Journal of Hexagro. Vol. 7. No. 1 February 2023 P-ISSN: 2459-269E-ISSN: 2686-3316
DOI: 10.36423/hexagro.v7i1.915

FACTORS AFFECTING THE PERFORMANCE OF FIELD AGRICULTURAL EXTENSIONS IN THE COVID-19 PANDEMIC PERIOD IN PADANG PARIAMAN REGENCY

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Submitted: 27th February 2022; Revised: 21st July 2022; Published: 1st February 2023

ABSTRACT

Agricultural instructors must deal with problems in the agricultural sector during the Covid-19 period. The objectives of this study are 1) to analyze the characteristics of agricultural extension workers in the district of Padang Pariaman. 2) Analyzing what factors affect the performance of Field Agricultural Extension Officers during the Covid-19 pandemic. The sampling technique used in this research is census sampling. The data analysis methods used in this research are descriptive qualitative and quantitative analysis using multiple linear regression analysis. The results showed that the characteristics of agricultural extension workers in Padang Pariaman Regency were dominated by female extension workers, with a productive age range of 53-61 years. The most education was Bachelor of Agriculture, with work experience in the range of 12-16 years, with the number of assisted farmer groups 17-61 years. 20, the largest working area with a range of 62-73 km² is two people, while the respondents with the smallest working area in the range of 3.03-14 Km² are 22. Competence is a factor that affects the performance of Field Agricultural Extension Officers (PPL) during the covid-19 period in Padang Pariaman Regency.

Keywords *: Covid-19; Extension Performance; Agriculture*

ABSTRACT

Penyuluh pertanian berkewajiban menangani permasalahan yang ada di sektor pertanian pada masa covid-19. tujuan penelitian ini adalah 1) Menganalisis karakteristik Penyuluh Pertanian lapangan di Kabupaten Padang Pariaman. 2) Menganalisis faktor-faktor yang mempengaruhi kinerja Penyuluh Pertanian lapangan dimasa pandemi Covid-19. Teknik sampel yang digunakan yaitu *sampling sensus.* Metode analisis data yang digunakan dalam penelitian ini adalah analisis regresi linier berganda. Hasil penelitian yang diperoleh adalah Karakteristik penyuluh pertanian lapangan di Kabupaten Padang Pariaman didominasi oleh penyuluh berjenis kelamin perempuan, dengan rentang umur produktif 53-61 tahun, Pendidikan terbanyak S1 pertanian, dengan pengalaman kerja berada pada rentang 12-16 tahun dengan jumlah kelompok tani binaan 17-20, luas wilayah kerja paling besar dengan rentang 62-73 km² sebanyak 2 orang, sedangkan responden dengan wilayah kerja terkecil dalam rentang 3.03-14 Km² sebanyak 22. Faktor kompetensi adalah faktor yang berpengaruh terhadap kinerja Penyuluh Pertanian Lapangan (PPL) pada masa covid-19 di Kabupaten Padang Pariaman.

Kata kunci: Covid-19; Kinerja Penyuluh; pertanian

INTRODUCTION

The World Health Organization (WHO) argues that *Coronaviruses* (*Cov*) is an epidemic that affects the respiratory system. Efforts made by the government in dealing with, preventing, and breaking the chain of transmission of COVID-19, are imposing restrictions on activities outside the home, prohibiting gatherings and crowds, working from home, and so on. The existence of restrictions on people's movements dramatically impacts the

decrease in community productivity. One of the sectors that have influenced the Covid-19 pandemic is the agricultural sector. (Ferdi, 2020). Within the agricultural sector, there are several sub-sectors, such as food crops, horticulture, plantations, and forestry. The sector that became a mainstay during the pandemic was food crops. The main food commodity for Indonesian people is rice.

