The influencing factors on the performance of agricultural extension agents in corn farming (a study conducted in Gorontalo province)

by Mohamad Ikbal Bahua

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Y T Walangadi[1], M I Bahua[2], M A Arham[2] and M H Jamil[3]

[1]Student of Post Graduate Program, Study Program of Agribusiness, State University of Gorontalo
[2]Lecturers of Post Graduate Program, Study Program of Agribusiness, State University of Gorontalo
[3]Agribusiness Study Program, Department of Social Economic of Agriculture, Faculty of Agriculture, Hasanuddin University

Email: yuritawalangadi@gmail.com

Abstract. Performance is the response or success of the work actually achieved by individuals in an organization. Agricultural extension workers have basic tasks and functions that must be carried out to achieve good performance. The instructor who performs well can position himself as a motivator, educator, facilitator and dynamicator that has an impact on changes in farmer's behavior in farming. The specific goal of this study is to 1) identify the internal factors influencing the performance of agricultural extension agents in corn farming in Gorontalo Province and 2) analyze the extent to which the internal factors influence the performance of agricultural extension agents in corn farming in Gorontalo Province. This study employed a survey method and involved 123 extension agents as the sample. The data were analyzed using the multiple linear regression analysis. The results show that variables of agricultural extension agents' characteristics, work ability, and motivation are the internal factors that partially and simultaneously provide a significant effect on the performance of agricultural extension agents in Gorontalo Province. The extent to which internal factors influence the performance mentioned above is 52.7%.

Introduction

Performance is the result of work achieved by individuals in carrying out duties and functions as in line with the responsibility given to them according to their ability. Performance is an achievement of organizational or individual vision, mission, and goal that is actualized through strategy planning, workload, and job description undertaken effectively and efficiently based on a particular period.

Agricultural extension agents play a role in empowering farmers as the main actor of agribusiness, so that they will be able to develop farming with their own local resources. The extension implemented to the farmers lead them to become the subject of agricultural development program implementation since they act as a manager who looks after the farming with their own ability and local potentials around them.

The implementation of an agricultural extension will run effectively as expected if the extension agents as the field facilitator have a vision and mission according to the interests of the farmers and their farming. Agricultural extension agents on the principle of their duties and functions must work with farmers instead of working for them. This principle will make the extension agents position themselves as the motivator, facilitator, and empowerer who will plan the farming process along with the farmers according to the farmers' ability and local potentials around the area.

Agricultural extension in Gorontalo Province has not run well since the extension agents manage two or more villages as their working area with unsupportive distance, facilities, infrastructure, self-doubting, and the lack of knowledge of the extension agents to give extension materials or technological information to farmers, different education levels and study fields.

Information technology has disseminated to every person's life, including the farmers'. It demands extension institutions in Gorontalo Province to make a change and adjustment to the extension implementation, technology and information system development along with extension agents' improvement to respond to all issues accurately and proportionally.

Extension as a non-formal educational institution focusing on the better behavior changes of the farmers and their families has challenges in performing its functions and roles [1]. The agricultural extension agents who will act upon their roles and functions should be able to convince the farmers and their families as the main clients. Based on the aforementioned issues, the performance of agricultural extension agents is essential to help farmers and their families solve farming problems. Farmers' competence and participation in the agricultural extension are the efforts and performance contribution of the agricultural extension agents in implementing the extension program planning. Hence, central and local governments' role through the policy of the improvement of extension budget and facilities by paying attention to the extension agents' characteristics, competence, motivation, and independence is able to enhance the extension agents' performance that will be impactful on the corn farmers' better behavior changes in managing their farming.

Apart from the above problems, agricultural extension agents are still very much needed as the spearhead of agricultural development in Gorontalo Province. The data from agricultural extension information system of the Ministry of Agriculture in 2018 reveal that there are 586 Agricultural Extension Agents, consisting of 395 government employees, 37 government employee candidates, and 154 non-permanent staffs of the State Budget or Regional Revenue and Expenditure Budget. They all should improve their performance or even work achievement regarding supervising farming activities that contribute to the increased income and welfare of the farmers in Gorontalo Province.

