PERFORMANCE AGRICULTURAL EXTENSION IN ACEH BESAR DISTRICT, ACEH PROVINCE, INDONESIA

Mujiburrahmad, Cut Reva Ony Auliya,
Edy Marsudi, Akhmad Baihaqi, Ira Manyamsari

This study's objective is to ascertain how big the level of performance of agricultural instructors, and what are the factors that influence their performance. This research was conducted in Aceh Besar District. The number of samples is 28 people. The method used is descriptive qualitative method and multinomial logistic regression. The results showed that the level of performance of agricultural extension workers at a very perfect level was proven by several activities from the preparation of agricultural extension, extension workers who were in the medium category tended to be high in carrying out extension activities, evaluating and compiling reports on the results of extension activities. By using nine variables (x) in the simultaneous test, the value of the intercept only final variable sig value is 0.000, which means that the independent variable statistically significantly affects the dependent variable because the P-value <α(0.00 < 0.05). For the independent variables that affect the dependent variable, namely Xi1 Age, Xi4 Distance of residence, Xi5 Ownership of communication media, Xii1 Training, Xii2 Affordability of work area, Xii3 Availability of facilities and infrastructure, Xii4 Level of active participation of farmers. The seven independent variables have a significant influence on the independent variables.

Keywords: *performance; extension; agriculture*

Introduction

In agricultural extension efforts to assist people in increasing productivity in the agricultural sector, the role of agricultural extension workers as human resources is crucial. Extension is one form of service provided by the government to the community in this case are farmers [1]. Advice to farmers has long

been seen as an important factor in providing farmers with information and techniques that can improve their lives [2] and has been recognized as an important factor in agricultural development [3] . The importance of agricultural extension in agricultural development, especially in agrarian societies, has been widely recognized. Several studies have been conducted to look at the contribution of agricultural extension workers to increasing farmers' income, as well as the contribution of agricultural instructors in reducing poverty [4]–[10].

Extension can not only increase income but also facilitate the transfer of agricultural technology to farmers [11]. Agricultural extension workers have a role in promoting the adoption of new technologies and innovations [12]. Agricultural extension workers bring about change through education in the attitudes, knowledge and skills of farmers. Agricultural extension workers act as disseminators of information, build farmer capacity through the use of various communication methods and assist farmers in making the right decisions [13] However, in developing countries services for agricultural extension still face obstacles to building a well-managed and effective system [14]. Therefore, the government should try to implement several reforms to improve agricultural extension services. From several development policy research results, investment in extension services is considered to be potentially important for increasing agricultural productivity and increasing farmers' incomes [15], [16]. In Indonesia, agricultural extension workers have had a long history, the success of agriculture is highly dependent on extension workers because farmers and extension workers can interact directly with the delivery and implementation of programs to farmers.

Along with the times, problems in agriculture are increasingly complex. The problems faced today range from increasing the number and quality of production, marketing agricultural products, as well as access to information that continues to grow. Farmers are required to be able to adapt to the current situation and vice versa if farmers cannot adapt, they will not be able to develop themselves. High competence and performance are needed by agricultural extension workers to support the potential development of farmers. Although currently there are extension workers who have low competence. As a result of the low competency of the instructor, it will have an impact on the resulting performance. [17] Stated that in developing countries the performance of agricultural extension workers has not been able to transfer the latest technology to farmers and is still considered a failure and disappointment.

One of the reasons for the low competence of agricultural instructors is the lack of training obtained by extension workers. Due to the limited training opportunities provided for the extension workers, efforts are needed to improve

the performance of the extension workers. The government through Minister of Agriculture No. 61 of 2008 has encouraged extension workers to improve the performance of revitalizing agricultural extension. The revitalization of agricultural extension which is being pursued by the government is in the form of improving extension activities through education and training. In general, the performance of agricultural extension workers in Aceh Besar District is still disappointing. This condition is evidenced by the existence of extension workers who switch tasks to positions that are not in accordance with their competence as extension workers. This condition will lead to low performance of agricultural extension workers in carrying out their duties.

In order to achieve the main objective of the extension, it is necessary for extension workers with good performance, which is reflected in their high work productivity. Several research results [7], [11], [18]–[22] say "the ability of extension workers to realize Performance in carrying out all these tasks is influenced by many kinds of factors, both internal and external factors. The problem of the low level of competence and performance of agricultural instructors at this time needs to be solved. One way that can be done to overcome the problems mentioned above is by identifying and analyzing the factors that affect the performance of agricultural extension workers. The objectives of this study are: (1) To find out how big the level of performance of agricultural instructors is, and (2) To see the factors that affect the performance of the instructor.