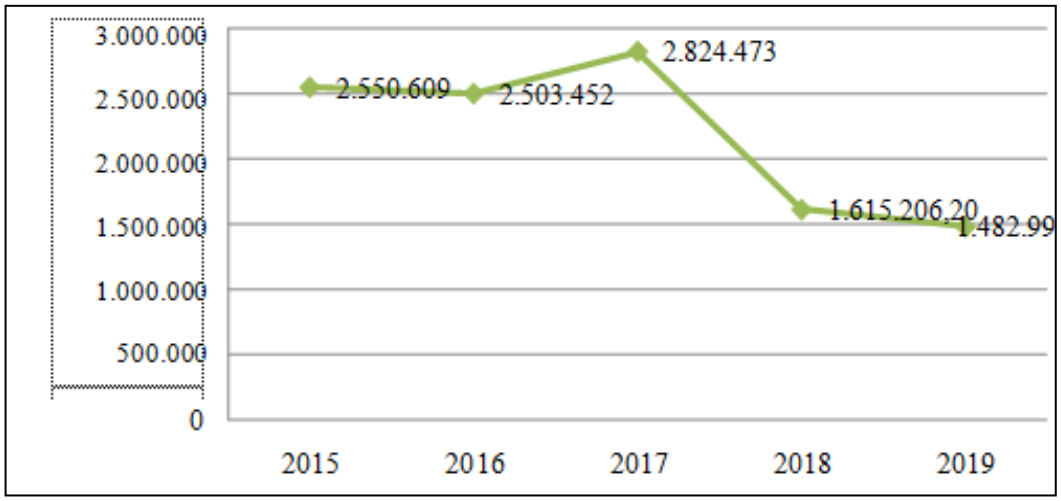


Figure 1. Rice Crop Production in West Sumatera in 2015 – 2019. Source: West Sumatra BPS 2020

Based on the Central Bureau of Statistics data in 2020, rice production in West Sumatra has fluctuated for the last five years (2015-2019). Where in 2015, rice production in West Sumatra was 2,550,609 tons. In 2016 rice production decreased by 47,157 tons, and in 2017 it experienced a significant increase of 321,021 tons. The most significant decrease occurred in 2018 of 1,209,266.8 tonnes (Figure 1). This production occurred due to the shift in land use from rice to other crops such as corn, onions, and other commodities. In addition, the decline was also caused by land conversion to settlements (Hendra, 2021).

Padang Pariaman Regency is one of the rice production centers in West Sumatra Province (Appendix 1). The productivity of Padang Pariaman's rice plants is the highest compared to other West Sumatra districts.

Table 1 shows that the productivity of rice plants in Padang Pariaman Regency in the last five years (2015-2019) has fluctuated. In 2018 there was a significant increase of 3.45 tonnes/ha. This increase happened because the government succeeded in developing local varieties of rice which have high production advantages over others and are resistant to pests and diseases (Kominfo, 2019). Farmers' efforts to increase their production depend on natural conditions so that

the production process cannot be separated from various problems. The institution obliged to handle this problem is the District Counseling Center (BPK) which is spread in every sub-district in Padang Pariaman. An extension instructor is a person who has a role in providing learning and guidance and handling various problems, such as the agricultural sector.

Table 1 Development of harvested area, production, and productivity of rice plants in Padang Pariaman Regency in 2015 - 2019.

No	Year	Harvested area (Ha)	Production (Tons)	Productivity (Tons/Ha)
1	2015	55,112.00	278,127.00	5.05
2	2016	55,408.00	287,046.00	5,18
3	2017	61,135.00	321,376.00	5,26
4	2018	32186.61	280,360.00	8,71
5	2019	32,362.44	155,475.10	4.80

Source: BPS Padang Pariaman Regency, 2020

According to Sumardjo (2020), the agricultural extension strategy during the Covid-19 pandemic was to maximize the potential management of local resources by strengthening human capital, social capital, and digital communication. In previous studies, it was explained that the extension strategy was carried out by formulating extension plans according to the needs of farmers, preparing work plans, and making regional maps for the development of only commodities. After that, extension workers immediately went down to the field to provide guidance and directions, such as eradicating pests (Lesmana, 2018). During the Covid-19 pandemic, all counseling activities were carried out *online* using *WhatsApp group*s or other social media. In addition, if visits are conducted face-to-face, the number of farmers attending is limited to 30 percent of the total number of farmers. Therefore, the farmers who attended the meeting were represented by the group leader with the group secretary or treasurer. During the meeting, farmers were required to use a system of *social distancing* and *psychological distancing*. There was a change in the agricultural extension system during the Covid-19 pandemic, so the research objective was to analyze the characteristics of field agricultural extension workers in Padang Pariaman Regency. Analyzing the factors influencing the performance of field agricultural extension workers during the Covid-19 pandemic.

RESEARCH METHODS

Location and time

This research was conducted in Padang Pariaman Regency. The research location was determined *purposively* with the following considerations: (1) Padang Pariaman Regency is one of the rice production centers in West Sumatra; (2) Padang Pariaman Regency is one of the areas

affected by the Covid-19 pandemic. Research activities will be carried out in May - June 2021.

