

# Disaster Early Warning and Information Services Meteorology, Climatology and Geophysics Agency's Employees Performance Observed from their Motivation and Competency

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## Disaster Early Warning and Information Services Meteorology, Climatology and Geophysics Agency's Employees Performance Observed from their Motivation and Competency

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### ABSTRACT

Improvement is needed in the early warning system and information services of Indonesia Agency for Meteorology, Climatology and Geophysics (Badan Meteorologi, Klimatologi dan Geofisika-BMKG) in term of speed, and accessibility by rural communities. This paper analyzes the factors related to the motivation and competency of BMKG employees' performance in giving information services related to early warning system. The aim is to determine the effect of motivation and competency partially and simultaneously toward BMKG's employees performance. Using quantitative method with proportionate stratified random sampling technique, total 80 respondents were interviewed among 389 population of BMKG's employees who work on Deputy of Meteorology, Climatology, and Geophysics. The result indicated that the motivation and competency have significant impact to the BMKG's employees performance.  $R^2$  is 0.832 which means that the motivation and competency simultaneously have significant impact to employees performance about 83.2% while the remaining 16.8% influenced by others variable outside the variables studied. The data analyzed using double linear regression in SPSS version 24, the equation regression obtained is:  $Y = 9,429 + 0,408X_1 + 0,822X_2$ , indicating that effect of motivation factor is lower than competency factor toward employees performance. Therefore BMKG Head Office needs to improve the competency of employees more than motivate them in order to improve its performance on information services and disaster early warning.

## INTRODUCTION

Indonesia with its unique position in the globe, diverse and complex topography, wide sea surface that have led Indonesia to have high climate variability such as rainfall that led to extreme condition, both based on time and place [1]. These extreme condition could led to disaster. Disasters caused by meteorology, climatology, geophysics and air quality factor is one of the nonmilitary threats. At this moment, nonmilitary threats is more dominating, complex and multidimensional [2]. In order to face

non-military threats, the National Defense System places the government as the main element outside defense sector. In a defense white paper noted that the disaster included into non military threats that require treatment or Military Operations Other Than War (MOOTW). BMKG is a Non Ministerial Government Institution has 18 functions, one of which is to deliver information and early warning system to institutions, related agencies, and communities on disasters event caused by meteorology, climatology, geophysics, and air quality factors. Early warning system could help disseminate information related to disaster rapidly and cover larger area so that more people well informed and the number of casualty would be less. Disastrous event are likely to happen again in the future [3], the performance of BMKG employees to forecast and disseminate reliable information in a fast and accurate manner will give great contribution to disaster risk reduction effort.

This paper analyzes the factors related to the motivation and competency of BMKG employees' performance in giving information services related to early warning system. According to the theory of motivation mentioned by Robert Kreitner and Angelo Kinicki in 2001 that motivation is a psychological process that generates and directs behavior at achieving the objective or goal-directed behavior (p. 205) [4]. There are seven motivational factors, namely: a. promotion; b. Work performance; c. The job itself; d. Appreciation; e. Responsible; f. Recognition; g. Success in work [5]. BMKG information service is not optimal, especially related to the interests of stakeholders and the public in improving disaster preparedness. This can be seen by looking at the persistence of the problems as follows:

- a. Service information early warning of extreme weather and public weather that has not been evenly distributed throughout the territory of Indonesia.
- b. Service climate and air quality information less quickly spread into the wider community and still difficult to access by rural communities.
- c. An informed understanding of climate, air quality, the earthquake and tsunami early warning in the society is still weak.
- d. Outreach earthquake information and tsunami warnings that have not been evenly distributed to all regencies/cities prone to earthquakes and tsunami disaster.

Based on the above conditions, the implementation of BMKG information delivery system is expected to reduce material losses and casualties caused by natural disasters. The fast information of early warning system, precise, accurate, easy to understand and far-reaching certainly be used in disaster mitigation and public agencies. Therefore, to improve the quality of information services and early warning, BMKG need to further improve their performance. In improving their performance, BMKG needs the support of adequate human resources (HR). HR performance is influenced by several factors, some of which are discussed in this paper is the motivation and competency. The purpose of this paper is to analyze the influence of motivation and competency to employee performance in service-related information and disaster early warning.