Therefore, a study on "Influencing Factors to the Performance of Agricultural Extension Agents in Corn Farming in Gorontalo Province" was conducted to obtain information about the success of agricultural extension agents' performance in helping farmers manage their corn farming. Such a topic is essential because a good performance achieved by the extension agents can lead the farmers to a better understanding of agricultural technological information as in line with the problems they face.

On that ground, this research is intended to 1) identify the internal factors influencing the performance of agricultural extension agents in corn farming in Gorontalo Province and 2) analyze the extent to which the internal factors influence the performance of agricultural extension agents in corn farming in Gorontalo Province.

2. Methods

This study was conducted from June to August 2018 in Gorontalo Province that consisted of Gorontalo Regency, Bone Bone Bolango Regency, Boalemo Regency, Pohuwato Regency, Gorontalo Utara Regency, and Gorontalo City. The data comprise the factors influencing the performance of agricultural extension agents that cover variable (X) as the independent variable and variable (Y) as the dependent variable. The collected data consisted of primary and secondary data in which the primary ones were collected from questionnaires. The data were categorized as interval data, i.e., type of data that is tiered with the same distance according to the degree or intensity of each variable indicator according to its operational definition.

2.1. Population and sample

The smallest observation unit in this study was agricultural extension agents around Regencies/City; Sub-district-level Agricultural, Fishery, and Forestry Extension Institute (henceforth called as BP3K). The agricultural extension agents at BPTK work in several villages/urban villages as their working area. As many as 586 agricultural extension agents in Gorontalo Province mostly work as government's employees, and they are assumed to have the same main duties and roles. Further, the analysis unit of this study was the agricultural extension agents. The sample was selected by employing the proportional random sampling technique from the list of extension agents' names in the site area. By using the Slovin's formula [2], the sample size of agricultural extension agents with the error level 8% was 123 people.

2.2. Data analysis

2.2.1 Multiple linear regression analysis. Multiple linear regression analysis was employed to determine the empirical model of the causality relationship between variables and their supporting factors. Multiple linear regression analysis is a linear correlation between two or more independent variables $(X_1, X_2, ... X_n)$ and the dependent variable (Y), to find out whether or not the independent and dependent variables are correlated positively or negatively as well as to predict the value of the dependent variable if the value of independent variable increases or decreases. The data used were usually in an interval or ratio scale. Below is the multiple linear regression analysis formula:

$$Y = a + b_1 X_1 + b_2 X_2 + b_3 X_3 + e \tag{1}$$

Information:
Y	=	Agricultural extension agents' performance
X_1	=	Agricultural extension agents' characteristics
X_2	=	Agricultural extension agents' work ability
X_3	=	Agricultural extension agents' motivation
a	=	Intercept or constant
$b_1 b_2 b_3$	=	Regression coefficient from $X_1 X_2 X_3$
E	=	Disturbing Factor

3. Results and discussion

3.1. Influencing factors to the performance of agricultural extension agents

The influence of internal factors towards the agricultural extension agents' performance was analyzed using the multiple linear regression analysis. Below are the results of the study on the influence of internal factors on the performance of agricultural extension agents:

3.1.1. Determination coefficient (R^2) test. R^2 test was employed to discover the extent to which the independent variables influence the dependent variable, i.e., the extent to which agricultural extension agents' characteristics, work ability, and motivation affect their performance in Gorontalo Province. The value of Determination Coefficient was taken from the *R Square*. The following are the results of the determination coefficient test of the variables in this study:

Table 1. Results of determination coefficient (R^2) test model Summary[b].

