### Determinants of Employee Green Behavior for Secretariat General Employees of the Ministry of Energy and Mineral Resources

Toha Trimono<sup>1</sup>, Lenny Christina Nawangsari<sup>2</sup> {tohatrimonoumbjkt@gmail.com<sup>1</sup>, lenny.christina@mercubuana.ac.id<sup>2</sup>}

Universitas Mercu Buana, Jakarta, Indonesia<sup>12</sup>

Abstract. The phenomenon of increasing waste and the use of paper, electricity and water among the secretariat general employees of the ministry of energy and mineral resources, does not reflect the application of a culture of employee green behavior. This study aims to examine the effect of green commitment, organizational culture, green transformational leadership, on employee green behavior in Secretariat General of the Ministry of Energy and Mineral Resources with work motivation as an intervening variable. The sampling method used was proportionate stratified random sampling. The instrument in this study used a questionnaire against 119 respondents (Slovin formula), which was analyzed descriptively and quantitatively. Data analysis using Structural Equation Model - Partial Least Square (SEM-PLS) analysis methods, and the results obtained that green commitment, organizational culture, and green transformational leadership have a positive and significant effect on work motivation and employee green behavior. Likewise, work motivation towards employee green behavior, and green commitment, organizational culture, and green transformational leadership have a positive and significant effect on employee green behavior with mediated work motivation. Organizational culture is the variable that has the most direct effect on employee green behavior.

**Keywords**: Green Commitment, Organizational Culture, Green Transformational Leadership, Work Motivation, Employee Green Behavior

#### 1 Introduction

Nature and the environment where life is an important thing that must be maintained by everyone, because nature or earth provides human needs such as sources of food, water, air and so forth. Everyone must preserve nature. Currently, humans feel many problems related to the destruction of nature such as deforestation, air pollution, waste disposal, climate change or global warming, biodiversity extinction, natural resource depletion, phenomena of ocean acidification, genetic engineering, acid rain, and etcetera. This becomes a serious problem and threatens human life, if not immediately addressed properly and seriously.

Data on the use of paper from forest products continues to increase every year, in Indonesia shows an average increase every year of 220 thousand tons, while in America the average increase is 14 million copies per year. In addition, the national electricity consumption which is increasing every year on average 46.5 kWh from 2015-2019 can cause waste of renewable energy resources and environmental damage, especially if these

conditions are not controlled properly. Data on deforestation events both nationally and internationally also increases every year. Likewise, with data from the use of electricity, water and paper consumption at the Office of the Secretariat General of the Ministry of Energy and Mineral Resources, it has also increased annually (without a significant increase in the number of employees). The use of paper, electricity and water from 2016-2018 increased by an average of 33,3%. This is a serious problem if left unchecked, without any effort to behave in a manner that takes into account environmental sustainability.

One of the ways to implement go green practices in organizations is through the creation and application of organizational culture in individuals and their organizations. A good work culture arises from the way of thinking of individuals in acting so as to form patterns of habits, value systems and interactions of shared beliefs which in turn can be used as norms and guidelines for acting behavior in organizations [1]. Go green behavior also arises when individuals have the motivation to apply healthy lifestyles both to the person and the environment. Motivating on self to every individual will give encouragement to the needs that can adapt to the environment and move to achieve goals, and also the vision and mission of the organization, and also supported by the participation of a good management executor. Several Researches [2,3,4,5,6,7,8,9] show that there is an influence on green commitment, organizational culture, green transformational leadership and work motivation on employee green behavior.

Management of human resources in organizations by taking pay attention to rules of environmental sustainability in an environmentally sustainable manner is the concept of GHRM [10] GHRM is expected to be able to make a major contribution in participating to preserve the environment, which can provide both short- and long-term benefits to the survival of individuals and business organizations. Each person adapts to the nature around the environment in which he lives, because basically a sense of love and having nature as a place of life exists in each human. Green behavior is a manifestation of the actions every individual based on affection, norms and values that pay attention to the environment's natural preservation [4] Commitments directed at environmental perspectives and organizational goals for sustainability must be convinced in each employee, which is a strong determination, a sense of being part of the organization, and a willingness to sacrifice time, thoughts, energy for progress and mutual prosperity [11]. This means that commitment is a dominant factor that can directly influence the attitudes and actions and mindset of employees to always make an optimal contribution to the organization.

