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Enhancing Extension Worker Performance in Southeast Sulawesi: A New Institutional Model for Agricultural Extension in Indonesia

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This research examines the institutional model of agricultural extension in improving the performance of agricultural extension workers in Southeast Sulawesi Province. The research was conducted in Konawe Regency and South Konawe Regency of Southeast Sulawesi Province which took place from June 2021 to December 2022. The population in this study were agricultural extension workers in Konawe Regency and South Konawe Regency totaling 183 personnel divided into 28 Agricultural Extension Centers. This study included exogenous variables in the form of organizational characteristics, extension agent independence, and extension agent competence, while endogenous variables were institutional effectiveness and agricultural extension agent performance. Data were analyzed using SEM (Structural Equation Model) PLS (Partial Least Square) or SEM-PLS method. The research findings show that the variables of organizational characteristics, extension agent independence and extension agent competence have a positive and significant effect on the effectiveness of extension institutions. The effectiveness of agricultural extension institutions has a positive and significant effect on the performance of agricultural extension workers in Southeast Sulawesi Province.

Keywords: Extension Institutions, Characteristics, Independence, Competence, and Institutional effectiveness.

INTRODUCTION

The implementation of agricultural development in Indonesia essentially places farmers as the main actors. Other agricultural human resources act as facilitators. The role carried by farmers in relation to agricultural development in the foundation for contributing to reducing poverty, malnutrition, and maintaining ecological and environmental balance (Djufri *et al.*, 2019). This condition is further exacerbated by the emergence of world food and global agriculture issues that require farmers to constantly improve their professionalism and mastery of science and technology. Realizing that the current condition of Indonesian people's agriculture is still at an earlier stage, even many farmers are still implementing subsistence farming systems. Thus, policy transformation efforts are needed to prepare effective steps that are transitional towards future agriculture. For Indonesian agriculture, the transformation process aims to encourage farming communities to be oriented towards three dimensions, namely efforts that reflect economic, ecological and social resilience (Pasandaran, 2020).

The implementation of the transformation process can only be fulfilled if farmers constantly make changes in accordance with the demands of the times. Such changes can only be made if farmers are willing to learn. Learning activities for farmers are facilitated by agricultural extension workers through extension activities. Extension activities require a certain form of organization. This is because extension activities involve many parties, have common goals, and require certain functions, both policy makers, planning, implementation, evaluation and development (Mukhlis, 2020). So, the need for action in strengthening the organization / institution of extension that provides many benefits to the smooth implementation of extension as well as can improve the performance of the agricultural extension system.

The agricultural extension institution referred to in this study is a government institution that has a function as a

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guarantor of the implementation of agricultural extension activities in its working area and is at the lowest level of structure. This institution plays an important role in agricultural development as a forum for field agricultural extension workers, guarantors of the implementation of agricultural extension activities, and is in direct contact with farmers. This condition reinforces the importance of agricultural extension institutions in realizing the success of agricultural development. This is in line with the opinion of Lesmana (2007) which states that the extension institution is a determinant factor that greatly affects the improvement of the quality of agricultural human resources and the achievement of agricultural development goals.

In Indonesia, agricultural extension institutions have experienced a long dynamic journey. Starting from the colonial era, Independence, reform, regional autonomy, until now. It has always been characterized by changes in both structure and nomenclature. Every change in institutional structure results in changes to the governance system and performance of extension workers.

During the period of regional autonomy (since the enactment of Law No. 22 of 1999), the condition of agricultural extension continued to degredate. The development program of agricultural extension found many problems, especially related to institutions. This arises because the function of agricultural extension at the provincial level has not run optimally, the mandate for the implementation of agricultural extension is not clear, the main tasks, functions and echelon of agricultural extension institutions in the districts vary, not all districts have adequate BPP, and the existing BPP has not functioned optimally. Many BPPs have switched functions and some still do not have facilities and infrastructure for extension activities (Sucihatiningsih and Waridin, 2015).

