The Role of Field Agricultural Extensive in Empowerment o5f Coffee Farmers (Case Study of Coffee Farmers Group in Trawas District, Mojokerto Regency)

Ony Darmawan[1], Mubarokah[2], Sri Tjondro Winarno[3]*

[1]*Master of Agribusiness Study Program, Indonesia*
[2]*Faculty of Agriculture, UPN Veterans East Java, Indonesia*
[3]*Jl. Rungkut Madya No. 1 Gunung Anyar, Gunung Anyar District, Surabaya East Java City, Indonesia*
**Corresponding Author*

Abstract*: The shortage of government extension workers in the field has led to a gap in farmers' innovation towards rapid changes in information and a decrease in the effectiveness of extension activities. As a result, farmers are powerless in dealing with changes in their own environment, especially with regard to farming, so that the role of extension workers is still needed by farmers to overcome this. This study aims to describe the role of agricultural extension workers and the empowerment of coffee farmers and to analyze the effect of the role of agricultural extension workers on the empowerment of coffee farmers in Trawas District, Mojokerto Regency. The sampling technique used proportional random sampling, meaning that each farmer group was represented by each respondent with a proportional amount. Each farmer group was taken as many as 6, after being multiplied by the number of farmer groups, the sample in this study amounted to 66. The analysis in this study used descriptive analysis and Structural Equation Modeling (SEM-PLS) analysis. The results of the study that the role of agricultural extension agents as innovators have a significant positive effect on the empowerment of coffee farmers in Trawas District, Mojokerto Regency. As an innovator, extension workers provide the latest ideas or ideas about coffee cultivation, extension workers also provide the latest breakthroughs on harvest and post-harvest handling. The role of agricultural extension workers as motivators has a significant positive effect on farmer empowerment. The role of agricultural instructors as facilitators has a significant positive effect on the empowerment of coffee farmers in Trawas District, Mojokerto Regency. The role of agricultural instructors as communicators has a significant positive effect on the dependent variable of Farmer Empowerment. The role of the extension agent is to act as a communicator by delivering extension materials and communicating well, the extension worker also listens to complaints from members of the farmer group during extension activities.

***Keywords*: Empowerment of farmers, Agricultural Extension, Coffee**

I. PRELIMINARY

The plantation sub-sector contributes significantly to the Indonesian economy and is a provider of raw materials for the industrial sector, an absorber of labor and a foreign exchange earner (Directorate General of Plantations, 2020). One of the leading commodities in the plantation sub-sector is coffee. Coffee (Coffea sp) is a product that has good market opportunities both domestically and abroad. Indonesia is one of the largest coffee producers in the world. The opportunity to develop coffee as a driving force for the regional economy is actually very large, especially for coffee production centers.

The process of successful production activities in the majority of farmers' farming has problems regarding the lack of information on prices, capital, technology, social and political aspects related to policies for farmers. Therefore, agricultural extension activities are needed to overcome these problems and encourage farmers to be able to develop their businesses in various activities related to the agricultural sector (Halimah & Subari, 2020).

Agricultural extension in the sense of community empowerment implies that farmers are people who are able to develop their potential according to the potential of natural resources around them. With this potential, farmers are expected to be able to change their mindset for the better. This means that agricultural extension can be regarded as a form of education for farmers and their families. The principle of education for farmers is carried out through adult education that prioritizes humanization, democracy, and empowerment. The principle of adult education implies that extension and farmers are the first and last elements in carrying out agricultural development (extension first and extension last, farmers first and farmers last).

Agricultural extension is non-formal education for farmers to gain expertise, knowledge and skills through a learning process initiated by extension workers. An extension worker influences the target through his role as a motivator, facilitator, communicator, and farmer innovator (Marbun, et al., 2019). In the process of extension activities, it is necessary to have a role for farmer groups because farmer groups are one of the components of the agribusiness system. Although extension workers work with farmers or farmer groups to

carry out development in the agricultural sector, government policies that are in favor of extension workers are still needed.