Organizational culture is a system implemented by organizations with an emphasis on organizational values and the beliefs of each employee to be internalized in each task and function so that create effectiveness [12]. This reflects that the norms, values, beliefs, philosophy and attitudes of organizational members are carried out together to achieve organizational goals. Trust, admiration, respect, and always being loyal, as well as feeling something more than what is expected by employees towards their leaders with the priority of environmental sustainability is green transformational leadership [13]. This means that the source of employee confidence in leadership is how leaders motivate employees through organizational goals and objectives in a certain pattern.

Motivation is the process of achieving the goals of each individual that is reflected in the direction, perseverance and circumstances of the individual [14]. Work motivation can be interpreted as fulfillment the needs of individuals in achieving organizational goals by carrying out the encouragement that is on him to do a job effectively and efficiently.

#### 2 Research Method

Type of descriptive quantitative research, causal research categories. The study was conducted on employees the Secretariat General of the Ministry of Energy and Mineral Resources from October 2019 to April 2020. The population was 483 people so that a sample of 119 people was obtained (Slovin formula). The sampling technique used was proportionate stratified random sampling. The sample of this study refers to the criteria the Maximum Likelihood Estimation (MLE) technique [15]. A good number of samples according to MLE ranges from 100-200 samples. Data collection techniques using instruments in the form of a questionnaire. The measurement scale used is a Likert scale with a score range of 1-5. Likert scale is a scale used to measure people's attitudes, opinions, and perceptions about social phenomena [16]. The analysis technique used Structural Equation Model (SEM) that are operated through the Smart Partial Least Square (SmartPLS) Software Version 3.2.8. The steps in PLS include specifying models, estimating parameters, evaluating models, measuring outer models, conducting structural models (inner model), and testing hypotheses [17].

Commitment to the importance of the environment can be a high predictor of the behavior of individuals who pay attention to environmental sustainability [18]. The dimensions are affective commitment, normative commitment, and continuance commitment. Good implementation of organizational culture will affect the behavior and beliefs of employees and is an important factor for EGB [19]. For Organizational Culture, the authors use dimensions and indicators that is innovation and dare to take risks, attention to details, results oriented, individual oriented, team oriented, have a sense of aggressiveness, consistency [20]. Employees' efforts to do work are the concepts of employee behavior. In order for employees to have good behavior, effective leadership roles are needed. Transformational leadership that understands the fulfillment of the needs of employees, and is directed to the concept of green, can shape and encourage employee behavior to enthusiasm for work and implement the concept of green well in order to achieve organizational goals [21,8]. For green transformational leadership, the authors use dimensions that is idealized influence, inspirational motivation, intellectual stimulation, individualized consideration [4].

work motivation based on three dimensions that is the need for achievement, the need for affiliation, and the need for success/power [22]. Dimensions for Employee Green Behavior that is conserving, influencing others, taking initiatives, working sustainability, and avoiding harm [23]. Based on the above phenomena, the authors hypothesize the influence of the significance of the relationship between variables on employees of Secretariat General of the Ministry of Energy and Mineral Resources, as follows:

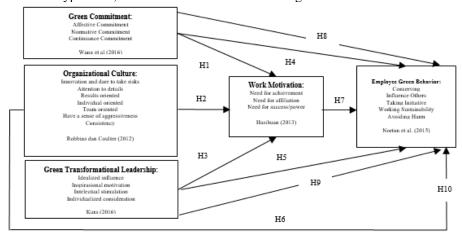
- H1: Green Commitment has a positive and significant influence on Work Motivation.
- H2: Organizational Culture has a positive and significant influence on Work Motivation.
- H3: Green Transformational Leadership has a positive and significant influence on Work Motivation.
- H4: Green Commitment has a positive and significant influence on Employee Green Behavior.
- H5: Green Transformational Leadership has a positive and significant influence on Employee Green Behavior.
- H6: Organizational Culture has a positive and significant influence on Employee Green Behavior.
- H7: Work Motivation has a positive and significant influence on Employee Green Behavior.

H8: Green Commitment has a positive and significant influence on Employee Green Behavior mediated by Work Motivation.

H9: Green Transformational Leadership has a positive and significant influence on Employee Green Behavior, mediated by Work Motivation.

H10: Organizational Culture has a positive and significant influence on Employee Green Behavior mediated by Work Motivation.