Government Regulation No. 41/2007 on Regional Institutions has created different perceptions of extension institutions in each region. Different perceptions of these public policies have changed the structure of agricultural extension institutions and their operations in the regions. This condition has caused the performance of agricultural extension to decline, because the implementation of extension is placed in an inappropriate position (Rusmono, 2021). Even entering the 21st century, the performance of agricultural extension can be said to have reached its lowest point. In this period of regional autonomy, agricultural extension is considered a less important activity so that many are liquidated (Amanah, 2006). The role of agricultural extension in supporting agricultural development programs has decreased dramatically (Prianto *et al.*, 2012).

Actually, the birth of Law No. 16 of 2006, concerning SP3K (Agricultural, Fisheries and Forestry Extension System), supported by Presidential Regulation No. 154 of 2014 concerning KP3K (Agricultural, Fisheries and Forestry Extension Institutions), is a more appropriate solution in overcoming the problems of agricultural extension institutions so far that have led to the degredation of functions and decreased roles. The essence of these two legal products is the need to establish agricultural extension institutions starting at the central level, provincial level, district / city to sub-district level. In addition, it contains new spirit values that extension is no longer just a process of transferring technology, but rather the realization of farmer independence through institutional and organizational arrangements (Sadono, 2019; Setiawan, 2005). Both legal products are strong legal standing to be able to guarantee the implementation of extension activities while developing the mission of agricultural extension which is always updated according to the times.

The latest condition (at the time of this research) is that agricultural extension institutions at the provincial and district levels are integrated with the offices that organize extension services. Agricultural extension officers are under the agriculture office, livestock extension officers are under the livestock office, forestry extension officers are drawn to the province, and fisheries extension officers are drawn to the center. This condition is also a cause for concern given the potential difficulty in coordinating extension workers with different fields of expertise. Meanwhile, farmers generally carry out agricultural activities in a "poly-palent" manner that requires technological support for different types of commodities.

Based on the history of the dynamics of agricultural extension institutions as described above, since the period of regional autonomy until now agricultural extension institutions have not receded from the downturn. The lack of funding allocation from the Regional Government has resulted in important activities in BPP such as farmer training only being carried out as it is, even the activities of reviewing applied technology, demfarms, demonstration plots, technology titles, field schools, which are aimed at increasing farmer competence and transferring technology almost no longer exist. Weak support for facilities and infrastructure, lack of human resources for extension workers, and low intensity of training for extension workers are common phenomena, especially in regions with relatively low local revenue (PAD), including Southeast Sulawesi Province.

MATERIALS AND METHODS

The research has been conducted from June 2021 to December 2022 located in Konawe Regency and South Konawe Regency of Southeast Sulawesi Province. The research location was determined purposively with the basis for determining the location, that the two districts are rice commodity development areas and are known as rice granaries in Southeast Sulawesi. The research location is quite strategic, located on the mainland of Sulawesi island, and relatively close to the provincial capital. Thus this area has a

great opportunity to be developed into a rice agribusiness center.

This research was designed using quantitative research methods aimed at knowing the relationship of exogenous variables (X) with endogenous variables (Y1), and the relationship of endogenous exogenous variables (Y1) with endogenous variables (Y2) and to produce a theoretical model of agricultural extension institutions that can improve the performance of extension workers.

The population in this study were agricultural extension workers in Konawe Regency and South Konawe Regency in the working area of the Agricultural Extension Center (BPP) who developed rice commodities in their working area. The number of BPPs in the two districts is 50 units, while the number of extension workers is 241 personnel in the two districts (Konawe and South Konawe). Determination of informant samples in this case agricultural extension workers conducted by census from 28 selected BPPs. With a total sample size of 183 extension personnel.

In this study there are five variables studied, including two dependent variables, namely the effectiveness of agricultural extension institutions (Y1), and the performance of agricultural extension (Y2). While three independent variables, namely: (1) Organizational characteristics (X1); (2) Extension independence (X5) and (3) Extension competence (X6).

The data will be analyzed by vit-model testing through SEM (Structural Equation Modeling) - PLS (Partial Least Square) using the SmartPLS version 3.0 application that will produce a statistical model of the theoretical model of agricultural extension institutions in improving the performance of extension workers in Southeast Sulawesi Province. Sarstedt *et al.* (2021) state that PLS-SEM analysis is primarily used for theory development or building, with a focus on prediction. It is employed to determine the relationship between latent variables, serving a predictive function. Furthermore, this statistical model will be integrated with future model predictions about the existence of extension institutions, so that the statistical model (initial findings) becomes an applied system model that accommodates current and future development opportunities.