Model	R	R Square	Adjusted R square	Std. Error of the estimate	Change statistics				
					R Square change	F Change	df1	df2	Sig. F Change
1	.726[a]	.527	.515	.49773	.527	44.194	3	119	.000

Source: Primary Data after Processed, 2018

The above table shows that the value of determination coefficient of *R Square* is 0.527, meaning that 52.7% of the Agricultural Extension Agents' Performance can be explained by their characteristics, work ability, and motivation in Gorontalo Province; meanwhile, 47.3% is explained by other factors excluded in the model. The internal factors towards the performance of agricultural extension agents are affected by the extension agents' characteristics that is able to develop the materials, media, and methods of extension by utilizing agricultural technological information in their working area, and work ability in which they can use local resources potentials and implement the extension program to farmer groups. This is supported by motivations of work achievement and power of the agricultural extension agents, so that the cooperation with the farmers can be created, following the goals of the extension program.

3.1.2. Simultaneous testing (F Test) Simultaneous test (F Test) is between the independent variables of extension agents' characteristics (X1), extension agents' work ability (X2), extension agents' Motivation (X3); and Agricultural Extension Agents' Performance (Y). The simultaneous analysis results assisted by version-22 SPSS program are presented below:

Table 2. Simultaneous test (F-Test).

ANOVA[b]					
Model	Sum of squares	df	Mean square	F	Sig.
Regression	32.845	3	10.948	44.194	.000[a]
Residual	29.480	119	.248		
Total	62.326	122			

Source: Primary Data after Processed, 2018

The analysis results in Table 2 indicates that the value of F_{count} is 44.194 with the $P_{Value} = 0.000$. Thus, based on the criteria, the variables of extension agents' characteristics (X1), extension agents' work ability (X2), and extension agents' Motivation (X3) do significantly and simultaneously influence the Agricultural Extension Agents' Performance in Gorontalo Province.

Internal factors of the extension agents provide a simultaneous effect on their performance in improving corn farming in the site area with the value of *F-count* = 44.194 and p-value (0.000). This elaborates that the variables of extension agents' characteristics, work ability, and motivation do simultaneously affect the agricultural extension agents' performance.

3.1.3. Partial testing (t-Test). Below are the results of partial influence testing:

Table 3. Partial test results (t-Test).

Variable	Regression coefficient	t count	P-Value	Description
Constant	0.107	0.131	0.896	
Extension Agents' Characteristics	-0.272	-4.214	0.000*	Significant
Extension Agents' Work Ability	0.969	10.821	0.000*	Significant
Extension Agents' Motivation	0.229	3.354	0.001*	Significant

Source: Primary Data after Processed, 2018

Based on the analysis results using the assistance of SPSS 22 program, the model of multiple linear regression equation is as follows:

$$Y = 0.107 - 0.272 X_1 + 0.969 X_2 + 0.229 X_3 \qquad (2)$$

Description
0.107 = Constant Value
X_1 = Extension Agents' Characteristics
X_2 = Extension Agents' Work Ability
X_3 = Extension Agents' Motivation

Here is the data processing:
a. Extension agents' characteristics (X_1)
The value of regression coefficient for extension agents' characteristics variable b_1 is -0.272, indicating that if one unit of extension agents' characteristics increases, the performance of the extension agents will be decreased by 0.272 units with other factors considered constant (*cateris paribus*). The value of t_{count} for extension agents' characteristics ($X1$) is $t_1 = (-4.214)$. This value is significant in the level of 0.05 or $P = 0,000$, implying that extension agents' characteristics (X_1) do partially influence the performance of extension agents (Y) in Gorontalo Province.