Research method

This research was conducted at the Agricultural Extension Center (BPP) in Kuta Baro District and Blang Bintang District, Aceh Besar District. In this study, the sample consisted of all agricultural extension workers at BPP Kuta Baro and Blang Bintang, namely 28 people, consisting of several extension workers with different positions. Sampling technique using the census method. The census method is a sampling technique when all members of the population are used as samples. The types of data used in this research are primary data and secondary data. To find out how big the level of performance of agricultural instructors, the qualitative descriptive method is used. Descriptive analysis is used to analyze the description of the characteristics of the respondents. To find out the factors that influence the performance of agricultural extension workers in Aceh Besar District, several models are used, namely:

a. Goodness of Fit

This test is carried out by looking at the significance value of the regression results. Score the significance of a good Goodness of Fit is greater than 0.05

which means that the model is able to predict the value of the observation or it can be said that the model is acceptable because it matches the observation data [23]. The sample regression function's precision in guessing the real value is evaluated using the Goodness of Fit test, also known as the model feasibility test. In terms of statistics, the Goodness of Fit test may be performed by calculating the coefficient of determination, the F statistic, and the t statistic.

b. Coefficient of Pseudo Determination 2

Nagelkerke has a range of values from 0 to 1. The closer to 1, the more variation the model can explain.

c. Simultaneous Test (G Test)

According to [24], the significance test of the model (G test) was used to test the parameters simultaneously (simultaneously). The test is carried out by comparing the difference in the value of -2 log likelihood (which is called the chi-square count). The formula for the G test model:

$$G = -2In\left[\frac{L_o}{L_k}\right]$$

Information:

LO = maximum likelihood function without predictor variable

Lk = maximum likelihood function with predictor variable

The hypothesis used is:

- $H_0 = 0$, meaning that there is no significant effect between the independent variables simultaneously on the dependent variable.

- $H_a \neq 0$, meaning that there is a significant relationship between the independent variables simultaneously with the independent variables.

For hypothesis testing, the G test is carried out by comparing the G value with $\chi^2_{\alpha,db}$. The criteria for drawing conclusions for the significance test of the model (G test) with a 95% confidence level are as follows:

- If $G \geq \chi^2_{(p,\alpha)}$ or $p_{value} \leq \alpha$ then H_a is accepted and H_0 is rejected, meaning that each independent variable simultaneously affects the dependent variable.

- If $G \leq \chi^2_{(p,\alpha)}$ or $p_{value} > \alpha$ then H_a is rejected and H_0 is accepted, meaning that the independent variables together have no effect on the dependent variable.

d. Wald's test (partial)

Wald's test is a partial test that is used to test the presence or absence of the influence of the independent variable (X) on the dependent variable (Y). The test is carried out by comparing the difference between the wald value and the comparison value of chi square or by comparing the significance (p_{value}) with alpha.

The formula for the Wald test model is:

$$W = \left(\frac{\hat{\beta}_i}{SE(\hat{\beta}_i)} \right)^2$$

Information:

$\hat{\beta}_i$ = estimator for $\hat{\beta}_i$

$SE(\hat{\beta}_i)$ = standard error estimator for $\hat{\beta}_i$

The hypothesis used is:

- H_0: $ai=0$, meaning that the independent variable partially does not affect the dependent variable.

- H_a: $ai \neq 0$, meaning that the independent variable partially affects the dependent.

The criteria for drawing conclusions at the 95% confidence rate ($\alpha = 0.05$) are as follows:

- If $W > x^2_{tabel}$ or $p_{value} > \alpha$, then H_0 is rejected and H_a is accepted, meaning that there is an effect of the independent variable partially on the dependent variable.

If $W \leq x^2_{tabel}$ table or $p_{value} > \alpha$, then H_0 is accepted and H_a is rejected, meaning that there is no effect of the independent variable partially on the dependent variable

Results and discussion

Internal Characteristics of Extension

The data obtained during the research, one of which is the characteristics of the internal respondents who became the research sample and then tabulated in the table. The internal characteristics of the instructor consist of age, formal education, years of service, distance of residence, ownership of communication media. In detail, it is contained in Table 1. According to [1] age has an effect on a person's activeness to participate. The age referred to in this study is the length of life of an extension worker starting from birth until this research is carried out. The age characteristics in this study were categorized into four categories, starting from the age of 18 years to > 58 years. The results of this study showed that 79 percent of the instructor's age ranged from 29 to 43 years, and 21 percent of the instructor's age ranged from 44 to 58 years. The lowest age of the instructor is 29 years old, while the highest age of the respondent is 55 years, so the extension workers at the Kutabaro and Blang Bintang Agricultural Extension Center offices have a moderate age majority.

This shows that the extension workers in the two BPP offices are still quite productive in carrying out their duties as agricultural extension workers. In line with this, [3] stated that according to age, a person will accumulate experienc-

es which are very useful resources for his readiness to learn further. Age is a psychological factor that affects the learning process and learning efficiency directly or indirectly. The age of 25 is the optimal age for learning. At the age of 46 years, the ability to learn begins to decline and will decrease drastically at the age of 60 years. The level of formal education referred to in this study is the last formal education level of the extension worker who has been completed by obtaining a diploma until the research is carried out. The level of formal education is divided into four categories, namely: low is < high school, medium category is high school, high category with D3 level and is included in the very high category, namely Diploma 4/Strata 1. Out of 28 respondents 22 people have very high education, 5 extension workers are educated high and 2 respondents with moderate education.