From this hypothesis, the authors describe the following framework:



**Fig 1.** Framework for Thinking Source: Data Processed by Author (2019)

#### 3 Results and Discussion

The Ministry of Energy and Mineral Resources (KESDM) was established on September 11, 1945 under the name of the Department of Mining and Geology (Chisitsu Chosajo). Business functions in the regulatory sector in the energy and mineral resources of the Republic of Indonesia. The Secretariat General of KESDM, based on regulation to coordinating the implementation of tasks, coaching, and providing administrative support to all organizational elements within the KESDM [24,25]. The main business challenges are realizing an Indonesia that is sovereign in the energy sector to realize the welfare of society, and the withdrawal of investors in the energy sector, as well as the rolling of the industrial revolution 4.0.

From the results of the study, respondents' interpretation of the questionnaire in the category agreed, with green commitment (X1) of 4.06 organizational culture (X2) of 4.15 green transformational leadership (X3) of 4.13 work motivation (Y1) of 4.16 and employee green behavior (Y2) of 4.18. This shows that all variables in the scope of categories are good.

#### 3.1 Outer Model (Measurement Model)

Tests conducted on the outer model using the Confirmatory Factor Analysis (CFA) technique. The construct confirmatory factor analysis is used to see the validity of each indicator and to test the reliability of the construct. In this study, the validity criteria based on the reflexive indicator model measured by convergent validity and discriminant validity. The

indicator on criteria convergent validity if the loading factor value is above 0.7 and is indicated by the Average Variance Extracted (AVE) value above 0.50. Construct reliability is measured by Composite Reliability and Cronbach's Alpha. The construct is said to be reliable if it has a Composite Reliability value of more than 0.70 and Cronbach Alpha is above 0.60 [17].

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**Fig 2.** Outer Model Research Source: Analysis Result uses SmartPLS 3.2.8

Table 1. AVE (Average Variance Extraction)

Variable	AVE Value
Green Commitment (X1)	0.531
Organizational Culture (X2)	0.521
Green Transformational Leadership (X <sub>3</sub> )	0.531
Work Motivation (Y <sub>1</sub> )	0.516
Employee Green Behavior (Y2)	0.530

Table 2. Composite Reliability and Cronbach Alpha

Variable	Composite Reliability	Cronbach Alpha	Remark
Green Commitment (X1)	0.931	0.920	Reliable
Organizational Culture (X2)	0.960	0.956	Reliable
Green Transformational Leadership (X <sub>3</sub> )	0.931	0.920	Reliable
Work Motivation (Y <sub>1</sub> )	0.928	0.915	Reliable
Employee Green Behavior (Y <sub>2</sub> )	0.958	0.953	Reliable

Figure 2 shows that the value of each loading factor is more than 0.70 in the variables and dimensions. This shows that all indicator variables used in the study are valid or have fulfilled convergent validity. Table 1 shows the value of AVE for all research variables and the dimensions of the study have a value above 0.5 so that the value of AVE for discriminant validity testing has been fulfilled, and can be continued to further testing. Table 2 shows that each variable has a composite reliability value above 0.7 and Cronbach's alpha above 0.6. It can be concluded that the model is fulfilled in the Composite Reliability and Cronbach's Alpha criteria so that the research model is fulfilled the reliability criteria and it is a reliable measuring tool category.

#### 3.2 Inner Model (Structural Model)

Table 3 shows the relationship between constructs based on the R-square (R2) adjusted value can be explained that the Employee Green Behavior (Y2) variable is 0.893, this shows that 89.3% of the Employee Green Behavior (Y2) variable can be influenced by the Green Commitment variable (X1), Organizational Culture (X2), Green Transformational Leadership (X3), and work motivation (Y1) while the remaining 10.7% is influenced by other variables outside the study. While the R-square Adjusted Work Motivation (Y1) value is 0.819, this shows that 81.9% of the Work Motivation (Y1) variable can be influenced by Green Commitment (X1), Organizational Culture (X2), and Green Transformational Leadership variables (X3) while the remaining 18.10% is influenced by other variables outside the study.