PLS-SEM analysis consists of two sub-models: measurement model (outer model) and structural model (inner model). As explained by Sadidi *et al.* (2018) the measurement model or outer model, describes the relationship between each indicator block and its latent variable. Assessment of the measurement model involves confirmatory factor analysis, testing convergent and discriminant validity. Reliability is evaluated through two methods, namely Cronbach's Alpha and Composite Reliability. Benitez *et al.* (2020) state that the evaluation of the structural model or inner model, aims to predict the relationship between latent variables. The inner model describes the strength of the relationship or estimation between latent variables or constructs based on substantive theory. The inner model analysis in this study includes testing the Path Coefficient, R-Square (R^2), Goodness of Fit (GoF), Q-Square (Q^2), and hypothesis testing.

RESULTS AND DISCUSSION

***Agricultural Extension Institutional Model in Improving Extension Worker Performance*:** The institution of agricultural extension in this case is the Agricultural Extension Center (BPP) is an entity located at the sub-district level and is occupied by field agricultural extension workers in carrying out extension activities that are directly related to farmers. BPP is a legally formal organization established by the government specifically responsible for the implementation of agricultural extension in the region (WKBPP). Effective agricultural extension institutions will certainly affect the performance of extension workers in carrying out their duties and responsibilities. Therefore, an effective model of extension institutions is needed to improve the performance of extension workers.

In this study, the PLS structural model analysis was carried out with the help of SmartPLS 3.0 software. Data analysis using Partial Least Squares Structural Equation Modeling (PLS-SEM), which is a technique used to refine or predict existing theories (Garson, 2016). Structural model analysis includes several stages: (1) formulation of structural model theory, (2) measurement model testing, (3) structural model testing, and (4) hypothesis testing (Hair *et al.*, 2014).

***Structural Model Theory Formulation*:** The structural model formulated in this study includes exogenous and endogenous variables. Exogenous variables are: (1) Organizational Characteristics (X1) consists of 5 indicators, including: resources (X1.1), leadership (X1.2), rewards (X1.3), work programs (X1.4), and organizational structure (X1.5). (2) Extension worker independence (X2) consists of 4 indicators, including: economic independence (X2.1), intellectual independence (X2.2), emotional independence (X2.3), and social independence (X2.4). (3) Extension competence (X3) consists of 10 indicators, including: the ability to plan extension (X3.1), the ability to implement extension (X3.2), the ability to evaluate and report extension (X3.3), the ability to develop agricultural extension (X3.4), ability to develop the agricultural extension profession (X3.5), agricultural extension leadership skills (X3.6), technology dissemination skills (X3.7), communication skills (X3.8), business partnership skills (X3.9), and rice production technology skills (X3.10). Endogenous variables are (1) institutional effectiveness (Y1) which consists of 4 (four) indicators, including: resources (Y1.1), leadership (Y1.2), goal achievement (Y1.3), and policy (Y1.4). (2) Extension performance (Y2) consists of 7 (seven) indicators, including: the preparation of extension programs (Y2.1), the implementation of extension programs (Y2.2), the implementation of extension program evaluation (Y2.3),

extension development (Y2.4), extension professional development (Y2.5), the implementation of technology dissemination (Y2.6), and the implementation of technical assistance in rice cultivation (Y2.7). The following is a picture of the formulation of the research structure model.