According to [25], the higher a person's level of education, the higher the knowledge, attitudes and skills, work efficiently and the more people know better and more profitable ways and techniques of working. Formal education followed by the extension worker can affect the performance of the instructor, because with formal education an extension worker can improve his performance in accordance with his main duties and functions. The working period referred to in this study is the length of time the agricultural instructor respondents worked as agricultural extension workers. From the table above, it can be seen that as many as 86 percent of respondents have a long service period which is around 8-11 years with 24 respondents. While the other 14 percent worked very long hours, namely > 11 years with a total of 4 respondents.

The period of work or work experience is what is considered more capable in carrying out their duties. Working period is closely related to work experience. A person's experience determines the development of skills, abilities, and competencies. A person's experience increases with age [19]. Distance is a measure of how close one place is to another and is measured in kilometers. The distance of residence intended in this study is the distance from the respondent's house to the office of the agricultural extension worker. From the results of the study, it was found that 86 percent of respondents had a place to live that was included in the category very far from the office where they worked. From the interviews, it is known that most of the respondents live in lingke, ulee kareng, kajhu. Meanwhile, 11 percent of respondents are in the distant category, which is 3 km and another 4 percent live in the vicinity of the office where they work. From the results of the study, it is known that the communication media owned by extension workers are 82 percent who have 2-3 units while the remaining 18 percent only have <2 units or even only one, namely mobile phones.

Characteristics of Respondents

No.	Description	Frequency (People)	Percentage (%)
1	Age (Years) 18 - 28 29 - 43 44 - 58 > 58	0 22 6 0	0 79 21 0
2	Last education Middle School/Equivalent High School/Equivalent Diploma Bachelor	0 1 5 22	0 4 18 79
3	Working Period (Years) 0 - 3 4 - 7 8 - 11 > 11 Etc	0 0 24 4 -	0 0 86 14 -
4	Residential Distance (Km) < 1 1 3 > 3	0 1 3 24	0 4 11 86
5	Communication Media Ownership (Unit) < 2 2 – 3 3 – 5 > 5	5 23 0 0	18 82 0 0

Source: Field Survey, 2021

As for the results of the interviews I did, it was found that the communication media they have on average are only cellphones and laptops, where cellphones are used to access communication with farmer groups and personal needs while laptops are needed to make reports, RUK (Group Business Plans and so on).

Extension Characteristics

The respondent's characteristics data obtained during the research consisted of training, the affordability of the work area, the availability of facilities and infrastructure, as well as the level of farmer participation. Complete data on external characteristics of extension workers can be seen in Table 2.

The training referred to in this study is how much training the agricultural extension respondents participated in to increase their knowledge in one year. From the table above, it is known that only 14 percent attend training 4 times in 1 year, 7 percent attend training 3 times/year, 39 percent attend training 2 times/year and another 39 percent attend training only once per year.

The affordability of the work area in this study is the distance from the office extension worker with the location of the workplace. This distance is divided into four categories, namely: close with a score of 5 Km, moderate with a score of 6-10 Km, far with a score of 11-19 Km and very far with a score of 20 km. The results showed that of the 28 respondent extension workers, 64 percent of the extension workers were close to the location where the extension worker worked, 32 percent of the location where the extension worker worked was in the medium category, and the remaining 4 percent of the extension worker was very far from the work location. The results of interviews and field observations showed that all extension workers who became respondents used motorbikes as a means of transportation to go to BPP and visits to farmer groups. In an average the extension worker 4 times to visit his place of work. The average length of time for extension workers to go to work is 15 minutes.

The availability of facilities and infrastructure in question includes facilities such as computers, OHP, LCD, and other operational equipment as well as physical infrastructure such as BPP buildings and motorized vehicles needed by extension workers in carrying out their duties and functions which are only available 2 units for each sub-district BPP (used by the BPP coordinator extension sub-districts and senior extension officers in the sub-district BPP). The results showed that the level of compatibility between the number of facilities available and the needs of the extension workers, out of 28 respondents only 14 percent of the extension workers considered it adequate for facilities and infrastructure, 43 percent of the extension workers considered that the facilities and infrastructure were inadequate, and 14 percent of the extension workers assessed that the facilities and infrastructure were inadequate, especially for motorized vehicles.

From the results of the interview, it was found that there was the use of several personal facilities to facilitate the implementation of tasks as extension workers including cellphones, computers/laptops, stationery and motorcycles. Some extension workers have their own reasons for using personal facilities to facilitate the implementation of their duties as extension workers, including: (1) limited facilities provided by the office, and (2) for the smooth implementation of extension tasks. Extension facilities and infrastructure are tools needed to facilitate extension activities.

Table 2.

