficient X4 0.913 means that if the communicator rises by one value it will increase technical ability by 0.913 assuming the value of the other independent variables is fixed. Regression coefficient X5 -2.439 means that if the dynamics increases by one value, it will decrease technical ability by 2,439 assuming the value of the free variable remains.

These results contradict the research of Marbun (2019) with a regression equation Y = -106,135 + 16,833 X1 + 0.838 X2 + 92,228 X3 + 24,938 X4. The value of the constant negative value (-106,135) indicated that if the independent variable has increased, the development of horticultural crop farmer groups does not tend to

increase. The results of the constant of this study are contrary to the study of Makmur (2018) in which the regression equation obtained was Y = -2,179 + 0.466 X1 + 0.383 X2 + 0.623 X3 + 0.527 X4. The positive constant values above are in line with Shofiyah et al, 2019, which examined the influence of the role of agricultural instructors on socioeconomic conditions by obtaining a regression equation Y = 1.64 + 0.35 X1 + 0.13 X2 + 0.05 X3 + e means there was a positive influence on the role of the instructor on the socio-economic conditions of farmers.

CONCLUSION

Based on research that had been carried out in the "Tani Harapan" Group, it is concluded that the role of agricultural instructors as motivators, educators, facilitators, communicators and dynamists is often done with a percentage of 39.40%. The technical skills of farming coffee farmers in the "Tani Harapan" Group are very capable, with a percentage of 88.48%. The role of agricultural extension instructors has a simultaneously significant effect on the technical abilities of farmers. The positive constants resulting from the regression test indicate that there is a positive influence between the factors of the role of agricultural instructors on the technical abilities of farmers

RECOMMENDATION

Agricultural extension instructors need to approach the members of farmer groups more frequently in order to get the attention of the farmers in the delivery of extension materials. Furthermore, they can digest the materials to be applied in coffee cultivation. The group leader who is also authorized as a self-help counselor needs to conduct in-depth guidance to members, so that the material provided by the extension instructors can be accepted and applied according to the procedure. Farmer groups need to do regeneration considering the ages of dominant members are not productive anymore. It aims to renew members with the ones in productive ages in order to increase and improve the quality of yields. The technical abilities of cultivation from each farmer are different and will change with the counseling. Further researchers should examine more about the role of agricultural extension instructors and prove that role of agricultural extension workers is really needed by farmers.

REFERENCES

Astuti, I. W. (2015). Peran Penyuluh Pertanian Lapangan (PPL) Dalam Peningkatan Produktivitas Pertanian Di Desa Batu Timbau Kecamatan Batu Ampar Kabupaten Kutai Timur. Jurnal Ilmu Pemerintahan, 3(1), pp. 433–442. Available at: https://adoc.tips/download/peran-penyuluh-pertanian-lapangan-ppl-dalam-peningkatan-prod.html?reader=1.

Central Bureau of Statistics. (2017). Kabupaten Malang Dalam Angka 2017. Available at: https://malangkab.bps.go.id/publication/2017/08/08/6533ec882630b114e56ece04/kabupaten-malang-dalam-angka-2017.html.

Central Bureau of Statistics. (2018), Produksi Kopi Kecamatan Dampit. Available at: https://malangkab.bps.go.id/statictable/2016/09/06/552/luas-dan-produksi-kopi-robusta-rakyat-menurut-kecamatan-di-kabupaten-malang-

2016-2018.html.

Hapsari, P. W. (2018). Peran Penyuluh Pertanian Terhadap Keterampilan Petani Padi Di Kelompok Tani Sidomakmur I Di Desa Dengkek Kecamatan Pati Kabupaten Pati. pp. 84–119.

Makmur. (2018). Peran Penyuluh Pertanian Terhadap Peningkatan Kompetensi Petani Dalam Aktivitas Kelompok Tani Di Desa Rea Kecamatan Binuang Kabupaten Polewali

Mandar. Jurnal Agrisef. Available at: http://eprints.unm.ac.id/13003/1/IV JURNAL MAKMUR.pdf.

Marbun, D. N. V. . (2019). Peran Penyuluh Pertanian Dalam Pengembangan Kelompok Tani Tanaman Hortikultura di Kecamatan Siborongborong, Kabupaten Tapanuli', Jurnal Ekonomi Pertanian dan Agribisnis (JEPA), 3, pp. 537–546. Available at: https://jepa.ub.ac.id/index.php/jepa/article/download/228/121.

Riana, A. (2015). Peranan Penyuluh Swadaya Dalam Mendukung Intensifikasi Kakao Di Kabupaten Sigi Provinsi Sulawesi Tengah. Jurnal Penyuluhan, 11(2), pp. 201–211. Available at: http://journal.ipb.ac.id/index.php/jupe/article/download/10583/8197.

Shofiyah dkk. (2019). Pengaruh Peran Penyuluh Pertanian Terhadap Kondisi Sosial Ekonomi Pertani Di Kelompok Tani "Ngawi" Desa Kumpai Batu Atas Kecamatan Arut Selatan Kabupaten Kotawaringin Barat. Jurnal AGRIFOR, XVIII.

Sudjana. (2000). Metode Statistika. Bandung: Tarsito.

Sugiyono. (2012). Metode Penelitian Kuantitatif Kualitatif dan R&D. Bandung: Alfabeta.

Yuliara, I. M. (2016). Regresi linier berganda. Universita. Bali: Fakultas Matematika Dan Ilmu Pengetahuan Alam. Available at: https://simdos.unud.ac.id/uploads/file_pendidikan_1_dir/5f0221d2b0bb7ced1d61798fab7f4ad3.pdf.

Yunasaf, U. (2012). Peran Penyuluh dalam Proses Pembelajaran Peternak Sapi Perah di KSU Tandangsari Sumedang. Jurnal Ilmu Ternak, 12(1),pp.41–46.