**Table 3.** Value of R Square from Research Model

Variable	R Square	R Square Adjusted
Employee Green Behavior	0.897	0.893
Work Motivation	0.824	0.819

Table 3 shows the relationship between constructs based on the R-square (R2) adjusted value can be explained that the Employee Green Behavior (Y2) variable is 0.893, this shows that 89.3% of the Employee Green Behavior (Y2) variable can be influenced by the Green Commitment variable (X1), Organizational Culture (X2), Green Transformational Leadership (X3), and work motivation (Y1) while the remaining 10.7% is influenced by other variables outside the study. While the R-square Adjusted Work Motivation (Y1) value is 0.819, this shows that 81.9% of the Work Motivation (Y1) variable can be influenced by Green Commitment (X1), Organizational Culture (X2), and Green Transformational Leadership variables (X3) while the remaining 18.10% is influenced by other variables outside the study. To evaluate R2, the calculate F statistic formula is used. The F statistic value from Work Motivation with R2 = 0.824 as follows:

value from Work Motivation with R2 = 0.824 as follows:  

$$F \text{ statistic} = \frac{\frac{R^2}{(k-1)}}{1-R^2/(n-k)} = \frac{\frac{0.824}{(4-1)}}{1-0.824/(119-4)} = 0.275 / 0.002 = 179.470$$

Significant test results simultaneously showed that the F statistic value in this study was 179.470, while F table values is 2.29 at  $\alpha = 0.05$  and df = n-k = 119-5 = 114. This means that F statistic > F table (2.29), so that there are simultaneously influences the variables of green commitment, organizational culture and green transformational leadership to the work motivation. The calculated F statistic value of the Employee Green Behavior with  $R^2 = 0.897$  as follows:

$$F \ statistic = \frac{\frac{R^2}{(k-1)}}{1 - R^2/(n-k)} = \frac{\frac{0.897}{(5-1)}}{1 - 0.897/(119-5)} = 0.224 \ / \ 0.001 = 248.119$$

Significant test results simultaneously showed that the F statistic value in this study was 248.119, while F table values is 2.29 at  $\alpha = 0.05$  and df = n-k = 119-5 = 114. This means that F statistic > F table (2.29), so that there are simultaneously influences the variables of green commitment, organizational culture, green transformational leadership and work motivation to the employee green behavior.

Furthermore, to validate the combined performance of the measurement model (outer model) and structural model (inner model) using the Goodness of Fit Index (GoF) test, and the following calculations are obtained:

GoF = 
$$\sqrt{AVE \times R^2}$$
 =  $\sqrt{0.526 \times 0.861}$  =  $\sqrt{0.452}$  = 0.673

Information:

AVE = 
$$(0.531+0.521+0.531+0.516+0.530)/5 = 0.526$$
 and R square =  $(0.824+0.897)/2 = 0.861$ 

The results of the Goodness of Fit Index (GoF) calculation showed a value of 0.673. According to Ghozali (2012), a small GoF value = 0.1 medium GoF = 0.25 and a large GoF = 0.36. Based on these results it can be concluded that the combined performance of the measurement model (outer model) and structural model (inner model) as a whole is good because the Goodness of Fit Index (GoF) value is more than 0.36 (large scale GoF). Furthermore, to validate the model, a predictive relevance ( $Q^2$ ) test is performed with the following results:  $Q^2 = 1 - (1 - R1^2)(1 - R2^2) = 1 - (1 - 0.824)(1 - 0.897) = 1 - 0.018 = 0.982$ 

Based on the predictive relevance  $(Q^2)$  calculation above, the value is 0.982. Greater than 0 (zero) so that the exogenous latent variable as an explanatory variable is able to predict its endogenous variable that is employee green behavior or in other words it can prove that this model is considered to have good predictive relevance.

#### 3.3 Hypothesis Testing

Table 4. Score of Path Coefficient, t statistics, and P-Values

Relationship between Construct	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ( O/STDEV )	P Values	Remark
Direct Influence						
Green Transformational Leadership -> Employee Green Behavior	0.235	0.232	0.072	3.260	0.001	Positive and Significant
Green Transformational Leadership -> Work Motivation	0.279	0.288	0.080	3.474	0.001	Positive and Significant
Green Commitment -> Employee Green Behavior	0.278	0.278	0.082	3.386	0.001	Positive and Significant
Green Commitment -> Work Motivation	0.422	0.415	0.092	4.563	0.000	Positive and Significant
Organizational Culture -> Employee Green Behavior	0.268	0.269	0.058	4.581	0.000	Positive and Significant
Organizational Culture ->	0.284	0.281	0.068	4.188	0.000	Positive and Significant