Characteristics of respondents based on training

No.	Description	Frequency (People)	Percentage (%)
1	Training (times/year)		
	1	11	39
	2	11	39
	3	2	7
	> 4	4	14
2	Work Area Affordability (Km)		
	< 5	18	64
	6 – 10	9	32
	– 19	1	4
	> 20	0	0
3	Availability of Facilities and Infrastructure	12	43
	Inadequate	12	43
	Inadequate	4	14
	Adequate	0	0
	Very Adequate		
4	Farmers' Active Participatory Level		
	Not active	0	0
	Less Active	10	36
	Active	18	64
	Very active	0	0

Source: Field Survey, 2021

Therefore, the successful implementation of extension needs to be supported by the existence of adequate facilities and infrastructure both in terms of quality and quantity. The level of farmer participation is in the very high category, namely 64 percent. [3], provides an understanding that the opportunities provided are often a driving factor for the growth of will, and will greatly determines its ability. The smarter the people's lives, the higher the participation of the community in development, and the counseling process is a real effort in realizing this intelligence. The form of community participation that is strongly felt as acknowledged by the extension worker is, especially the willingness of farmers to come when demonstrations are held by extension workers and for the stages of implementing program preparation.

Agricultural Extension Performance

A person's achievement in carrying out his work which is assessed on the basis of standards and criteria as well as sincerity, experience and skills that

have been set. The performance indicators in this study are based on the Regulation of the Minister of Agriculture Number: 91/Permentan/140/9/2013 Date: September 24, 2013 Guidelines for Evaluation of Agricultural Instructor Performance, and agricultural instructor performance assessment through the following indicators. 1) Preparation of Agricultural Extension, 2) Implementation of Agricultural Extension, 3) Evaluation and Reporting of Agricultural Extension. The results showed that out of 28 extension workers, 100 percent of the extension workers were very high in preparing for agricultural extension, thus the results revealed that the majority of respondent extension workers were in the very high category in preparing agricultural extension.

The performance level of agricultural extension workers at the level of preparation for agricultural extension is in the very high category, this is in line with the results of observations and interviews in the field which found that agricultural extension workers at BPP Kuta Baro and Blang Bintang in carrying out their duties as agricultural extension workers at the level of preparation for agricultural extension were very Perfectly proven some of the activities of the preparation of agricultural extension. Activities to generate data on regional and agro-ecosystem potentials, guide (accompaniment and assist) the preparation of the RDKK, develop village and sub-district agricultural extension programs, and make the Annual Work Plan for Agricultural Extension Officer. The respondent extension workers already understand the steps that must be taken and also understand the importance of involving community farmers in its implementation. The performance level of agricultural extension workers can be seen in table 3.

From the results of interviews and field observations of the activity of making regional and agro-ecosystem potential data, this is made annually, to be precise, in September each individual and collected in the form of reports or modules to be used as a guide for an extension worker. The results show that in practice the respondent extension workers often recompile and prepare the annual work plan for last year's proposal for the following year, without evaluating the program and without considering whether the program is right on target or not. The results of the research on the implementation of agricultural extension showed that as many as 50 percent of high-level extension workers in carrying out agricultural extension, 43 percent of respondent extension workers had a moderate frequency in implementing agricultural extension, and 7 percent of low-responder extension workers in carrying out agricultural extension, thus the results showed that extension workers are in the medium category, tend to be high in carrying out counseling agriculture.

Table 3.

Performance level of agricultural instructors at BPP Aceh Besar District

No.	Description	Frequency (People)	Percentage (%)
1	Agricultural Extension Preparation		
	Very low	0	0
	Low	0	0
	Currently	0	0
	Tall	0	0
	Very high	28	100
2	Implementation of Extension		
	Very low	0	0
	Low	2	7
	Currently	12	43
	Tall	14	50
	Very high	0	0
3	Availability of Facilities and Infrastructure		
	Inadequate	12	43
	Inadequate	12	43
	Adequate	4	14
	Very Adequate	0	0
4	Reporting Evaluation		
	Very low	0	0
	Low	1	4
	Currently	10	36
	Tall	10	36
	Very high	7	25

Source: Field Survey, 2021

The results of observations and interviews in the field found that there were activities in the implementation of agricultural extension that had been carried out well, not well, and had never been carried out. Several activities in the implementation of agricultural extension that have been well carried out by extension workers have an impact on the performance of the extension workers, namely: (1) distributing extension materials according to farmers' needs (2) implementing face-to-face extension methods to farmers and farmer groups, (3) implementing the method counseling in the form of demonstrations to farmers and farmer groups (4) increasing the capacity of farmers to access information in developing farming, and (5) growing farmer groups/gapoktan from the aspect of quality and quantity. Activities in the implementation of agricultural extension that are not good enough carried out by

respondent extension workers are: (1) carrying out field meetings/task meetings/technical meetings/work meetings/business meetings, (2) implementing agricultural extension methods in the target areas in the form of courses, (3) grow and develop farmer's economic institutions from the aspect of quantity and quality, (4) increase the class of farmer groups from the aspect of quantity and quality aspect.

The results of the research on evaluation and reporting showed that of the 28 respondent extension workers, 4 percent of the respondent instructors were low in preparing the evaluation and reporting, 36 percent of the respondent instructors had a moderate frequency in compiling evaluations and reporting, 36 percent were in the high category and the remaining 25 percent were very high. in preparing evaluation and reporting. The results of research in the field indicate that the majority of respondent extension workers are in the medium category in evaluating and compiling reports on the results of extension activities.