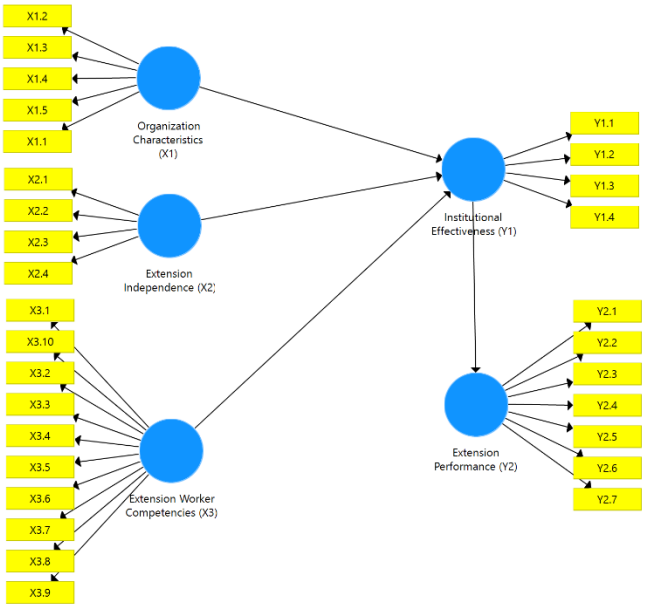

Figure 1. Framework of Thought Formulation of Structural Model Theory

***Measurement Model Analysis (Outer Model)*:** The measurement model, also known as the outer model, describes the relationship between each indicator and its latent variable. Assessment of the measurement model involves confirmatory factor analysis to test convergent and discriminant validity. Reliability testing is done using two methods: Cronbach's Alpha and Composite Reliability (Purwanto & Sudargini, 2021). The Outer Model serves as a measurement model to evaluate construct validity and reliability, with parameters such as convergent validity, discriminant validity, composite reliability, and Cronbach's alpha which are very important for the accuracy of the prediction model (Janadari *et al.,* 2016). The results of the outer model processing are depicted in Figure 2.

Figure 2 illustrates the elimination of various research instruments that are considered invalid (outer loading value <0.5). In the extension agent competency variable, four indicators were identified as invalid: X3.7 (0.359), X3.8 (0.099), X3.9 (-0.091), and X3.10 (0.165). For the extension performance variable, there are three invalid indicators, namely Y2.1 (0.400), Y2.2 (0.317), and Y2.6 (0.053). According to Chan & Idris (2017), a factor loading value between 0.50 and 0.60 is considered sufficient for research in the early stages of developing a measurement scale. Kamis *et al.* (2020) and Pervan *et al.* (2017) also support the opinion that an outer loading value of 0.50 to 0.60 is satisfactory for convergent validity requirements.

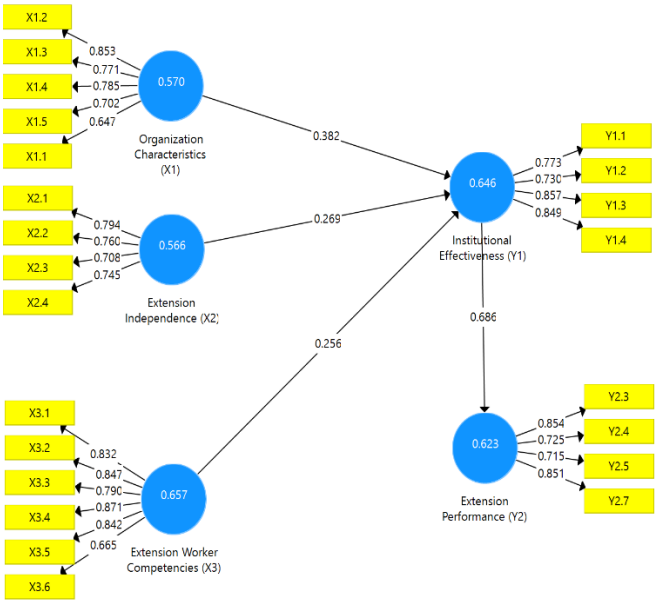

Figure 2. Outer Model Data Processing Results

In this study, the loading factor limit set is 0.5. Another parameter considered in evaluating the cross-loading value is *Average Variance Extracted* (AVE). If the correlation of the indicator with the latent variable exceeds its correlation with other latent variables, it indicates high discriminant validity (Anekawati *et al.,* 2017). The AVE value in this study is recommended ≥ 0.5.

The model reliability test uses the composite reliability test, which is reinforced by alpha. Composite reliability assesses the reliability of indicators on a variable, and a variable is considered unreliable or meets alpha's value if it has a value> 0.6. Latent variables are considered to have good reliability if the compesite reliability value exceeds 0.6. The compesite reliability coefficient should ideally exceed 0.7, although a value of 0.6 is still acceptable (Hair *et al.,* 2014). Internal consistency is not an absolute necessity once construct validity has been established because valid constructs are inherently unreliable, but the reverse may not be true (Mohajan, 2017). Composite reliability values of 0.6 to 0.7 and Cronbach's alpha values > 0.7 are considered good indications of unreliability (Sarstedt *et al.,* 2021).

