Performance of farming extension field during the COVID-19 pandemic in East Java

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Abstract. The success of farming extension activities cannot be separated from the role of farming extension workers. In this pandemic, farming extension counseling must be continue to make good environment. Social and physical distancing can make limited access for farming extension workers in carry out their roles. The purpose of this study was to analyze the performance of farming extension field and the influenced factors of performance farming extension field during the pandemic in East Java. This research is located in East Java province, it was conducted from March 2020 to 2021. The sampling was carried out by cluster random sampling and it got 360 respondents. The data collected by using statistical descriptive analysis which is used a scale and multiple linear regression model. The result of this research during the pandemic was going well. Meanwhile, the was the factors that influence in performance of farming extension (age, work training, topography and availability of infrastructure) but distance, farmer group, and education did not have impact on it.

1. Introduction
Agriculture counseling is the application of scientific research and new knowledge to agricultural practices through farmer education. The success of farming extension activities cannot be separated from the role of farming extension workers. Agricultural instructors are people who work in extension activities by communicating to farmer as targets, so it can make good targets [1]. Farming extension workers in Indonesia are spread throughout village and region from the national level to the sub-district. Agricultural Extension and Human Resource Development Agency divides farming extension workers into four group (civil servants, agricultural extension workers, Employed Daily Workers for Agricultural Extension Assistants and private extension workers) [2]. Civil servants agricultural instructors has more responsibility duties from agricultural scope.

The farming extension field is not only as a disseminator of technology and information, but also as a motivator, dynamist, consultant and facilitator for farmers. In addition, farming extension field must be able to diagnose the problems faced by farmers [3]. In this role, Agricultural instructor has competence which is divided into two categories, the first was Threshold Competencies, the main character that must be possessed by an extension worker to be able to carry out his work including basic knowledge or skills. The second was Differentiating Competencies, the factors that distinguish between extension workers who have high performance with those who have low performance [4]. This performance can be measured through several indicators, including the arrangement of extension programs, the preparation of an annual work plan (RKT), agricultural extension workers, the compilation of regional map data for the development of site-specific technology, the dissemination of...
agricultural technology information for farmers, a profitable business partnerships, farmers access, market information, increasing production facilities, and increasing farmers' income and welfare [5].

The COVID-19 pandemic implement social and physical distancing, which have limited activity for farming extension workers in carrying out their role as motivators and facilitators for farmers [6]. This becomes a problem for agricultural extension workers. In this situation farmingl extension workers used social media as alternative extension media to connect with farmer [7]. Farming extension workers are agents of change who are directly related to farmers. The focus of this study is to analyze the performance of farming extension field and the factor which is have effect in farming extension during the COVID-19 pandemic in East Java. The research refers to the Minister of Farming Regulation No. 91 of 2013 covering planning, implementation and evaluation of extension.

2. Materials and methods

2.1. Materials

This research is an analytical descriptive study and located in East Java Province. It was started on March 2020 to March 2021. The sampling was using cluster random sampling. According to [8]. This is used if the population consists of individual groups or clusters. The cluster determination was based on Regional Coordination Agency and 10 regencies/cities were taken with the highest number of Agricultural Extension, as research areas includ Ponorogo, Nganjuk, Lamongan, Mojokerto, Malang, Pasuruan, Sumenep, Sidoarjo, Jember and Bondowoso. Respondents in this study were 360 people. The data collection methods were carried out by Observation, Interview, Questionnaire, Focused Group Discussion (FGD) and Documentation Study.

2.2. Methods

To analyze the level of performance of farming extension workers during the COVID-19 pandemic, researchers used a indicators referring to Ministry of Farming No. 91 of 2013 covering planning, implementation and evaluation of extension. Meanwhile, to find out the factors that influence the performance of field agricultural instructors (PPL) during the COVID-19 pandemic, it will be analyzed using multiple linear regression. Multiple linear regression is a regression that has one independent variable and two or more independent variables [10]. The dependent variable (Y) in this study was the level performance of extension workers, while the independent variable (X) refer to influence the dependent variable is age, education, amount of training, number of assisted groups, availability of facilities and infrastructure, distance to the target area and topography of the target area. The equation model for the analysis is as follows:

\[ Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + D_1 + D_2 + e \]

means:

- \( Y \) = Performance level of field agricultural extension (PPL)
- \( X_1 \) = Age (years)
- \( X_2 \) = Number of trainings (times)
- \( X_3 \) = Number of assisted groups (group)
- \( X_4 \) = Distance to work place (km)
- \( X_5 \) = Education (years)
- \( D_1 \) = Topography (dummy 1 if the topography is flat or 0 if the topography is hilly)
- \( D_2 \) = Availability of facilities and infrastructure (dummy 1 if the smartphone is functioning well or 0 if the smartphone is not functioning well)
3. Results and discussion

3.1. Farming extension performance during the COVID-19 pandemic in East Java

The performance of farming extension workers can be measured from three indicators, (1) extension planning, (2) implementation, and (3) evaluation of extension. Extension planning can be seen from the preparation of regional and agro-ecosystem potential data, the assistance in the preparation of the RDKK, the preparation of extension programs and the preparation of the RKTPP. The indicators for the implementation of extension consist of dissemination of material, implementation of extension methods, capacity building of farmers, growth of farmer institutions, economic growth of farmer institutions, and the increasing production. Meanwhile, the extension evaluation indicators consist of the implementation of extension evaluation and report generation.

| No. | Parameters | Score | Category |
|-----|------------|-------|----------|
| 1   | Preparation of the extension program |       |          |
| a.  | Making regional and agroecosystem potential data | 100   | Highly good |
| b.  | Assistance in the preparation of the RDKK | 100   | Highly good |
| c.  | Preparation of agricultural extension programs | 100   | Highly good |
| d.  | Making of RKTPP | 100   | Highly good |
| 2   | Implementation of extension |       |          |
| a.  | The implementation of dissemination or distribution of materials according to farmer needs | 71    | Enough |
| b.  | The implementation of farming extension methods in the target areas in the form of visits (individual, group or in bulk) | 96    | Highly good |
| c.  | The implementation of agricultural extension methods in developed areas in the form of demonstrations or SL | 43    | Bad |
| d.  | The implementation of the application of farming extension methods in the target areas in the form of meetings (field meetings, talks, technical meetings, work meetings and business meetings) | 86    | Good |
| e.  | The implementation of farming extension methods in the target areas in the form of courses | 51    | Not good |
| f.  | Increasing the farmer capacity to access information | 85    | Good |
| g.  | Growing farmer groups in terms of quality and quantity | 78    | Good |
| h.  | The increasing farmer class groups in terms of quantity and quality | 32    | Bad |
| i.  | Farmer institutional economic growth | 32    | Bad |
| j.  | Increasing the superior production of the target area | 83    | Good |
| 3   | The evaluation |       |          |
| a.  | The implementation of counseling evaluation | 75    | Enough |
| b.  | Preparation of evaluation reports | 78    | Good |
| Total |       | 76    | Good |

Table 1 shows that the performance of farming extension workers during the COVID-19 pandemic in East Java Province was quite good. This is because 5 performance indicators indicate a very good category, 5 indicators indicate a good category, 2 indicators indicate a sufficient category, 1 indicator
indicates a poor category, and 3 indicators indicate a poor category. Meanwhile, the overall performance of Farming Extension (PPL) during the COVID-19 pandemic was quite good category. According to [11] extension workers are required to have a work program and annual work plan which are usually prepared jointly at the BPP office by the extension worker based on the results of observations and situation analysis carried out.

The indicator that has a low score is the implementation of counseling by using the field school method and courses. It happened because of the pandemic. However, based on field results, direct visits to individuals are considered more effective than counseling using information and communication technology assistance. According to [12] individual communication direct face-to-face is more effective in conveying messages. While according to [6] agricultural extension workers chose the direct extension method with farmers for technical education.