Data Types and Sources

The data used are primary and secondary. Primary data was obtained directly by filling out a list of questions (questionnaire) with members of the agricultural extension field status as Civil Servants (PNS). Primary data collected were gender, age, formal education, work experience, area of work, and the number of assisted farmer groups. Secondary data is a source of data obtained by researchers indirectly. Secondary data were obtained from agencies, including the Statistics Agency for Padang Pariaman Regency, including Socio-economic characteristics of Padang Pariaman Regency, Total population and workforce of Padang Pariaman Regency, Geographical conditions of Padang Pariaman Regency, Data on production and area of rice fields and food crops in Padang Pariaman Regency, Data the number of BPPs in Padang Pariaman Regency.

Population and Sample

The researchers' population were field agricultural extension workers spread across Padang Pariaman Regency, namely as many as 45 civil servants because extension workers with PNS status had a fixed work area and the workload of PNS was heavier than THL TBPP. The sample used is *census sampling*. Census sampling is a technique in which all population members are used as samples (Sugiyono, 2010).

Data analysis

Analyzing Field Agricultural Extension Characteristics

To see the characteristics of the respondents, such as age, work experience, the number of assisted farmer groups, and the area of work by using intervals with the formula:

K= 1+3,3 (Log n)

Source: Sugiyono, 2009

$$i = \frac{Nilai\ Max - Nilai\ Min}{K}$$

Analyzing Factors -Factors Influencing the Performance of Agricultural Field Extension Workers during the Covid-19 Period

Analysis of the data used to analyze the Factors Affecting the Performance of Agricultural Field Extension Workers during the Covid-19 Period:

a) Validity test

The formula for conducting the

$$Rxy \frac{n\Sigma(XY) - \Sigma X \Sigma Y}{\sqrt{\{nx2 - (\Sigma x)2\}\{n\Sigma y2 - (\Sigma y)\}}}$$

Information:

Rxy = Correlation coefficient between item scores and total scores
n = number of respondents
x = Item score
y = Total score
Σx = Total score of the item
Σy = Sum of total scores

b) Reliability Test

Instrument reliability testing was carried out using the *Alpha-Cronbach formula* as follows: (Wiring, 2015)

Formula:

$$r_i = \frac{k}{(k-1)}\left[\frac{\acute{o}Si^2}{Sj^2}\right]$$

Information:

ri = Alpha correlation coefficient

k = Number of question items or question items

Si² = number of item variants or score of each item

Sj² = Total variances or total score

c) Multiple Linear Regression Analysis

$$Y = a+b_1.X_1+b_2.X_2+b_3.X_3$$

Information:

Y = Extension performance

a = Constant

b 1, b 2 = Regression coefficients

X1 = Extension Characteristics

X2 = Extension Competency

X3 = Instructor's Motivation

d) Classical Assumption Test

1. Normality test

According to Priyatno (2010), the criteria for decision-making are as follows:

- The data is usually distributed if the significant value is alpha (α) ≥ 0.05.
- If the significant value is alpha (α) ≤ 0.05, the data is not normally distributed.

2. Multicollinearity Test

According to Santoso and Priyatno (2010), the criteria for decision-making are as follows:

- If the va*riance inflation factor* (VIF) value ≤ 10, then the variable does not experience multicollinearity problems.
- If the va*riance inflation factor* (VIF) value≥ 10, then the variable is experiencing multicollinearity problems.

3. Heteroscedasticity Test

According to Priyatno (2010), the criteria for decision-making are as follows:

- If the significant value of alpha (α) ≥ 0.05 means, the data does not have heteroscedasticity problems.
- If the significant value of alpha (α) ≤ 0.05 means that the data has a heteroscedasticity problem.

e) t test (Partial)

Formula:

$$t_{hitung} = \frac{r\sqrt{(n-2)}}{\sqrt{(1-r^2)}}$$

Information:

t = calculated t value

r = Correlation

n = number of samples

r ² = Coefficient of determination

f) U Ji F with the formula:

$$t_{hitung} = \frac{r\sqrt{(n-2)}}{\sqrt{(1-r^2)}}$$

Information:

F count = The magnitude of F count

n = number of samples

k = number of variables

R^2 =Coefficient of determination

g) Test of the Coefficient of Determination (R ²)

Formula

$$R^2 = \frac{b_1\Sigma x_1 y + b_2\Sigma x2y}{\Sigma y^2}$$

where:

R2 =Coefficient of determination

b1 = Correlation Coefficient

b2 = The square of the difference between the Y value and the average Y value

Results and Discussion

Analyzing the Characteristics of Field Agricultural Extension in Padang Pariaman Regency.