Work Motivation Work Motivation -> Employee Green Behavior	0.246	0.245	0.083	2.954	0.003	Positive and Significant
Indirect Influence						
Green Transformational Leadership -> Work Motivation -> Employee Green Behavior	0.069	0.071	0.033	2.076	0.038	Positive and Significant
Green Commitment -> Work Motivation -> Employee Green Behavior	0.104	0.100	0.039	2.684	0.008	Positive and Significant
Organizational Culture -> Work Motivation -> Employee Green Behavior	0.070	0.070	0.032	2.216	0.027	Positive and Significant

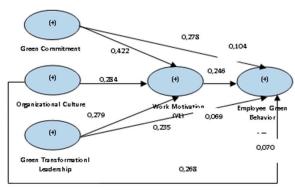


Fig 3. Direct and Indirect Test

To find out the influence of variable X to variable Y by comparing the value of t, if the t statistic is greater than t table then it has an influence. To determine the positive or negative effect, by looking at the original sample value, if the original sample value is positive, then the effect is positive. Meanwhile, to see the significance by looking at the p-values, if the p value is less than 0.05 so it is significant category. With df = n-k = 119-5 = 114 and  $\alpha$  = 0.05 obtained t table of 1.66. From table 4 and figure 3 it can be seen that H1, H2, H3, H4, H5, H6, H7, H8, H9, and H10 are accepted.

#### The direct influence of Green Commitment on Work Motivation

Green Commitment has a positive and significant effect on Work Motivation. This is in line with several research which states that there is a positive and significant influence between green commitment and work motivation [26,27]. High commitment can encourage employees to work harder and better, and have an impact on increasing motivation at work. Increasing the involvement of employees in organizational activities such as meetings, focus group discussions, outreach, education and training, is an effort that can be done by the organization's management of the Secretariat General of KESDM.

#### The direct influence of Organizational Culture on Work Motivation

Organizational Culture has a positive and significant effect on Work Motivation. This is in line with several research which states that there is a positive and significant influence

between organizational culture and work motivation [28,29,30,31,32]. Organizational culture can be done with well and truly, if all employees are able to work and understand in detail the types of work that must be completed. By doing work that is understood in detail by employees, will foster high motivation to complete the work properly and correctly, and as expected by the organization. Increased understanding of each employee related to the application of paperless, the use of sharing printers, understanding of electronic service manuscripts, the use of electronic signatures, comprehensive information through ESDM staffing information system help desk services, can be done by the organization's management.

#### The direct influence of Green Transformational Leadership on Work Motivation

Green Transformational Leadership has a positive and significant effect on Work Motivation. This is in line with several research [33,34,35] which states that there is a positive and significant influence between green transformational leadership and work motivation. Good transformational green leadership can be seen from leaders who encourage employees to use creativity in completing work related to environmentally friendly programs. High creativity can lead to a high sense of motivation in completing work that is faced properly and correctly in accordance with applicable rules and regulations. Energy and Water Saving Competition (HEDA) that has been run at the Central and Regional Governments, so that it can continue to be improved in accordance with the demands and developments of the era. Improvements to the operationalization of Nadine ESDM application, electronic signature, online attendance, adjusted for the presence of the Coronavirus disease 2019 (Covid-19) pandemic.

#### The direct influence of Green Commitment on Employee Green Behavior

Green Commitment has a positive and significant effect on Employee Green Behavior. This is in line with the research that if commitment to being environmentally friendly increases within the organization, then employee green behavior also increases [3]. To growth a sense of kinship that employees are part of the organization, can increase the commitment of employees to continue working in the organization. The implementation of the concept of green building, training and employee development related to the theme of go green, sharing knowledge, and seminars, needs to be continuously improved by the organization's management.

## The direct influence of Green Transformational Leadership on Employee Green Rehavior

Green Transformational Leadership has a positive and significant effect on Employee Green Behavior. This is in line with research which states that transformational leadership that has high environmental awareness and environmental responsibility, will have a significant impact on the implementation of the green behavior of its employees [4]. Leaders who solve problems from various points of view, while still paying attention and considering the sustainability of the environment, can also have a positive impact on the behavior of their employees to behave in an environmentally friendly manner. The hard skills and soft skills improvement program, workshops/FGD/education and training and the development of employee insights with the theme of environment, and the agent of change program can be carried out continuously by the organization's management.

#### The direct influence of Organizational Culture on Employee Green Behavior

Organizational Culture has a positive and significant effect on Employee Green Behavior. This is in line with several research that there is a positive and significant relationship between organizational culture and employee green behavior [5,19,36]. Organizational cultural values that are believed and implemented voluntarily on the awareness of the importance of the environment have a positive and significant effect on the behavior of its employees who are environmentally friendly. Increased sense of responsibility towards work and the environment, can improve the behavior of employees who are environmentally friendly. The implementation of organizational values according to the Decree of the Minister of Energy and Mineral Resources No. 1808 K/07/MEM/2015 can continue to be promoted and improved by the organization's management.