From the results of the interviews, it was found that the respondents conducted an annual evaluation at the end of December for each program that was run. However, it was also found that on average the instructors were lacking in carrying out several evaluation and reporting activities so that this would have an impact on the low performance of the instructors. From the results of interviews and observations, it is known that respondents only make monthly and annual reports that submit reports on extension activities to the head of the BPP or coordinator.

Factors Affecting Agricultural Extension Performance

In this study, the factors that affect the performance of agricultural instructors consist of age, formal education, years of service, distance of residence, ownership of communication media, training, affordability of the work area, availability of facilities and infrastructure.

a. Goodness of Fit

The significance value of a good Goodness of Fit is greater than 0.05. Seen in the table below, the Pearson value of the sig variable is 1.00, which means the model is fit (feasible to use) because *P-value* > α (1,00 > 0,05).

Tabel 4.

Goodness of Fit

	Chi-Square	df	Sig.
Pearson	.000	54	1.000
Deviance	.000	54	1.000

Source: Field Survey, 2021

b. Coefficient of Determination Pseudo 2

For the value of R^2, the closer to 1, the more variation the model can explain. The researcher measures the coefficient R2, which can be seen in the Nagelkerke value of 1,000, meaning that the diversity of the independent data variables in the study is able to explain the diversity of the variable data by 100 percent which can be explained by the model.

Table 5.

Pseudo R-Square

Cox and Snell	.891
Nagelkerke	1.000
McFadden	1.000

Source: Field Survey, 2021

c. Simultaneous Test (G Test)

The hypothesis used is:

- $H_0 = 0$, it means that there is no significant effect between the independent variables simultaneously on the dependent variable.

- $H_a \neq 0$, it means that there is a significant relationship between the independent variables simultaneously with the independent variables.

Based on the table above, the researcher tested the significance of the model, which can be seen in the intercept only final value of the sig variable, which is 0.000, which means reject H_0 and accept H_a, the independent variable statistically significantly affects the dependent variable because the P-value $< \alpha$ (0,00 < 0,05).

Table 6.

Model Fitting Information

Model	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only				
	62.025			
Final				
	.000			
		62.025	27	.000

Source: Field Survey, 2021

d. Wald's test (partial)

Used to test the presence or absence of the influence of the independent variable (X) on the dependent variable (Y) by comparing the significance (p_{value}) with alpha. The researcher conducted a partial test, which can be seen that the sig

value of the variable where the variable value is greater than α (0.05) means the independent variable has no effect on the dependent variable and vice versa if the sig value of the independent variable <0.05 then has an influence on the dependent variable.

It can be seen in the table that the independent variables that affect the dependent variable are $_{Xi1}$ Age (0.00), X_{i4} Jaraj of residence (0.000), X_{i5} Ownership of communication media (0.039), X_{ii1} Training (0.000), X_{ii2} Affordability of work area (0.015), X_{ii3} Availability of facilities and infrastructure (0.000), X_{ii4} Level of active participation of farmers (0.000). The seven independent variables that have been written down have a significant influence on the independent variables.

Table 7.

Likelihood Ratio Tests

Effect	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	.000ᵃ	.000	3	1.000
Xi1(Age)	21.096	21.096	3	.000
Xi2(Education f)	.000ᵃ	.000	3	1.000
Xi3(Term of Service)	.617ᵇ	.617	3	.893
Xi4(Dwelling Distance)	26.395	26.395	3	.000
Xi5(Communication Media Availability)	8.376ᵇ	8.376	3	.039
Xii1(Training)	22.533ᵇ	22.533	3	.000
Xii2(Workplace Affordability)	10.420ᵇ	10.420	3	.015
Xii3(Availability of Facilities & Infrastructure)	20.519	20.519	3	.000
Xii4(Farmers Participation Level)	25.388	25.388	3	.000

Source: Field Survey, 2021

e. Estimation Parameters

In the table above, it can be seen that the output parameter estimate is the output parameter, from which a model will be obtained regarding the decision of a person's performance level in the factors that influence it. To generate the model can be seen in the table below.

• The model for the category of very poor performance compared to the category of good performance (1/4)

$$g1(x) = \left[\frac{P(Y) = 1|x)}{P\,(Y) = 4|x)}\right] = 362.500 - 94.841_{X1.1} - 77.563_{X1.2} + 82.285_{X1.3} +$$

$$+ 116.448_{X1.4} + 501.287_{X1.5} + 88.682_{X2.1} + 2.548_{X2.2} + 359.645_{X2.3} + 356.081_{X2.4}$$

Where X1 = age, X2 = formal education, X3 = years of service, X4 = distance from residence, X5 = ownership of communication media, X6 = training, X7 = affordability of the work area, X8 = availability of facilities and infrastructure, and X9 = also level farmer participation. The tendency of respondents with the level of performance in the very poor category compared to the good category is 612,782 times greater, influenced by the affordability of the area where they work.

• Model for poor performance category compared to good performance category (2/4)

$$g1(x) = \left[\frac{P(Y) = 2|x)}{P\,(Y) = 4|x)}\right] = 2.575 - 63.888_{X1.1} + 43.284_{X1.2} + 45.065_{X1.3} +$$

$$+ 95.799_{X1.4} + 264.037_{X1.5} + 272.979_{X2.1} - 100.143_{X2.2} + 327.197_{X2.3} + 777.636_{X2.4}$$

Where X1 = age, X2 = formal education, X3 = years of service, X4 = distance from residence, X5 = ownership of communication media, X6 = training, X7 = affordability of the work area, X8 = availability of facilities and infrastructure, and X9 = also level farmer participation.