Characteristics of the respondent are to describe the identity of the respondent who has been determined. One purpose of describing the respondents' characteristics is to provide an overview of the samples in this study.

Table 2 Number of extension workers by sex in Padang Pariaman District.

Gender	Number of people)	Percentage (%)
Man	20	44,44
Woman	25	55,56
Amount	45	100.00

Source: primary data (processed)

Table 2 shows that women dominate the sex of agricultural extension workers. Working as an agricultural extension requires a lot of interaction in the field with farmers and through rough terrain. Counseling in Indonesia is not measured by gender but by competence and performance (Yani, 2019). According to Donnell y (1996), no data supports that men or women are good workers.

Table 3 Number of extension workers by age level in Padang Pariaman District

Age Group (Years)	Number of people)	Percentage (%)
31-34	4	8.89
35-39	8	17.78
40-43	4	8.89
44-48	7	15.56
49-52	2	4,44
53-57	10	22,22
58-61	10	22,22
Amount	45	100.00

Source: primary data (processed)

Table 3 shows the dominating extension agents with an age range of 53-61. The age of agricultural extension workers in Padang Pariaman Regency is productive. Productive age is ideal for work and can increase productivity (Afirudin, 2018). Previous research explained that workers during productive periods could provide better performance (Hasanah, 2011).

Table 4 Number of extension workers based on education level in Padang Pariaman Regency.

formal education	Number of people)	Percentage (%)

SENIOR HIGH SCHOOL	5	11,11
D3	10	22,22
D4	4	8.89
S1	23	51,11
S2	3	6,67
Amount	45	100.00

Source: primary data (processed).

Table 4 shows that the education level of the respondents was dominated by 23 extension workers with SI education or the equivalent of 51.11 percent. Education is an effort to develop one is potential to have intelligence, character, and skills. Agricultural extension workers with a good education level will be able to work well (Peranginangin, 2016). According to Juliana (2015), the level of education can increase work productivity better.

Table 5 Number of extension workers based on work experience in Padang Pariaman Regency.

Work Experience (Years)	**Number of people)**	**Percentage (%)**
7-11	7	15.56
12-16	15	33,33
17-20	1	2,22
21-25	2	4,44
26-30	10	22,22
31-35	6	13,33
36-40	4	8.89
Amount	45	100.00

Source: primary data (processed)

Table 5 shows that respondents are dominated by work experience with work experience in the range of 12-16 years. Work experience can shape the performance of an instructor. Based on research conducted by Suriati (2017) states that if someone has worked for a long time, it can give a good impression so that the knowledge gained will be stored for a long time. Another study explained that increasing work experience could improve a person's performance (Banunaek, 2020).

Table 6 shows that the respondents with the most assisted farmer groups were in the 17-20 range, namely 24.44 percent. Agricultural Extension is a means of education for farmers. Theresia (2012) states that the number of assisted farmer groups indicates an excellent cooperative relationship between extension agents and farmers so that extension objectives can be adequately achieved.

Table 6 Number of extension agents based on the number of assisted farmer groups in Padang Pariaman Regency.

Number of Assisted Farmer Groups (groups)	Number of people)	Percentage (%)
6-9	2	4,44
10-12	5	11,11
13-16	9	20.00
17-20	11	24,44
21-24	8	17.78
25-27	7	15.56
28-31	3	6,67
Amount	45	100.00

Source: primary data (processed)

Table 7 The number of extension workers based on the area of work in Padang Pariaman Regency.

Working Area (Km ^{2})	Number of people)	Percentage (%)
3.03-14	22	48,89
15-26	12	26,67
27-38	5	11,11
39-20	3	6,67
51-61	1	2,22
62-73	2	4,44
Amount	45	100.00

Source: primary data (processed)

Table 7 shows that 22 respondents were dominated by extension agents with an area of work ranging from 3.03-14 Km² or equivalent to 48.89 percent. The affordability of the target area will support the extension implementation process. The wider the extension area, the more difficult it will be for extension agents to reach their target area quickly, increasing operational costs while counseling (Banunaek, 2017).