#### The direct influence of Work Motivation on Employee Green Behavior

Work Motivation has a positive and significant effect on Employee Green Behavior. This is in line with research [6,12] that proved Motivating employees through the transfer of knowledge and training related to the importance of the environment will make employees feel important and become part of the organization, which will make the behavior of employees voluntarily implement organizational policies that pay attention to environmental sustainability. Work motivation on employees can be increased if the organization provides more opportunities for employees to self-actualization. Enhancing education and training in Leadership Levels IV, III, II, and relating to accountability, nationalism, public ethics, quality commitment, anti-corruption, excellent services, standard operating procedures, professionalism of civil servants, can be carried out by organizational management.

# The indirect influence of Green Commitment on Employee Green Behavior with Work Motivation mediation

Green Commitment has a positive and significant effect on Employee Green Behavior mediated by Work Motivation. This is in line with research [7,37] that stated If commitment increases, work motivation will increase which in the end can lead to an increase in employee behavior towards a better direction. Employees who are committed to the importance of environmental sustainability, will increase work motivation through self-actualization and the desire for power/position, so that they voluntarily behave in an environmentally friendly manner. Education and training programs that support careers and positions such as business process management, financial management, operational management, personnel management, as well as improvement and development of employees' self-actualization spaces through the application of SIPEG ESDM, can be continuously improved by organizational management.

# The indirect influence of Green Transformational Leadership on Employee Green Behavior with Work Motivation mediation

Green Transformational Leadership has a positive and significant effect on Employee Green Behavior mediated by Work Motivation. This is in line with previous research [8,21] that stated Transformational leadership that is oriented towards the environment and understands the fulfillment of the needs of employees, will lead to motivation in working employees, which can shape and encourage employee behavior to be environmentally friendly and work to carry out tasks properly in order to achieve organizational goals. Organizational management can improve education and training programs related to management decision-making, increased creativity, innovation, insight, expertise and skills, scholarship programs,

study assignments, study permits, inclusion or internships both internally and externally of organization.

# The indirect influence of Organizational Culture on Employee Green Behavior with Work Motivation mediation

Organizational Culture has a positive and significant effect on Employee Green Behavior through Work Motivation. This is in line with previous research [9,38] that proved Organizational culture influences employee behavior and abilities and work motivation in carrying out the duties and functions of employees, which in turn affects the overall behavior in achieving organizational goals. Organizational management can increase the understanding of the details of the types of work that must be completed with a full sense of responsibility such as training and development of a code of ethics for civil servants, increasing the implementation of reward and punishment programs in a real and fair manner.

#### 4 Conclusions

Based on the analysis that has been conducted, it can be concluded that green commitment, organizational culture and green transformational leadership have a positive and significant effect on work motivation and employee green behavior. Work motivation has a positive and significant effect on employee green behavior. Likewise, green commitment, organizational culture and green transformational leadership have a positive and significant effect on employee green behavior by mediating work motivation. So that hypotheses 1 to 10 are all accepted.

Organizational activities that involve all employees can increase employee commitment to behave in an environmentally friendly manner. Application of the concept of green building, meetings, focus group discussions, internal and external organizational socialization, training and employee development with the theme of go green, information disclosure, sharing knowledge, and seminars. An understanding of details and a sense of responsibility can create an organizational culture that supports the development of employee behavior. Management can do this by increasing the implementation of organizational values, paperless practices, printer sharing, electronic office manuscripts, training code ethics of civil servant, reward and punishment programs in a real and fair manner.

Creativity and problem solving from various points of view can enhance green transformational leadership oriented toward environmentally friendly behavior. Energy and water saving (HEDA) competitions and agents of change can continue to be developed through innovation in accordance with the current development and demands of the times. Position/power and self-actualization have a big influence on employee motivation to behave green. Information disclosure, transparency and objective of job selection, functional position training, leadership level IV, III, II, and training related to self-actualization, such as training related to accountability, nationalism, public ethics, quality commitment, anticorruption, excellent service, operational standards procedures, professionalism of civil servants, insight of "wiyata mandala", transparency of information, operationalization of computers, internet and computer systems/software.

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