Cooperation between extension workers and farmer groups is needed to produce good and quality farmers. Therefore, extension workers act as motivators, communicators, facilitators and innovators, namely conducting farmer group development so that later the group will be able to grow and develop into an adequate economic power and will then be able to support the welfare of its members (Najib & Rahwita, 2010) . The current shortage of extension workers causes a gap in assisting farmers in rural areas (Haryanto et al., 2018). The shortage of government extension workers in the field has led to a gap in farmers' innovation towards rapid changes in information and a decrease in the effectiveness of extension activities. As a result, farmers are powerless in dealing with changes in their own environment, especially with regard to farming, so that the role of extension workers is still needed by farmers to overcome this. This study aims to describe the role of agricultural extension workers and the empowerment of coffee farmers and to analyze the effect of the role of agricultural extension workers on the empowerment of coffee farmers in Trawas District, Mojokerto Regency.

II. RESEARCH METHODS

The location determination was carried out in Trawas District, Mojokerto Regency with the consideration that the research location is one of the Arabica coffee development areas in East Java Province. In addition, Arabica coffee still has land potential for development in large quantities and there are several farmer groups. The sample is part of the number and characteristics possessed by the population (Sugiyono, 2014). The sampling technique used proportional random sampling, meaning that each farmer group was represented by each respondent with a proportional amount. Each farmer group was taken as many as 6, after being multiplied by the number of farmer groups, the sample in this study amounted to 66. This sampling can be used as a need for SEM-PLS analysis tools that can be done with a total sample of 30-100 respondents.

Descriptive analysis techniques in this study were carried out by collecting data from various informants and then compiled and descriptive data analysis techniques used were as follows:

a. Identifying the role of agricultural extension workers in Trawas District, Mojokerto Regency.
b. Conduct direct observations/observations and document related matters related to the role of agricultural extension workers then describe information and present data in the form of text, tables, and images.
c. Descriptive statistical analysis using SPSS on the characteristics of respondents, presents the results of SPSS output in tabular form, then explains it in paragraph form.
d. Conduct descriptive statistical tests using SPSS on respondents' answers, present SPSS output in the form of tables, compare the mean value with the standard deviation value, then explain it in paragraph form.
e. Analyzing the role of agricultural extension workers using a Likert scale to measure farmer group empowerment. The results of the respondent's assessment will be carried out as a percentage of each application of the agricultural extension role variable, then categorized according to the score results.

SEM-PLS analysis consists of two sub models, namely the measurement model or often called the outer model and the structural model or often called the inner model. The measurement model shows how the manifest or observed variables represent the latent variables to be measured. While the structural model shows the power of estimation between latent variables and constructs. Data analysis using smartPLS 3.0 software starts from the measurement model (outer model), structural model (inner model) and hypothesis testing.

1) Evaluation of the Measurement Model (Outer Model)

The outer PLS model defines that each block of indicators is related to its latent variable. Evaluation of the outer model with formative indicators uses substantive content, namely by comparing the magnitude of the weight and seeing the significance of the weight size. Measurement model testing is used to validate the research model built. In summary, to assess the outer model, namely Convergent Validity, Discriminant Validit, Cronbach Alpha and Composite Reliability .

2) Structural Model Evaluation (Inner Model)

Inner PLS model describes the relationship of one variable with another variable. The inner model is used to test the research hypothesis. Testing of the inner model or structural model is carried out to see the relationship between the constructs, the significance value and the R-square of the research model. The structural model was evaluated using R-square for the dependent construct, Stone-Geisser Q-square test for predictive relevance and t-test and significance of the coefficients of structural path parameters.