Analyzing the Factors Influencing the Performance of Field Agricultural Extension Workers During the Covid -19 Pandemic

1) Instrument Test Results

Test Validity and reliability

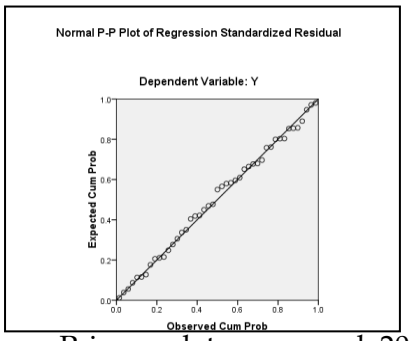
Based on Appendix 2 shows that the results of the validity test conducted on 45 respondents stated that the competence and motivation variables were declared valid. This motivation variable can be concluded by seeing that each variable has a greater r-critical than the r-table, with the result that is a statement of competence and significant motivation variables from the r_{table} of 0.294.

Based on Appendix 2, it can be concluded that the reliability test produced Cronbach's alpha values for competency and motivation variables is reliable because Cronbach's alpha values produced are more significant than 0.600. I am

statements included in the reliable category, and these variables can be used as measuring instruments in this research.

2) Classic assumption test

(1) Normality test



Source: Primary data processed, 2021

Based on the picture shows that the regression model is distributed normally. According to Ghozali (2012), the regression model is stated normal distribution if the plotting data (dots) that describe the actual data follow the diagonal line.

(2) Multicollinearity Test

Multicollinearity test results

Model	Collinearity Statistics	
	tolerance	VIF
1 (Constant)		
Characteristics (X1)	.986	1014
Competency (X2)	.982	1.018
Motivation (X3)	.982	1.018

Source: Primary data (processed)

Table 4.11 shows the results of the multicollinearity test. It can be concluded that there are no symptoms of multicollinearity from the data obtained. This indicator can be seen from the *tolerance values* obtained for all variables above 0.1 (according to regulations) and VIF values below 10 (according to regulations), which indicates that the processed data is free from multicollinearity.

(3) Heteroscedasticity Test.

Table 9 Heteroscedasticity Test Results

Spearman's rho	**Unstandardized Residual**
Sig. (2 -tailed)	
Characteristics (X1	0.865
Competency (X2)	0.787
Motivation (X3)	0.930

Source: Primary data processed, 2021

Based on table 4.12, it can be concluded that there are no symptoms of heteroscedasticity between the independent and dependent variables. Ghozali (2012) states there is no heteroscedasticity if the sig. (2-tailed) is more than 0.05 means that the variable tested does not contain heteroscedasticity.

3) Multiple Linear Regression Test

Based on data analysis using the *SPSS* 16.0 *for windows program*, the results of the regression equation are obtained as follows:

$$Y = -2{,}242 + 0.147X1 + 0.811X2 - 0.025X3 + e$$

The regression equation above partially shows the relationship between the dependent and independent variables. From these equations, it can be concluded that:

(a) The value of the characteristic regression coefficient (X1) is a positive sign of 0.147 means that every increase or decrease in the characteristic variable by one unit and the value of the other variables remains the same. The

extension worker's performance will increase by 0.147 units.

(b) The value of the competency regression coefficient (X2) is a positive sign of 0.811, meaning that for each increase or decrease in the competency variable by one unit and the value of the other variables remains the same. The extension worker's performance will increase by 0.811 units.

(c) The value of the motivational regression coefficient (X3) is negatively marked 0.025, meaning that every time the motivation variable increases or decreases by one unit and the values of other variables are constant, the instructor's performance will decrease by 0.025 units.

4) Hypothesis testing

(a) t-test (partial)

Table 10 Multiple Linear Regression Analysis Test

Model	*Unstandardized Coefficients*		*Standardized Coefficient*	Q	*Sig*
	B	Std. Error	Betas		
1 (Constant)	-2,242	8031		-.279	.782
Characteristics (X1)	.147	089	.182	1,647	.107
Competency (X2)	.811	.134	.673	6,074	.000
Motivation (X3)	-.025	.226	-.012	-.109	.914

a. Dependent Variable: instructor performance (Y)
Source: Primary data processed, 2021

Based on the results obtained, it can be explained as follows:

(a) A hypothesis test analysis at the confidence level α = 5 percent that the characteristic variable (X1) is positive and has no significant effect on the performance of field agricultural extension workers during the Covid-19 pandemic in Padang Pariaman Regency. Evidenced by t count < t table = 1.647 < 2.020 and a significant value of 0.107 > 0.05, H_{0} is accepted, and H_{1} is rejected. This result followed research conducted by Roza, Elka (2018), Sapar & Butami (2017), which states that characteristic variables have no significant effect on the performance of field agricultural extension workers. Because although Extension agents have a high level of education and are of productive age, the size of the target area and the number of target groups not accompanied by work experience will not affect the performance of the field agricultural extension agents.