Table 8.

Estimation Parameters

Y^a	β	Std. Error	Wald	df	Sig.	Exp (β)	95% Confidence Interval for Exp	
							Lower Bound	Upper Bound
Intercept	362.500	5.518E5	.000	1	.999			
$X_{1.2}$	-94.841	1.211E4	.000	1	.994	6.474E-42	.000	.[b]
$X_{1.3}$	-77.563	2.564E4	.000	1	.998	2.065E-34	.000	.[b]
$X_{1.4}$	82.285	1.081E4	.000	1	.994	5.443E35	.000	.[b]
$X_{1.5}$	116.448	1.611E4	.000	1	.994	3.738E50	.000	.[b]
$X_{2.1}$	501.287	5.914E4	.000	1	.993	5.083E217	.000	.[b]
$X_{2.2}$	88.682	3.107E4	.000	1	.998	3.265E38	.000	.[b]
$X_{2.3}$	2.548	1.207E4	.000	1	1.000	12.782	.000	.[b]
$X_{2.4}$	359.645	5.594E4	.000	1	.995	1.556E156	.000	.[b]
	356.081	4.863E4	.000	1	.994	4.407E154	.000	.[b]
Intercept	-2.575E3	3.665E5	.000	1	.994			
$X_{1.2}$	-63.888	9847.366	.000	1	.995	1.794E-28	.000	.[b]
$X_{1.3}$	43.284	3.106E4	.000	1	.999	6.283E18	.000	.[b]

Y^a	β	Std. Error	Wald	df	Sig.	Exp (β)	95% Confidence Interval for Exp	
							Lower Bound	Upper Bound
$X_{1.4}$	45.065	8437.683	.000	1	.996	3.729E19	.000	[b]
$X_{1.5}$	95.799	1.110E4	.000	1	.993	4.029E41	.000	[b]
$X_{2.1}$	264.037	6.619E4	.000	1	.997	4.675E114	.000	[b]
$X_{2.2}$	272.979	2.302E4	.000	1	.991	3.574E118	.000	[b]
$X_{2.3}$	-100.143	1.516E4	.000	1	.995	3.226E-44	.000	[b]
$X_{2.4}$	327.197	3.083E4	.000	1	.992	1.259E142	.000	[b]
	777.636	3.228E4	.001	1	.981	[b]	.000	[b]
Intercept	1.420E3	6.036E5	.000	1	.998			
$X_{1.2}$	-85.027	9595.036	.000	1	.993	1.184E-37	.000	[b]
$X_{1.3}$	-179.477	4.182E4	.000	1	.997	1.133E-78	.000	[b]
$X_{1.4}$	63.959	1.517E4	.000	1	.997	5.984E27	.000	[b]
$X_{1.5}$	124.050	1.124E4	.000	1	.991	7.488E53	.000	[b]
$X_{2.1}$	347.181	6.832E4	.000	1	.996	6.006E150	.000	[b]
$X_{2.2}$	216.848	2.472E4	.000	1	.993	1.499E94	.000	[b]
$X_{2.3}$	-56.094	1.858E4	.000	1	.998	4.353E-25	.000	[b]
$X_{2.4}$	397.051	2.999E4	.000	1	.989	2.735E172	.000	[b]
	596.957	3.659E4	.000	1	.987	1.800E259	.000	[b]

Source: Field Survey, 2021

The tendency of respondents with the level of performance in the bad category compared to the good category is 6,283 times greater influenced by formal education.

• The model for the medium performance category is compared with the good performance category (3/4)

$$g1(x) = \left[\frac{P(Y=3|x)}{P(Y=4|x)}\right] = 1.420 - 85.027_{X1.1} - 179.477_{X1.2} + 63.959_{X1.3} +$$

$+ 124.050_{X1.4} + 347.181_{X1.5} + 216.848_{X2.1} - 56.094_{X2.2} + 397.051_{X2.3} + 596.957_{X2.4}$

Where X1 = age, X2 = formal education, X3 = years of service, X4 = distance from residence, X5 = ownership of communication media, X6 = training, X7 = affordability of the work area, X8 = availability of facilities and infrastructure, and X9 = also level farmer participation. The tendency of respondents with a performance level in the medium category compared to the good category is 7,488 times greater influenced by the distance of residence.

From the data above, it is known that the performance level of agricultural instructors is classified as very bad with a percentage of 3.6, a bad

category of 17.9, a moderate category of 53.6, and a good category of 25 percent. Which means that the medium category is the largest percentage among the very bad, not good, and good categories. However, the percentage of extension workers' performance that falls into the good category is only around 25 percent.

Table 9.