III. RESULTS AND DISCUSSION

Descriptive Analysis of the Role of Agricultural Extension and Empowerment of Coffee Farmers

Descriptive statistics play a role in analyzing respondents' answers by describing them. The following are descriptive statistics of each research variable:

1) Innovator Variable (X1)

The statement “the extension worker provides the latest ideas on coffee cultivation” or X1.1 results in a never response of 1.5%. Meanwhile, 6.1% of respondents gave infrequent responses, 9.1% of respondents gave less responses and 47.0% of respondents gave frequent responses, and 36.4% of

respondents gave very frequent responses. Based on these data, it can be concluded that extension workers often provide the latest ideas about coffee cultivation.

Variable Statement X1.2 "The extension worker practices directly after providing the latest ideas about coffee cultivation" yields a rare response rate of 3%. Meanwhile, 15.2% of respondents gave less responses, while 37.9% of respondents gave frequent responses and 43.9% of respondents gave very frequent responses. Based on these data, it can be concluded that extension workers have often practiced directly after providing the latest ideas about coffee cultivation.

The statement of the variable X1.3 "The extension worker provides the latest ideas on plant care and pest control, weeds in coffee plants" yields a response never of 3%. Meanwhile, 6.1% of respondents gave infrequent responses, while 15.2% of respondents gave less responses and 40.9% of respondents gave frequent responses, and 34.8% of respondents gave very frequent responses. Based on these data, it can be concluded that extension workers often provide the latest ideas on plant care and pest and weed control on coffee plants.

The variable statement X1.4 "The extension worker provides the latest ideas on harvest and post-harvest handling of coffee plants" resulted in a rare response rate of 3%. Meanwhile, 21.2% of respondents gave less responses, while 39.4% of respondents gave frequent responses and 36.4% of respondents gave very frequent responses. Based on these data, it can be concluded that extension workers often provide the latest ideas on harvest and post-harvest handling of coffee plants.

The statement of the variable X1.5 "The extension worker provides the latest ideas on packaging coffee beans" results in a response that is never 16.7%. Meanwhile, 18.2% of respondents gave infrequent responses, while 28.8% of respondents gave less responses and 30.3% of respondents gave frequent responses, and 6.1% of respondents gave very frequent responses. Based on these data, it can be concluded that extension workers often provide the latest ideas about coffee bean packaging.

2) Innovator Variable (X1)

Statement X2.1 "The extension worker encourages farmers to promote agribusiness in the application of coffee farming" yields a response never of 3.0%. Meanwhile, 1.5% of respondents gave infrequent responses, 19.7% of respondents gave less responses and 40.9% of respondents gave frequent responses, and 34.8% of respondents gave very frequent responses. Based on these data. It can be concluded that extension workers often encourage farmers to advance agribusiness in the application of coffee farming.

Statement X2.2 "The extension worker encourages farmers to take part in the extension about coffee farming" resulted in never and seldom responses of 7.6% each. While 19.7% of respondents gave less response and 33.3% of respondents gave frequent responses, and 31.8% of respondents gave very frequent responses. Based on these data, it can be concluded that extension workers often encourage farmers to take part in various counseling about coffee farming.

Statement X2.3 "The extension worker encourages group members to stay with the coffee farming agribusiness group" resulted in never and seldom responses of 7.6%, respectively. While 21.2% of respondents gave less response and 30.3% of respondents gave frequent responses, and 33.3% of respondents gave very frequent responses. Based on these data, it can be concluded that extension workers often encourage group members to remain in the coffee farming agribusiness group.

Statement X2.4 "The extension worker supports the activities organized by the farmer group" resulted in a never and seldom response of 4.5% each. While 18.2% of respondents gave less response and 37.9% of respondents gave frequent responses, and 34.8% of respondents gave very frequent responses. Based on these data, it can be concluded that extension workers often support activities organized by farmer groups.

The statement X2.5 "The extension worker supports the activities issued by the government on the policy of implementing organic systems in coffee farming" yields a response that is never 4.5%. Meanwhile, 3% of respondents gave infrequent responses, 19.7% of respondents gave less responses and 39.4% of respondents gave frequent responses, and 33.3% of respondents gave very frequent responses. Based on these data. It can be concluded that extension workers often support activities issued by the government regarding policies for implementing organic systems in coffee farming.