Figure 2 shows that all research variable instruments are valid because they have met the required convergent validity, which has an outer loading higher than 0.5. The following are the results of testing the measurement model (outer model) which includes measurement of *convergent validity*, *discriminant validity*, *composite reliability* and *Cronbach's alpha* of constructs or variables of organizational characteristics, extension agent independence, extension

agent competence, institutional effectiveness, and extension agent performance.

Table 1. Measurement Model Analysis (Outer Model).

Variables	Indi-cator	Loading Factor	Crombach Alpha	Composite reliability	AVE
Organization Characteristics	X1.1	0.647	0.827	0.868	0.570
	X1.2	0.853			
	X1.3	0.771			
	X1.4	0.785			
	X1.5	0.702			
Extension Independence	X2.1	0.794	0.749	0.839	0.566
	X2.2	0.760			
	X2.3	0.708			
	X2.4	0.745			
Extension Worker Competencies	X3.1	0.832	0.895	0.920	0.657
	X3.2	0.847			
	X3.3	0.790			
	X3.4	0.871			
	X3.5	0.842			
	X3.6	0.665			
Institutional Effectiveness	Y1.1	0.773	0.815	0.879	0.646
	Y1.2	0.730			
	Y1.3	0.857			
	Y1.4	0.849			
Extension Performance	Y2.3	0.854	0.795	0.868	0.623
	Y2.4	0.725			
	Y2.5	0.715			
	Y2.7	0.851			

Source: Processed Primary Data, 2023.

Table 1 shows for exogenous variables valid indicators for organizational characteristics include: resources (X1.1), leadership (X1.2), rewards (X1.3), work programs (X1.4), and organizational structure (X1.5). On the extension agent independence variable, valid indicators include: economic independence (X2.1), intellectual independence (X2.2), emotional independence (X2.3), and social independence (X2.4). On the extension agent competency variable, valid indicators include: the ability to plan extension (X3.1), the ability to implement extension (X3.2), the ability to evaluate and report extension (X3.3), the ability to develop agricultural extension (X3.4), the ability to develop the agricultural extension profession (X3.5), and the ability of agricultural extension leadership (X3.6). On endogenous variables, valid indicators for institutional effectiveness include: resources (Y1.1), leadership (Y1.2), goal achievement (Y1.3), and policy (Y1.4). On the extension performance variable, valid indicators include: the implementation of extension program evaluation (Y2.3), extension development (Y2.4), extension professional development (Y2.5), and the implementation of technical assistance in rice cultivation (Y2.7).

***Structural Model Analysis (Inner Model)*:** The next test after the measurement model analysis (outer model) in SmartPLS analysis is the inner model analysis. The findings of the measurement model analysis (outer model) indicate that the constructs or variables meet the criteria for data validity and reliability (Wong, 2013). The following are the results of the model structure assessment (inner model).

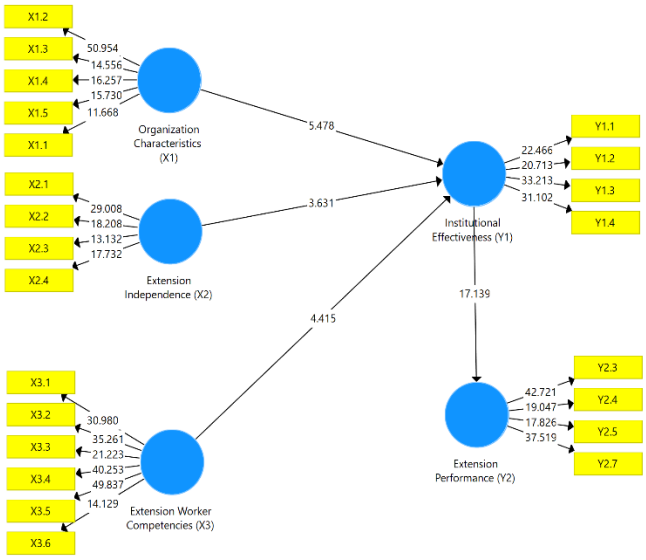

Figure 3. Structural Model Evaluation Results Based on T-Count.