(b) An analysis of the hypothesis test at the confidence level α = 5 percent that the competency variable is positive and has a significant effect on the performance of field agricultural extension workers during the

Covid-19 pandemic in Padang Pariaman Regency as evidenced by t count > t table = 6.074 > 2.020. Moreover, a significant value of 0.000 < 0.05, H_0 is rejected, and H_1 is accepted. This result is in accordance with research conducted by Hanifah, Rasyid (2013), and Harahap & Rosita (2017). Nuraeni (2021) states that competency variables significantly affect the performance of field agricultural extension workers. Because of competence, extension agents are influenced by planning, implementation, and evaluation aspects. At the beginning of each year, extension agents make data on potential areas and compile the RDKK. However, during the Extension implementation, Indonesia was affected by the Covid-19 pandemic. As a result, the implementation of counseling is not in accordance with the plan. The counseling method has changed to using online media. If the meeting continues, the number of farmers will be limited to 30 percent of the average number.

(c) A hypothesis test analysis at the confidence level α = 5 percent that the competency variable is negative. The variables have no significant effect on the performance of agricultural extension workers during the Covid-19 pandemic in Padang Pariaman Regency, evidenced by t count < t table -0.109 < 2.020 and a significant value of 0.914 > 0.05, then H_0 is accepted, and H_1 is rejected. This result was consistent with research conducted by Wibowo HT (2020), Rosita, Restuhadi (2018), and Lesmana (2016), which states that motivational variables have no significant effect on the performance of field agricultural extension workers. Motivation is influenced by three aspects which include the need for achievement, the need for affiliation, and the need for power. Hi, this was caused because, during the Covid-19 pandemic, counseling was carried out online, but many extension workers did not understand online media.

(b) F test (simultaneous)

Table 1 1 F test (simultaneous)

Model	***Sum of squares***	***Df***	***Mean square***	***F***	***Sig.***
Regression	184,749	3	61,583	14.023	.000 [a]
residual	180,051	41	4,391		
Total	364,800	44			

a. *Predictors: (Constant),* characteristics, competence, motivation
b. *Dependent*: instructor performance

Source: Primary data processed, 2021

Based on the test results in the table, it can be seen that the calculated F value is 14.023. The F table value

or df $_2$ = nk (45-4=41) is 2.60, so the $_{\text{calculated F value}}$ > F $_{\text{table}}$ or 14.023> 2.60 and a significant level 0.000 <0.05, then H0 is rejected, and H1 is accepted. That result meant that the variable characteristics (X1), competence (X2), and motivation (X3) together had a significant effect on the performance of field agricultural extension workers during the Covid-19 pandemic in Padang Pariaman Regency.

(c) Analysis of the Coefficient of Determination (R^2)

Table 12 Analysis test of the Coefficient of determination (R^2)

Model	*R*	*R Square*	*Adjusted R Square*	*std. An error in the Estimate*
1	0.712 [a]	0.506	0.470	2.09559

a. *Predictors: (Constant),* characteristics, competence, motivation
b. *Dependent*: instructor performance
Source: Primary data processed, 2021

Based on the analysis of the Coefficient of determination in the table, it is known that the value of the Coefficient of determination (R Square) table was 0.506. This result shows that there is a joint influence between the characteristic variables (X1), competency (X2), and motivation (X3) on the performance of field agricultural extension workers during the Covid-19 pandemic in Padang Pariaman Regency, namely 50.6 percent, the remaining 49. 4 percent is influenced by other variables that are not used in this research model such as the independence factor of extension workers, environmental characteristics factors

CONCLUSION

Based on the research that has been carried out, it can be concluded that the Characteristics of field agricultural extension workers in Padang Pariaman Regency are dominated by female extension workers, with a productive age range of 53-61 years. Most of them have Bachelor's degrees in agriculture, with work experience in the range of 12-16 years, with the number of assisted farmer groups 17-20, the total area the most extensive work area with a range of 62-73 km² is two people, while the respondents with the smallest work area in the range 3.03-14 Km² are 22.

Competence is a factor that significantly affects Field Agricultural Extension (PPL) performance during the Covid-19 period in Padang Pariaman Regency.

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