Classification

Classification

Observed	Predicted				
	stb	**tb**	**sdg**	**bk**	**Percent Correct**
stb	1	0	0	0	100.0%
tb	0	5	0	0	100.0%
sdg	0	0	15	0	100.0%
bk	0	0	0	7	100.0%
Overall Percentage	3.6%	17.9%	53.6%	25.0%	100.0%

Source: Field Survey, 2021

Conclusion and recommendation

The level of performance of agricultural extension workers at BPP Kuta Baro and Blang Bintang in carrying out their duties as agricultural extension workers at the level of preparation for agricultural extension was very perfect, as evidenced by several activities from the preparation of agricultural extension, and showed that the extension workers were in the medium category, tended to be high in carrying out agricultural extension as well as the majority of respondent extension workers are in the medium category in evaluating and compiling reports on the results of extension activities. By using nine variables (x) in the simultaneous test, the value of the intercept only final variable sig value is 0.000, which means that the independent variable statistically significantly affects the dependent variable because the P-value $< \alpha$ (0,00 < 0,05). For independent variables that affect the dependent variable, namely X_{i1} Age (0.00), X_{i4} Distance of residence (0.000), X_{i5} Ownership of communication media (0.039), X_{ii1} Training (0.000), X_{ii2} Affordability of work area (0.015), X_{ii3} Availability facilities and infrastructure (0.000), X_{ii4} The level of active participation of farmers (0.000). The seven independent variables that have been written down have a significant influence on the independent variables. The central and local governments need to spur the improvement of the performance of agricultural instructors through the implementation of training, with the following materials: (1) the ability to plan extensions, (2)

the ability to implement extensions, and (3) the ability to evaluate and report on extensions. The application of rewards and punishments to stimulate the work motivation of agricultural instructors so as to increase work productivity. It is equipped with adequate facilities and infrastructure as well as supporting funds for the optimal implementation of extension activities.

Conflict of interest. The author declares that there is no conflict of interest.

References

1. Ashraf S., Hassan Z., Ashraf I. Dynamics of agricultural extension services in Pakistan: A history of national performance. *The Journal of Animal and Plant Sciences*, 2019, vol. 29, no. 6, pp. 1707–1717.
2. Olorunfemi O.D., Oladele O.I. Knowledge of extension agents regarding professionalization of extension services: Evidence from south west Nigeria. *J. of Intl. Agric. and Ext. Edu*, 2018, vol. 25, no. 3, pp. 33–50.
3. Umar S., Man N., Nawi N. M., Latif I. A., Samah B. A. Core competency requirements among extension workers in peninsular Malaysia: Use of Borich's needs assessment model. *Eval Program Plann*, 2017, vol. 62, pp. 9–14. https://doi.org/10.1016/j.evalprogplan.2017.02.001
4. Mujiburrahmad M., Muljono P., Sadono D. Kinerja Penyuluh Pertanian di Kabupaten Pidie Provinsi Aceh dalam Melaksanakan Tugas dan Fungsi. *Jurnal Penyuluhan*, 2014, vol. 10, no. 2, pp. 141-150. https://doi.org/10.25015/penyuluhan.v10i2.9922
5. Norton G. W., Alwang J. Changes in agricultural extension and implications for farmer adoption of new practices. *Applied Economic Perspectives and Policy*, 2020, vol. 42, no. 1, pp. 8–20. https://doi.org/10.1002/aepp.13008
6. Leta G., Kelboro G., Stellmacher T., Hornidge A. K. "The agricultural extension system in Ethiopia: Operational setup, challenges," and opportunities. *ZEF working paper series*, 1864-6638, Center for …, 2017. https://www.econstor.eu/bitstream/10419/187464/1/zef-wp-158.pdf
7. Arshad F., Muhammad I., Shah N. A., Robina K. Agricultural extension agents and challenges for sustainable development (a case study of Peshawar valley). *Sarhad Journal of Agriculture*, 2010, vol. 26, no. 3, pp. 419–426.
8. Arnalte-Mur L. et al. The drivers of change for the contribution of small farms to regional food security in Europe. *Global Food Security*, 2020, vol. 26, 100395. https://doi.org/10.1016/j.gfs.2020.100395
9. Anwarudin O., Dayat D. The effect of farmer participation in agricultural extension on agribusiness sustainability in Bogor, Indonesia. *International Jour-

nal of Multicultural and Multireligious Understanding, 2019, vol. 6, no. 3, pp. 1061–1072. http://dx.doi.org/10.18415/ijmmu.v6i3.1028

10. Elias A., Nohmi M., Yasunobu K., Ishida A. "Farmers' satisfaction with agricultural extension service and its influencing factors: a case study in North West Ethiopia. *Journal of Agricultural Science and Technology*, 2016, vol. 18, no. 1, pp. 39–53. https://jast.modares.ac.ir/article-23-6455-en.pdf

11. Izuogu C. U., Onyeneke R. U., Njoku L. C., Azuamairo G. C., Atasie M. C. Repositioning Nigeria's agricultural extension system towards building climate change resilience. *Sarhad Journal of Agriculture*, 2021, vol. 37, no. 1, pp. 180–189. http://dx.doi.org/10.17582/journal.sja/2021/37.1.180.189