Structural model checking is covered in the inner model analysis. In research, inner model analysis consists of assessments such as Path Coefficient, R-Square (R^2), Goodness of Fit (GoF), and Q-Square/Predictive Relevance testing. Model fit testing, which includes Goodness of Fit, is used to ensure the fit of the model to the data.

***Path Coefficient Test*:** The path coefficient assessment serves to show the direction of influence exerted by the independent variable on the independent variable (Wong, 2013). A positive path coefficient value indicates a unidirectional influence of the independent variable on the independent variable, while a negative value indicates an opposite influence. The path coefficient test also reveals the extent of the influence of exogenous variables on endogenous variables. The results of the Path Coefficient test can be seen in Table 2.

Table 2. Path Coefficient Value of the Research Dependent Variable.

Building	Institutional effectiveness (Y1)	Extension worker performance (Y2)
Organizational characteristics (X1)	0.383	
Extension worker Independence (X2)	0.259	
Extension worker Competence (X3)	0.269	
Institutional effectiveness (Y1)		0.688

Source: Processed Primary Data, 2023

Table 2 shows that each variable in this model shows a positive path coefficient. This indicates that as the path coefficient value increases for exogenous variables in relation to endogenous variables, the influence between exogenous variables and endogenous variables becomes stronger.

***R-Square (R²)*:** Analysis of variance, also known as the test of determination (R-Square), is performed to assess the extent of the influence of each independent variable on the dependent variable, as indicated by the R-Square value (Wong, 2013). The coefficient of determination (R-Square) serves as a metric to measure how much endogenous variables are influenced by other variables. A higher R-Square value indicates a more effective prediction model for the proposed research. The R-Square (R²) value can be used to evaluate the impact of certain endogenous variables and whether exogenous variables have a significant influence (Suhan *et al.*, 2018). The R-Square values are presented in Table 3.

Table 3. R-Square Value (R²).

Construct	R Square	R Square adjusted
Institutional effectiveness (Y1)	0.623	0.616
Extension worker performance (Y2)	0.471	0.468

Source: Processed Primary Data, 2023.

Table 3 illustrates that the R-Square for the institutional effectiveness variable of agricultural extension is 0.623, indicating that 62.3 percent is influenced by variables of organizational characteristics, extension agent independence, and extension agent competence. While the extension performance variable shows an R-Square value of 0.471, meaning that 47.1 percent of the extension performance variable is influenced by institutional effectiveness. Based on the R-Square obtained from this study, it can be concluded that the model falls into the moderate category. According to Hair *et al.* (2014) R-Square results of 0.67 and above for endogenous latent variables in structural models indicate that the influence of exogenous variables (which cause effects) on endogenous variables (which are affected) is considered good. Conversely, if the R-Square result ranges from 0.33 to 0.67 it is categorized as moderate, and if it is between 0.19 to 0.33 it is categorized as weak. The criteria for interpreting the R-Square are as follows: (1) An R-Square value of 0.75 and above indicates a strong influence between constructs; (2) An R-Square value in the range of 0.50-0.75 indicates a moderate influence between constructs; and (3) An R-Square value in the range of 0.25-0.50 indicates a weak influence between constructs (Hair *et al.*, 2014).

***Goodnes of Fit (GoF)*:** Goodness of Fit (Gof) to validate the overall model. Goodness of fit for evaluation of measurement models and structural models, simple measurements for model prediction (Purwanto and Sudargini, 2021). Goodness of Fit (GoF) is a measure of the feasibility of a model. The GoF formula used is as follows.

$$GoF = \sqrt{\overline{AVE}\ x\ \overline{R^2}}$$
$$GoF = \sqrt{0{,}61244\ x\ 0{,}54659}$$
$$GoF = \sqrt{0{,}3348}$$
$$GoF = 0{,}5786$$

The Goodness of Fit (Gof) value is 0.5786. Where the greater the GoF value, the more appropriate the model depiction. The GoF value category according to Sarwono and Narimawati (2015) is divided into three, namely 0.1 (weak), 0.25 (moderate), and 0.36 (large). The GoF value of 0.5786 is interpreted as a large GoF, meaning that the measurement model (outer model) with the structural model (inner model) is feasible or valid.