3.2 The effecting factor of farming extension during the COVID-19 pandemic in East Java

After performing multiple linear regression analysis, it can be concluded the similarity of variable which is include of age, training essence, assisted of farmer groups, distance, topography, and availability of facilities and infrastructure of farming extension workers during the COVID-19 pandemic in East Java Province;

\[ Y = 59.637 + 0.266X_1 + 0.106X_2 + 0.132X_3 - 0.006X_4 + 0.010 X_5 + 0.850D_1 + 2.803D_2 \]

means:

- \( Y \) = Farming extension performance
- \( X_1 \) = age
- \( X_2 \) = number of training
- \( X_3 \) = number of assisted farmer groups
- \( X_4 \) = distance
- \( X_5 \) = education
- \( D_1 \) = topography
- \( D_2 \) = availability of facilities and infrastructure

3.2.1. Age. The age variable has coefficient regression of 0.266, it means if the age of the instructor increases by one unit, it will increase the performance of the agricultural instructor by 0.266. Based on the results of the analysis, the age variable has a significant effect on the performance of the instructor. According to [13] the mature of the age, the higher the level of performance of farming extension workers.

3.2.2. Amount of training. The variable number of trainings has a regression coefficient of 0.266 indicating that if the number of trainings followed increases by one unit, it will increase the performance of agricultural instructors by 0.266 units with the assumption that other variables are considered constant. Based on the analysis results, the variable amount of training have a significant effect on the performance of the instructor. This happened because during the COVID-19 pandemic there was free training for extension workers by online, so don't depend on budget availability. This is supported by [14] that the low frequency of technical training attended by farming extension workers due to the lack of budget managed by the BP4K institution, so that farming extension workers rarely attend offline training.

3.2.3. Number of assisted farmer groups. The assisted farmer group variable has a regression coefficient of 0.106 indicating if the number of assisted farmer group increases by one unit, it will increase the performance of the agricultural instructor by 0.106 units which the other variables were considered constant. Based on the results of the analysis, the variable number of assisted farmer groups did not have a significant effect on the performance of the extension workers. During the COVID-19 pandemic, visiting farmers activity was changed, so to assist the role of farming workers, the head of farmer groups was directed to be more active as a liaison between farming workers and
farmers. This is supported by the research of [15] that the number of assisted farmer groups does not significantly affect the performance of agricultural extension workers.

3.2.4. Distance. The distance variable has a regression coefficient of -0.006 indicating that if the distance increases by one unit, it will decrease the performance of the agricultural instructor by 0.006 units with the assumption that other variables are considered constant. Based on the results analysis, the distance variable did not have a significant effect on the performance of the instructor. This is supported by the research of [9] that distance does not significantly affect the performance of agricultural extension workers.

3.2.5. Education. The education variable has a regression coefficient of 0.010 indicating that if education increases by one unit, the performance of agricultural instructors will increase by 0.010 units with the assumption other variables were considered constant. However, this variable did not have a significant effect on the performance of the instructor. This increase in the performance of farming workers was not only obtained from formal education but also informal education such as training and learning with farmers in the field.

3.2.6. Topography. The topographic variable has a regression coefficient of 0.850, indicating the performance of the instructor in a flat topography is 0.850 higher than hilly topography area. This variable have a significant effect on the performance of the instructor during the Corona Virus Deses Pandemic.

3.2.7. Availability of facilities and infrastructure
The variable availability of suggestions and infrastructure has a regression coefficient of 2.803, indicating that the performance of the instructor with the availability of good infrastructure is higher at 2.803. This variable has a significant effect on the performance of the instructor. During the COVID-19 pandemic the availability of facilities mobile phones has properly function. It will support the performance of the extension workers because many activities are carried out online. Good facilities and infrastructure are supported by the competence of human resources. directly affect a person's performance [16].

4. Conclusions
The performance of field agricultural instructors (PPL) in the province of East Java is good enough, although there were some implementations changes such as counseling activities by individual visiting with strict health protocols for technical materials. Extension workers also utilize communication and information technology, therefor, their implementation was considered ineffective. The variables that significantly affect the performance of the instructor are age, number of trainings, topography and the availability of facilities and infrastructure. Meanwhile, the number of fostered farmer groups, distance, and education did not significantly affect the performance of the field agriculture workers during the COVID-19 pandemic in East Java Province. Based on the research conducted, to improve the performance of field farming instructors (PPL) during the Corona Viruse Desesase pandemic is to increase the ability or resources in the use of information and communication technology, especially for farmers. In addition, the use of information and communication technology must be balanced with face-to-face personal communication, because that was the most effective method, even though it was in limited numbers and applies with strict health protocols.

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