12. Temesgen D., Umer H., Jamal Y. Determinants of farm women participation in agricultural extension training programs: A case from selected district of Oromia Region of Ethiopia. *International Journal of Agricultural Science Research*, 2015, vol. 4, no. 4, pp. 67–77. http://academeresearchjournals.org/download.php?id=145266787381788453.pdf&type=application/pdf&op=1

13. Vihi S. K., Daudu S., Anonguku I. Assessment of Forestry Extension Service Delivery among Rural Farmers in Plateau State, Nigeria. *Asian Journal of Research in Agriculture and Forestry*, 2020, vol. 6, issue 1, pp. 12-24. https://doi.org/10.9734/ajraf/2020/v6i130095

14. Zikhali W. Impact of agricultural staff training and development on agricultural productivity: a case of Bubi district, Zimbabwe. *International Journal of Academic Research and Reflection*, 2017, vol. 5, no. 3, pp. 11–20. https://www.idpublications.org/wp-content/uploads/2017/04/Full-Paper-IMPACT-OF-AGRICULTURAL-STAFF-TRAINING-AND-DEVELOPMENT-ON-AGRICULTURAL-PRODUCTIVITY.pdf

15. Olorunfemi T. O., Olorunfemi O. D., Oladele O. I. Determinants of the involvement of extension agents in disseminating climate smart agricultural initiatives: Implication for scaling up. *Journal of the Saudi Society of Agricultural Sciences*, 2020, vol. 19, no. 4, pp. 285–292. https://doi.org/10.1016/j.jssas.2019.03.003

16. Abdullahi A., Girei A. A., Usman I. S., Abubakar M. G. Assessment of Adaptation Strategies for Deforestation and Climate Change: Implication for Agricultural Extension System in Nigeria. *International Journal of Innovative Agriculture & Biology Research*, 2017, vol. 5, no. 2, pp. 11–17. https://seahipaj.org/journals-ci/june-2017/IJIABR/full/IJIABR-J-3-2017.pdf

17. Afful D. B. Public extension agents' need for new competencies: Evidence from a climate variability study in Limpopo Province, South Africa. *South African Journal of Agricultural Extension*, 2016, vol. 44, no. 2, pp. 59–70. http://www.scielo.org.za/scielo.php?script=sci_arttext&pid=S0301-603X2016000200006

18. Mirani Z., Memon A. Farmers' assessment of the farm advisory services of public and private agricultural extension in Hyderabad district, Sindh. *Pakistan Journal of Agricultural Research*, 2011, vol. 24(1-4), pp. 56-64. https://www.cabi.org/GARA/FullTextPDF/2013/20133374603.pdf

19. Kansiime M. K., Alawy A., Allen C., Subharwal M., Jadhav A., Parr M. Effectiveness of mobile agri-advisory service extension model: Evidence from Direct2Farm program in India. *World Dev Perspect*, 2019, vol. 13, pp. 25–33. http://dx.doi.org/10.1016/j.wdp.2019.02.007

20. Danso-Abbeam G., Ehiakpor D. S., Aidoo R. Agricultural extension and its effects on farm productivity and income: insight from Northern Ghana. *Agriculture & Food Security*, 2018, vol. 7, no. 1, pp. 1–10. https://doi.org/10.1186/s40066-018-0225-x

21. Davis K. How will extension contribute to the sustainable development goals? A global strategy and operational plan. *Journal of International Agricultural and Extension Education*, 2016, vol. 23, no. 1, pp. 1–7.

22. Narayana S. C., Mahmud M. A., Babu P. S. The impact on training of farmers training centers on farmer's productivity: the case of Dire Teyara and Sofi Woredas-Harari Region-Ethiopia. *International Journal of Agriculture Innovations and Research*, 2015, vol. 3, no. 5, pp. 1405–1410. https://ijair.org/administrator/components/com_jresearch/files/publications/IJAIR_1278_Final.pdf

23. Ghozali I. Multivariate analysis application with SPSS program. Semarang: Diponegoro University Publishing Agency, 2011.

24. Menard S. Applied logistic regression analysis. Vol. 106. Sage, 2002. https://dx.doi.org/10.4135/9781412983433

25. Baloch M. A., Thapa G. B. The effect of agricultural extension services: Date farmers' case in Balochistan, Pakistan. *Journal of the Saudi Society of Agricultural sciences*, 2018, vol. 17, no. 3, pp. 282–289. https://doi.org/10.1016/j.jssas.2016.05.007

DATA ABOUT THE AUTHORS
Mujiburrahmad
Syiah Kuala University
Banda Aceh City, Aceh Province, 23111, Indonesia
mujiburrahmad@unsyiah.ac.id

Cut Reva Ony Auliya
Syiah Kuala University
Banda Aceh City, Aceh Province, 23111, Indonesia

Edy Marsudi

> *Syiah Kuala University*
> *Banda Aceh City, Aceh Province, 23111, Indonesia*

Akhmad Baihaqi

> *Syiah Kuala University*
> *Banda Aceh City, Aceh Province, 23111, Indonesia*

Ira Manyamsari

> *Syiah Kuala University*
> *Banda Aceh City, Aceh Province, 23111, Indonesia*