An effective model of extension institutions through organizational characteristics, extension agent independence, extension agent competence, institutional effectiveness, and extension agent performance is feasible or valid. The effective model of extension institutions in improving the performance of extension workers in this study is the characteristics of the organization, the independence of extension workers, and the competence of extension workers can increase the effectiveness of agricultural extension institutions.

***Q-Square/Predictive Relevance*:** *Q-Square* (Q2) or predictive relevance is a predictive relevance test for structural models, the purpose of testing predictive relevance is to find out how well the observation value produced by the model and the estimation of its parameters. It is known that if the Q-Square value is greater than 0, it can be said that the model has predictive relevance. To calculate the Q-Square value, you can use the formula: *Q-Square* (Q^2) = 1 - (1 - R^2 2) (1 - R^2 2) ... (1- Rp 2), where R1 2 , R2 2 ... Rp 2 is the *R-Square of the* dependent variable. The following are the results of calculating the *Q-Square* value.

$$Q - Square = 1 - [(1 - R^2\ 1)x\ (1 - R^2\ 2)]$$
$$Q - Square = 1 - [(1 - 0{,}623)x\ (1 - 0{,}471)]$$
$$Q - Square = 1 - [0{,}377x\ 0{,}529]$$
$$Q - Square = 1 - [0{,}1994]$$
$$Q - Square = 0{,}8006$$

The Q-Square (Q2) value or predictive relevance in this study is 0.8006. From these results it is known that this research model has predictive relevance because Q2 is greater than 0 and can be said to be good because it is close to the value of 1. Sarstedt *et al.* (2011), state that the Q-Square value is also used to determine the goodness of the model, where the higher the Q-Square value indicates that the structural model is more suitable (fit) with the data.

***Hypothesis Testing*:** Hypothesis testing involves examining the original sample estimated values (O) to ascertain the direction of the relationship between variables. In addition, the t-statistic (T) and P-value (P) are scrutinized to determine the significance level of the relationship. An original sample value close to +1 indicates a positive relationship, while a value close to -1 indicates a negative relationship. A t-statistic value exceeding 1.96 or a P-value smaller than the

significance level (<0.05) signifies the significance of the relationship between the variables (Sarstedt *et al.*, 2021). In this study, there are two hypotheses developed by researchers in analyzing the institutional model of extension workers in improving the performance of agricultural extension workers in Southeast Sulawesi Province. These hypotheses are as follows.

***The first hypothesis, viz*:** H_0= The exogenous variables of organizational characteristics, extension agent independence, and extension agent competence have no effect on the endogenous variable of institutional effectiveness of agricultural extension.

H_1 = There is at least one exogenous variable of organizational characteristics, extension agent independence, and extension agent competence that affects the endogenous variable of institutional effectiveness of agricultural extension.

***The second hypothesis, viz*:** H_0 = The endogenous exogenous variable of institutional effectiveness of agricultural extension does not affect the endogenous variable of agricultural extension performance.

H_1 = The endogenous exogenous variable of institutional effectiveness of agricultural extension has a real effect on the endogenous variable of agricultural extension performance.

Table 4 shows that the hypothesis in this study is valid because the hypothesis has a P-Value <0.05. Based on the information presented in Table 4, it can be concluded that the first hypothesis found that H_1 is accepted or the hypothesis stating that there is at least one exogenous variable of organizational characteristics, extension agent independence, and extension agent competence that affects the endogenous variable of institutional effectiveness of agricultural extension in Southeast Sulawesi Province is accepted.

Table 5 shows that the hypothesis in this study is valid because the hypothesis has a P-value <0.05. Based on the information presented in Table 5, it can be concluded that in the second hypothesis developed by the researcher, H_1 is accepted or the hypothesis that the endogenous exogenous variable of institutional effectiveness of agricultural extension has a real effect on the endogenous variable of agricultural extension performance is accepted.