Statement X2.6 "The extension worker encourages group members to take part in training held by farmer groups, extension workers, as well as the agriculture/government office" resulting in never and seldom responses of 6.1% each. Meanwhile, 16.7% of respondents gave less response and 42.4% of respondents gave frequent responses, and 28.8% of respondents gave very frequent responses. Based on these data, it can be concluded that extension workers often encourage group members to take part in trainings held by farmer groups, extension workers, or the agriculture/government office.

3) Facilitator Variable (X3)

The statement X3.1 "The extension worker helps members to get a good harvest in coffee farming" yields a never response of 7.6%. While 25.8% of respondents gave less responses, as for 40.9% of respondents gave frequent responses, and 25.8% of respondents gave very frequent responses. Based on these data. It can be concluded that extension workers often help members to get good harvests in coffee farming.

Statement X3.2 "The extension worker helps members to obtain capital, both knowledge and funds for development in coffee farming" yields a never response of 1.5% and a rare response of 3.0%. While 25.8% of respondents gave less response and 45.5% of respondents gave frequent responses,

and 24.2% of respondents gave very frequent responses. Based on these data, it can be concluded that extension workers often help members to obtain capital, both knowledge and funds for development in coffee farming.

Statement X3.3 “The extension worker assists members to attend training held by a government or private institution for the development of coffee farming” resulted in never and seldom responses of 3.0% each. Meanwhile, 22.7% of respondents gave less response and 42.4% of respondents gave frequent responses, and 28.8% of respondents gave very frequent responses. Based on these data, it can be concluded that extension workers often help members to participate in training held by government or private institutions for the development of coffee farming.

Statement X3.4 “The extension worker helps the group to collaborate with government agencies or the agriculture office” yields never and rarely responses of 3.0% and 6.1%, respectively. While 22.7% of respondents gave less response and 37.9% of respondents gave frequent responses, and 30.3% of respondents gave very frequent responses. Based on these data, it can be concluded that extension workers often help groups collaborate with government agencies or the agricultural service.

Statement X3.5 “The extension worker assists the group in developing a work program and design for quality improvement in coffee farming” resulted in never and seldom responses of 4.5% and 7.6%, respectively. While 22.7% of respondents gave less response and 31.8% of respondents gave frequent responses, and 33.3% of respondents gave very frequent responses. Based on these data, it can be concluded that extension workers often assist groups in preparing work programs and quality improvement designs in coffee farming.

4) Communicator Variable (X 4)

The statement X4.1 “The extension worker delivers extension materials and is able to communicate well” results in a response that is never 12.1%. While 24.2% of respondents gave less responses, 36.4% of respondents gave frequent responses, and 27.3% of respondents gave very frequent responses. Based on these data. It can be concluded that extension workers often deliver extension materials and are able to communicate well.

Statement X4.2 “The extension worker conveys information about the good management of coffee plantations” resulted in a never response of 1.5% and a rare response of 15.2%. While 47.0% of respondents gave less response, 36.4% of respondents gave frequent responses. Based on these data, it was concluded that the extension workers did not convey information about the management of coffee plantations properly.

Statement X4.3 “Extensions prepare/have preparation when conveying information about coffee plants during extension activities” resulted in never and rarely responses of 1.5% and 18.2%, respectively. While 42.4% of respondents gave a less response, 37.9% of respondents gave frequent responses. Based on these data, it can be concluded that extension workers are less prepared/prepared when conveying information about coffee plants during extension activities.

Statement X4.4 “The extension worker listens to farmers' complaints when conducting extension activities” yields never and seldom responses of 7.6% and 15.2%, respectively. While 39.4% of respondents gave less response and 37.9% of respondents gave frequent responses. Based on these data, it was concluded that the extension workers did not listen to the complaints of farmers when conducting extension activities.