This result brings out the fact that the variable of extension agents' characteristics affects the decline in their performance that most of the agricultural extension agents (36.6%) are 40-45 years old and 26.8% of them are 46-51 years old. The older the extension agents are, the more surfeited and the less responsive the farmers towards problems will be. Further, 34.1% of the extension agents get Diploma 4 Degree, and 28.5% get the Bachelor's Degree in which extension agents with such education levels do not longer focus on giving agricultural extension since they more concern with an administrative position. In terms of training participated by the extension agents, nearly all of them participate in functional training (44.7%); only 30% join technical training. At the same time, technical aspects are required for performance evaluation, so that it needs the knowledge and skills of the extension agents in planning and implementing an extension program that has been developed together with the farmers.   Besides, working area and its coverage, number of guided farmers, and interaction with guided farmers greatly influence the decrease in agricultural extension agents' performance by which most of them (41.6%) have 238 - 412 guided farmers who are members of the 12-20 farmer groups with 3-4 villages working area. Ideally, an extension agent only guides one village with a maximum of eight farmer groups or 150 to 200 guided farmers that this can also cause a lack of interaction with farmers.

The results of this study are in line with Bahua (2010), confirming that extension agents' physical and non-physical characters determine the working potency and time that are integrated into the evaluation of individuals' performance of an organization [3].

b. Extension agents' work ability (X_2)
The value of regression coefficient for extension agents' work ability variable is in a positive sign $b_1 = 0.969$, signifying that if one unit of extension agents' work ability increases, the performance of the extension agents will be improved by 0.969 units with other factors considered constant (*cateris paribus*). The positive regression coefficient of extension agents' work ability shows that it is in a rational part. The value of t_{count} of extension agents' work ability is $t_1 = 10.821$. This value is significant in the level of 0.05 or $P = 0,000$, meaning that extension agents' work ability (X_1) does partially and positively influence the performance of extension agents' (Y) in Gorontalo Province.

The results reveal that the variable of agricultural extension agents' work ability includes the dimensions of the number of abilities to utilize agricultural technology and local resources, to plan and implement extension programs, to develop interpersonal relationship, to manage extension information, to appreciate cultural diversity, farming technical ability, and leadership ability that give

an effect on improving the performance of agricultural extension agents towards the availability of extension materials, media, and methods in improving corn farming in Gorontalo Province.

This result complies with Inten *et al.* (2017), explaining that work ability is a manifestation of extension agents' competencies that determine the performance evaluation of agricultural extension agents based on their characteristics, motivation, and independence. Tjitropranoto (2005) states that an extension agent's work ability is established by physical and non-physical characters, intrinsic and extrinsic motivations, intellectual independence, and emotional independence that underlies an individual in deciding to carry out his work responsibility [4]. Work ability is included in the competence factor that affects the work and creation potencies of agricultural extension agents in planning extension programs.

c. Extension agents' motivation (X_3)

The value of regression coefficient for extension agents' motivation variable is in a positive sign $b_1 = 0.229$, implying that if one unit of extension agents' motivation increases, the performance of the extension agents will be improved by 0.229 units with other factors considered constant (*cateris ribus*).   The value of t_{count} for extension agents' motivation is $t_1 = 3.354$. This value is significant in the level of 0.05 or $P = 0,001$, indicating that extension agents' work ability through the dimension of motivation to have a good achievement, to affiliate, to dominate, and to be acknowledged does partially and positively affect the performance of extension agents in Gorontalo Province. This is shown by an appreciation given to the best extension agent, cooperation between extension agents and farmers as well as increased agricultural production, particularly corn production.

This result is in accordance with Rutinsyah (2015) that intrinsic and extrinsic motivations realize extension agents' motivation in increasing agricultural production, and supported by physiological motivation in the form of the needs of farmers' self-actualization and acknowledgment [5]. An individual's self-motivation does not guarantee his work success since the role of each in an organization is different from each other. Work surfeit will drive people not to be motivated in working, so that an appreciation for a successful work will help them motivate themselves to do their work according to their responsibilities [6].

4. Conclusion

This study concludes that variables of agricultural extension agents' characteristics, work ability and motivation are the internal factors that partially and simultaneously provide a significant effect on the performance of agricultural extension agents in Gorontalo Province. The extent to which internal factors influence the performance mentioned above is 52.7%.

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