## **METHOD**

Type of research include quantitative research to analyze the influence of motivation and competence to employee performance in service-related information and disaster early warning. The location of this research at the Head Office's BMKG, especially at Meteorology, Climatology and Geophysics Deputy located at Jl. Angkasa 1 No. 2 Kemayoran, Jakarta, Indonesia. Questionnaires were distributed to 80 respondents of 389 population of BMKG employee on duty. Variability and reliability test were conducted prior to 25 respondents.

The research sample taken using proportionate stratified random sampling technique. This technique is used because the population has members who are not homogeneous and stratified proportionally, in this study sample was taken by education, length of service, age and class. The number of samples taken randomly from several units contained on Meteorology Deputy, Climatology Deputy and Geophysics Deputy, the number of samples is determined using Slovin formula. The quantitative data in this study as the primary data were supported by secondary data. Secondary data obtained through documents-documents related to employee performance at BMKG Center. Both variables influence

the motivation and competence as an independent variable to employee performance (as dependent variable) were analyzed using multiple regression. Overview and models of influence between the study variables are presented in Figure 1.

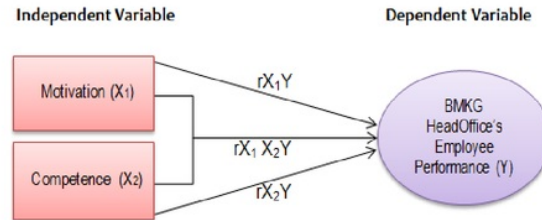


Figure 1. Models of influence between the research variables

Operational variables in this research is presented in the following table:

Table 1  
Operational Variables

Variable	Definitions Variable	Dimension	Indicator	Data Scale
Performance (Y)	The performance is the result of work related to organizational objectives such as quality, efficiency and other criteria of effectiveness (p. 374) [6]	1. Effectiveness 2. Timeliness 3. Efficient 4. Quality 5. Satisfaction	1. Easy to understand 2. Reliable 3. The ability to complete the job quickly 4. Timely 5. Accountability 6. According to the procedure of work 7. Thorough 8. Accurate 9. Easily accessible 10. Spread completely	Ratio
Motivation (X1)	Motivation is the desire to act (p.6) [7]	1. Easy to understand 2. Reliable 3. The ability to complete the job quickly 4. Timely 5. Accountability	1. Hard work 2. Achievement of the objectives 3. The drive to succeed 4. Feedback 5. Improved skills 6. The drive for progress 7. Independent work 8. Love the challenge 9. Interpersonal relationships 10. Policy	Ratio
Competence (X2)	Competence is the basic foundation of his characteristics and indicate how to behave or think, equating the situation, and support for a period of time long enough (p. 9) [8]	1. Knowledge 2. Skills 3. The concept of self 4. Personal characteristics 5. The experience affects	1. Think analytically 2. Knowledge of the job 3. Looking for proactive information 4. Attention to the clarity of task 5. The ability to direct 6. Empathy 7. Confident 8. Commitment to the organization 9. Cooperation group 10. Ability	Ratio

Source: Author from various sources

## RESULTS AND DISCUSSIONS

### Analysis of Relationship between Two Variables (Bivariate Analysis)

Table 2 shows the relationship between motivation and employee performance; the higher the motivation, the higher the employees performance. Table 3 shows the relationship between competence and performance; the higher employee's competence, their performance also higher.

Table 2  
Correlation of Motivation with Employee Performance

		Motivation	Performance
Motivation	Pearson Correlation	1	0.839**
	Sig. (2-tailed)		,000
	N	80	80
Performance	Pearson Correlation	0.839**	1
	Sig. (2-tailed)	,000	
	N	80	80

\*\* . Correlation is significant at the 0:05 level (2-tailed).

Source: Processed SPSS Statistics 24, 2016

Table 3  
Correlation of Competency with Employee Performance

		Competency	Performance
Competency	Pearson Correlation	1	0.901**
	Sig. (2-tailed)		,000
	N	80	80
Performance	Pearson Correlation	0.901**	1
	Sig. (2-tailed)	,000	
	N	80	80

\*\* . Correlation is significant at the 0:05 level (2-tailed).