Statement X4.5 “The extension worker helps the group cooperate with local financial institutions or at least KUD” resulted in never and seldom responses of 16.7% and 19.7%, respectively. Meanwhile, 30.3% of respondents gave less response and 33.3% of respondents gave frequent responses. Based on these data, it can be concluded that extension workers often help groups collaborate with regional financial institutions or at least KUD.

5) Farmer Empowerment Variable (Y)

Y1's statement “Farmers understand every new idea about coffee cultivation given by extension workers when extension activities are carried out” resulting in a response never of 7.6%. Meanwhile 9.1% of respondents gave infrequent responses and 19.7% of respondents gave less responses, while 30.3% of respondents gave frequent responses, and 33.3% of respondents gave very frequent responses. Based on these data. It can be concluded that farmers very often understand every new idea about coffee cultivation given by extension workers when conducting extension activities.

The statement Y2 “Farmers understand every new idea about plant care and pest and weed control in coffee plants given by extension workers when conducting extension activities” resulted in a rare response of 7.6%. While 15.2% of respondents gave less response and 39.4% of respondents gave frequent responses and 37.9% of respondents gave very frequent responses. Based on these data, it can be concluded that farmers often understand every new idea about plant care and pest and weed control on coffee plants given by extension workers when conducting extension activities.

The statement Y3 “Farmers understand every new idea about harvest and post-harvest handling of coffee plants given by extension workers during extension activities” resulted in rare and less than 1.5% and 18.2% responses, respectively. Meanwhile, 42.4% of respondents gave frequent responses. Based on these data, it can be concluded that farmers often understand every new idea about harvest and post-harvest handling of coffee plants given by extension workers when conducting extension activities.

The statement Y4 "Farmers can carry out the packaging process of coffee beans (packaging) according to the direction of the extension worker" resulted in never and seldom responses of 3.0% and 9.1%, respectively. Meanwhile, 25.8% of respondents gave less response and 31.8% of respondents gave frequent responses, and 30.3 % of respondents.

respondents responded very often. Based on these data, it can be concluded that farmers can carry out the packaging process of coffee beans (packaging) according to the direction of the extension worker.

The statement Y5 "Farmers participate in coffee farming extension activities because they are encouraged by extension workers" resulted in never and seldom responses of 6.1% and 7.6%, respectively. While 22.7% of respondents gave less response and 34.8% of respondents gave frequent responses and 28.8% of respondents gave very frequent responses. Based on these data, it can be concluded that farmers often participate in extension activities on coffee farming because they are encouraged by extension workers.

The statement Y6 "Farmers join farmer groups because they are encouraged by extension workers" resulted in never and seldom responses of 3.0% and 7.6%, respectively. While 19.7% of respondents gave less response and respondents gave frequent and very frequent responses, respectively 34.8%. Based on these data, it can be concluded that farmers join farmer group members very often due to the encouragement of extension workers.

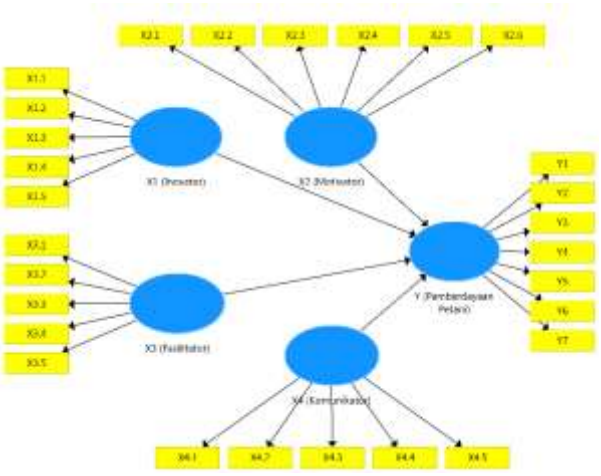
Y7's statement "Farmers are able to develop and implement every work program and design in an effort to improve quality in coffee farming" resulting in never and seldom responses of 4.5% and 9.1%, respectively. While 25.8 respondents gave less response and 37.9% respondents gave frequent responses and 22.7% respondents gave very frequent responses. Based on these data, it can be concluded that farmers have been able to develop and implement every work program and design in an effort to improve quality in coffee farming.