***The Effect of Organizational Characteristics on the Effectiveness of Agricultural Extension Institutions*:** The data presented in Table 4 shows that the P-values are 0.0000, which is less than 0.05. These results indicate that organizational characteristics have a large and direct impact on the effectiveness of agricultural extension institutions in Southeast Sulawesi Province. Organizational characteristics are closely related to the nature or characteristics inherent in an organization so that it can represent the vision and mission of the organization. The effectiveness of agricultural extension institutions must have distinctive and unique characteristics that can distinguish these institutions from other institutions.

***The Effect of Extension Worker Independence on the Effectiveness of Agricultural Extension Institutions*:** The data presented in Table 4 shows that the P-values are 0.001, which is less than 0.05. These results indicate that the independence of extension workers has a large and direct impact on the effectiveness of agricultural extension institutions in Southeast Sulawesi Province. Extension workers who have independence reflected in having high self-confidence, always optimistic about the tasks assigned and high fighting power, the attitude of being able to cooperate with other parties in an equal position so that there is interdependence in a mutually beneficial situation in a sustainable business partnership, the attitude of having high filtering power in determining the best choice of action for alternative businesses pursued in their lives, and the attitude of constantly improving their lives through various efforts to broaden the horizons of thinking and knowledge, attitudes and

Table 4. Effect of Exogenous Variables on Endogenous Variables.

Construct	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Organizational Characteristics (X1) -> Institutional Effectiveness (Y1)	0.382	0.381	0.069	5.566	0.000
Extension Worker Independence (X2) -> Institutional Effectiveness (Y1)	0.269	0.269	0.078	3.439	0.001
Extension Competence (X3) -> Institutional Effectiveness (Y1)	0.256	0.260	0.062	4.131	0.000

Source: Processed Primary Data, 2023.

Table 5. Effect of Endogenous Exogenous Variables on Endegon Variables.

Construct	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Institutional Effectiveness (Y1) -> Extension Performance (Y2)	0,686	0,687	0,040	17,062	0,000

Source: Processed Primary Data, 2023

skills, so that they respond positively to changes in the situation and try to consciously overcome problems with procedures that are considered the most appropriate will affect the performance of agricultural extension workers. So that the better the nature of independence possessed by agricultural extension workers will have an impact on increasing the effectiveness of agricultural extension institutions. In improving the performance of agricultural extension institutions, it is necessary to consider and pay attention to the extension agent's independence factor as one of the aspects that must be developed to support sustainable agricultural development.

***The Effect of Extension Competence on the Effectiveness of Agricultural Extension Institutions*:** The data presented in Table 4 shows that the P-values are 0.000, which is less than 0.05. These results indicate that extension worker competence has a large and direct impact on the effectiveness of agricultural extension institutions in Southeast Sulawesi Province. Extension competence is the ability possessed by an extension worker in performing work or tasks based on skills and knowledge and supported by work attitudes. This means that the competence of extension workers is related to the basic abilities possessed by each individual extension worker to support the effectiveness of extension institutions in carrying out and achieving institutional goals. So that it will have an impact on improving the quality of life of the target of extension activities and still pay attention to its sustainability aspects.

***Effect of Institutional Effectiveness on Agricultural Extension Performance*:** The data presented in Table 5 shows that the P-values are 0.000, which is less than 0.05. These results indicate that institutional effectiveness of agricultural extension has a large and direct impact on the performance of agricultural extension workers in Southeast Sulawesi Province. Institutional effectiveness is the level of organizational success in achieving its goals and objectives. Effective extension institutions are supported by the quality and success of each individual extension agent in carrying out their duties and responsibilities. So that this will have an impact on improving the performance of each agricultural extension worker as seen from the success of extension workers in planning, implementing and evaluating extension activities that have been carried out.

***Conclusion*:** organizational characteristics, extension agent independence, and extension agent competence have a real and positive influence on the effectiveness of agricultural extension institutions. Furthermore, the effectiveness of agricultural extension institutions affects the performance of agricultural extension workers in Southeast Sulawesi Province. The theoretical model of extension institutions built has been able to measure and predict the existence of extension institutions in the future, so that it becomes an applied system model that accommodates current and future agricultural development opportunities.

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