Source: Processed SPSS Statistics 24, 2016

Respondents were given a questionnaire with 14 questions about the motivation on employee performance with statement number as many as 19 in a Likert scale were each assessed by scoring. Criteria motivation BMKG Head made in statements consisting of the dimensions of responsibility, achievement, self-development, self-reliance in charge and working conditions. Analysis of motivation is important in this research, it is based in large part as the determination of the level of motivation needed to determine the effectiveness of employee performance levels expected at BMKG Center. Results of research on the effects of motivation on employee performance BMKG center is consistent with the concept described in Robert Heller [7] which states that motivation is the desire to act that can be used to predict the level of performance of employees BMKG Center.

The level/degree of BMKG employees competency using competency level of knowledge, skills, self-concept, personal characteristics and experience. Skill is the ability to perform a task and responsibility regarding information and early warning. Self-concept is the attitudes, values, or the self-image of an employee in the BMKG information services and early warning. Personal characteristics may influence the membership of the managers and workers in a number of competencies, including conflict resolution, showing concern interpersonal, ability to work in teams, influence and build relationships. The expertise of many competency requires people to organize

thoughts, communication in the presence of a group, solve problems, and so on [8]. Research results are consistent with the concept described in Spencer and Spencer [8] that the competence is something inherent in a person that can be used to predict the level of performance of BMKG employees in information services and early warning. In this research that could be about knowledge, abilities/skills, self-concept, personal characteristics and experience [9]. Thus, the competence variables have a positive influence on employee performance. Competence also improve preparedness [10]. Evaluation of competencies possessed by each employee must be done, because it will be able to predict the performance of employees in giving BMKG information and early warning service. This is relevant to Wibowo [11] that competence can be used as the main criteria for assessing the performance. Employees who have a good competence will be able to acquire and develop the task [8], [12].

#### **Multivariate Analysis of Competence and Motivation on Employee's Performance**

Classical assumption (requirements regression) include tests were performed prior to the multiple regression analysis (multivariate analysis) between the motivation and competency to the employee's performance. Those are normality, homoscedasticity (equality test of variance), serial correlation test, and multicollinearity test. The test has been qualified classical assumption test with the following explanation:

1. Test normality meet the assumptions of normality for using Kolomogorof-Smirnov statistic, data spread around the diagonal line and follow the direction of the diagonal line as shown in Figure 2.

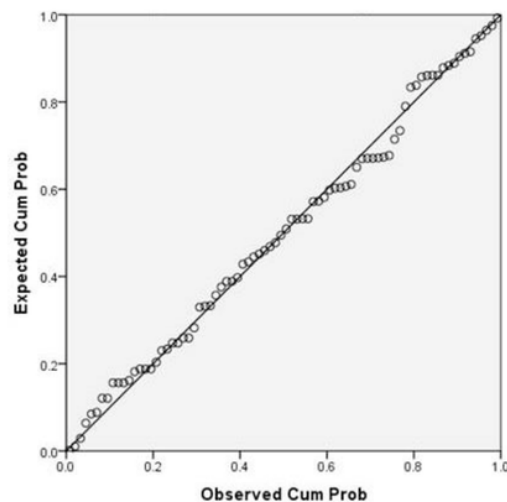


Figure 2. Normal P-P Plot of Regression with Performance as Dependent Variable

2. Test homoscedasticity (variance equality test) has been fulfilled, a plot residuals scattered and spread evenly around the zero point line as shown in Figure 3.

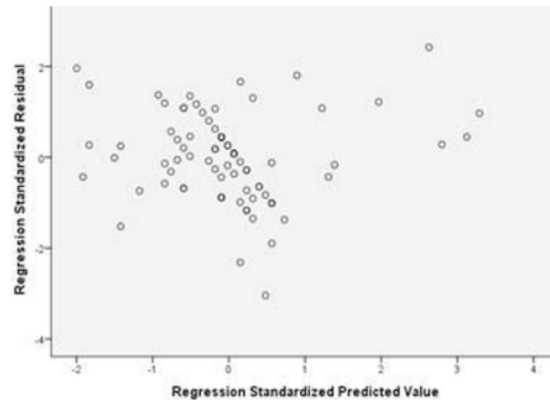


Figure 3. Variance Equality Test with Performance as Dependent Variable

3. Serial correlation test was met because the value of Durbin-Watson is between -2 to +2 (1.984)
4. Test multicollinearity free from classical assumption, the correlation value is not more than 0.8 ie 0.268 and 0.674 for motivation variables and competence variables respectively.