Analysis of the Role of Agricultural Extension and Empowerment of Coffee Farmers

a. Structural Model Design (Inner Model)

The structural model shows the relationship between latent variables in the form of X1, X2, X3, X4, and Y which is based on the formulation of the problem in the study.

Figure 1. Inner Model Design

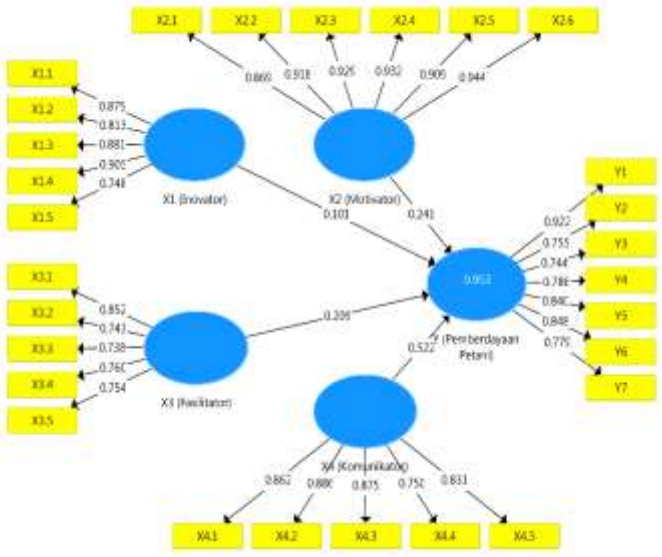


Source: Data processed with Smart PLS 3.0 (2022)

b. Measurement Model Design (Outer Model)

The measurement model describes the relationship between latent variables and each indicator used. In the questionnaire, the intended indicator is a statement. The design of the measurement model through Smart PLS is listed in the following figure.

Figure 2. Outer Model Design



Source: Data processed with Smart PLS 3.0 (2022)

c. Hypothesis Test Results

Hypothesis testing is a test carried out on research hypotheses by conducting a t-test. The test is carried out using the iresampling technique or ibootstrampping and produces a path coefficient. The influence between variables is considered significant at the i5% level if the t-statistic value is greater than the t-table 1.96 (Ghozali & Latan, 2012) (Hair Jr et al., 2014).

Table 4.35 Path Coefficient

	Original Sample (O)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
X1 (Innovator) -> Y (Farmers Empowerment)	0.101	0.033	3,050	0.002
X2 (Motivator) -> Y (Farmers Empowerment)	0.241	0.041	5,880	0.000
X3 (Facilitator) -> Y (Farmers Empowerment)	0.209	0.052	4.039	0.000
X4 (Communicator) -> Y (Farmers Empowerment)	0.522	0.052	9,939	0.000

Source: Smart PLS 3.0 Output (2022)

Based on the table above, the magnitude of the influence between variables can be seen from the coefficient value of each path, so that the influence can be explained as follows:

1) The Influence of the Role of Agricultural Innovators as Innovators (X1) on Farmer Empowerment (Y)

Based on the Path Coefficient (Direct Effect) table, the value of the Path Coefficients of the influence of the independent variable Innovator (X1) on the dependent variable of Farmer Empowerment (Y) is 0.101 or 10.1% with a t-statistic value of 3.050 > 1.96 and a P Value of 0.002 < 0.05 which indicates that the role of agricultural instructors as innovators has a significant positive effect on the empowerment of coffee farmers in Trawas District, Mojokerto Regency or H1 is acceptable. In this study, the extension worker plays the role of an innovator because the extension worker provides the latest ideas or ideas about coffee cultivation, the extension worker also provides the latest breakthroughs on harvest and post-harvest handling. The results of this study are in line with research (Setiyowati, 2018) which shows that the role of agricultural extension workers as innovators has an effect on farmer empowerment.