Classic assumption test results are eligible to continue to the multiple linear regression tests. The results of multiple regression tests is shown in Table 4 below:

Table 4  
Multiple Regression Analysis Result

Model	unstandardized Coefficients		standardized Coefficients	t	Sig.
	B	Std.Error	beta		
1 (Constant)	9.429	3.893		2.422	0.018
Motivation	0.408	0.133	0.268	3.060	0.003
Competency	0.822	0.107	0.674	7.689	0.000

Dependent Variable: Employee's Performance

Source: Processed SPSS *Statistics* 24, 2016

From multiple regression analysis, the regression equation result is:

$$Y = 9.429 + 0.408X_1 + 0.822X_2$$

Where:

Y= employee's performance

X<sub>1</sub>= employee's motivation

X<sub>2</sub>= employee's competency

The result can be explained as follows:

- a. The constant of 9.429 means that if the value of motivation and competence is zero, then the value of employee performance is 9.429.
- b. Motivation variable regression coefficient of 0.408 means that if another independent variable (competency) has a fixed value and the motivation increases 1 unit, the performance of employees will increase by 0.408 units. The motivation coefficient is positive meaning a positive influence or direction of the motivation on employee's performance.
- c. Competence variable coefficient is 0.822 means that if the motivation variable coefficient has a fixed value and competence increases one unit, then the employee's performance of BMKG Centre will increase by 0.822 units. The competence coefficient is positive means positive influence or direction of the competence on employee's performance.

- d. The results shows that the regression coefficient for competency variable is 0.822 that greater than motivation regression coefficient (0.408), means that competence has a greater influence than the motivation to employee performance in information services and early warning. Employees of BMKG Centre has high competence known from the dominant education level of members is which are bachelor degree, followed by mater and doctoral graduates, but the employee performance will not maximum without motivation, so the performance of employees in the Central BMKG information and early warning service can be improved by improving motivation aspects.
- e. R square value is equal to 0.832 or 83.2%. This shows that the amount of variation that provides simultaneous positive influence between motivation and competence to employee performance amounted to 83.2%, the remaining 16.8% is influenced by other variables not examined in this study. However, variables examined has larger value than from variables which were not examined. The possibility that other variables, such as: leadership, teamwork, and cultural conditions of members to the performance, the attitude/behavior of members to the performance, and the empowerment of members [9].

### **CONCLUSION AND SUGGESTION**

Based on data analysis and discussion, it can be concluded several things:

- a. Bivariate analysis shows that motivation has positive influence on employee performance of BMKG Center. So does competency has positive influence on employee performance of BMKG Center. Competency became a major factor in the employees performance in early warning and information service, its regression coefficient of 0.822 which is greater than the regression coefficients of motivation (0.408).
- b. Motivation and competence simultaneously have a positive influence on employee performance of BMKG Centre by 83.2%, and the influence of other variables not examined is lower at 16.8%. Thus, the performance achievement BMKG Center employees in early warning and information services is determined by competency and motivation.

Based on the research and study of theory, suggestion given is as follows:

- a. BMKG Centre should reevaluate the motivation of employee performance, employees motivation in this study has positive effect but still lower than competence. Therefore, each sub-section should help to improve efforts in order to increase motivation, by conducting a review, improvement of working conditions, working facilities, and giving awards to the employees.
- b. For BMKG Centre should be more focused in effort to increase the competency rather than attempt in increasing motivation of employee performance since the regression coefficient for competency is higher than the coefficient of motivation. Therefore, each sub-section should improve the competence in order to increase employees performance. The efforts could be provide training, assessment, and dissemination of education-related services and early warning information.
- c. Further research regarding performance evaluation of other variables that affect the performance of BMKG employees could be studied. For example, research regarding motivation (per category) to observe more detail on the behavior of the relationship and its influence.

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