2) The Influence of the Role of Agricultural Extension as Motivator (X2) on Farmer Empowerment (Y)

The results of data processing in the Path Coefficient (Direct Effect) table show that the independent variable Motivator (X2) has a significant positive effect on the dependent variable of Farmer Empowerment (Y) with a t-statistic value of 5.880 > 1.96 and a significance P Value of 0.000 < 0.05. . And the Path Coefficients value of 0.241 which reflects the motivator has a significant positive effect on farmer empowerment by 24.1% so that H2 can be accepted. In this study, extension workers encourage farmers to advance agribusiness in the application of coffee farming, extension workers encourage farmers to actively participate in counseling about coffee farming, extension workers are also always motivated by encouraging members of farmer groups to take part in training organized by farmer groups, extension workers and from the agriculture office/ government. The results of this study are in accordance with research (Saputri et al., 2016) which shows that the role of agricultural extension workers as a motivator affects farmer empowerment.

3) The Influence of the Role of Agricultural Extension as a Facilitator (X3) on Farmer Empowerment (Y)

Based on the Path Coefficient (Direct Effect) table, the value of the Path Coefficients of the influence of the independent variable Facilitator (X3) on the dependent variable of Farmer Empowerment (Y) is 0.209 or 20.9% with a t-statistic value of 4.039> 1.96 and a P Value of 0.000 <0.05 which indicates that the role of agricultural extension agents as facilitators has a significant positive effect on the empowerment of coffee farmers in Trawas District, Mojokerto Regency or H3 is acceptable. From the research results, extension workers facilitate by helping members to develop work programs and designs for quality improvement in coffee farming. The results of this study are in accordance with research (Muspitasari et al., 2019) which states that the role of agricultural extension workers as facilitators has an effect on farmer empowerment.

4) The Influence of the Role of Agricultural Instructors as Communicators (X4) on Farmer Empowerment (Y)

The results of data processing in the Path Coefficient (Direct Effect) table show that the communicator independent variable (X4) has a significant positive effect on the dependent variable of Farmer Empowerment (Y) with a t-statistic value of 9.939 > 1.96 and a significance P Values of 0.000 < 0.05 . And the Path Coefficients value of 0.522 which shows the communicator independent variable (X4) has a significant positive effect on the dependent variable of Farmer Empowerment (Y), so H4 can be accepted. In this study, extension workers act as communicators by delivering extension materials and communicating well, extension workers also listen to complaints from members of farmer groups during extension activities. The results of this study are in accordance with research (Marbun, et al., 2019) which states that the role of agricultural extension workers as communicators has an effect on farmer empowerment.

IV. CONCLUSION

The role of agricultural extension agents as innovators has a significant positive effect on the empowerment of coffee farmers in Trawas District, Mojokerto Regency. As an innovator, extension workers provide the latest ideas or ideas about coffee cultivation, extension workers also provide the latest breakthroughs on harvest and post-harvest handling . The role of agricultural extension workers as motivators has a significant positive effect on farmer empowerment. Extension workers encourage farmers to advance agribusiness in the application of coffee farming, extension workers encourage farmers to actively participate in counseling about coffee farming, extension workers also always motivate by encouraging members of farmer groups to take part in training organized by farmer groups, extension workers or from the agriculture/government office. The role of agricultural instructors as facilitators has a significant positive effect on the empowerment of coffee farmers in Trawas District, Mojokerto Regency. Extension workers facilitate by helping members to develop work programs and quality improvement plans in coffee farming. The role of agricultural instructors as communicators has a significant positive effect on the dependent variable of Farmer Empowerment. Extension workers act as communicators by delivering extension materials and communicating well, extension workers also listen to complaints from members of farmer groups during extension activities.

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