



Important Elements in Green Human Resource Management: An Analytical Approach Using a Fuzzy Interpretive Structural Modeling

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Abstract. Green Human Resource Management is an effort that can help reduce the impact of environmental damage. An important problem that has occurred so far is that the implementation of GHRM in organizations has not been able to run properly because they do not yet know what are the important elements/keys that affect successful implementation. In this study using the Fuzzy interpretive structure model (FISM). This method was chosen because it can help solve problems, especially related to data that is still blurry or biased. The results of the study found eight important (key) elements, namely: organizational culture; environmental awareness; policies and regulations; organizational commitment and discipline; awards and sanctions; behavior and motivation; competency and training; as well as socialization and communication. Research also produces levels (levels) of 8 elements which are divided into 4 levels. The first level contains E5 and E8; the second level contains E3, E4 and E6, the third level contains E2 while the fourth level contains E1 and E7. The results of this study are expected to assist stakeholders in implementing GHRM practices which they experience success after knowing the key elements, which can have an impact on increasing motivation in developing sustainable resources in organizations that have an impact on improving performance.

Keywords: green human resource management, fuzzy, interpretive structural modeling, analytical, element key.

1 Introduction

In general, researchers and environmental policymakers have mutually agreed that a reality about the causes of environmental damage such as resource deficits, increasing pollution, and biodiversity loss turns out to be derived from human behavior [1]. In response to this, many organizations tend to believe that the daily routine activities of their environment will not be disturbed by the implementation of Green Human Resource Management [2]. Therefore, this gives rise to the need to understand and shape the behavior of employees in minimizing the negative environmental impact of their activities in the organization. Green Human Resource Management (GHRM) and the resulting environment can be better understood this is in accordance with the theory of

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Ability-Motivation-Opportunity (AMO) which is the most dominant theory in understanding the practical impact of human resource management on organizational performance in empirical studies [3]. AMO theory explains that High-Performance Work Practices (HPWS) are a different but interrelated set of HR practices grouped based on three core aspects: ability, motivation, and opportunity.

According to Environment Performance Index (EPI) data, environmental quality in Indonesia is 116th out of a total of 180 countries, and 10th in Asia-Pacific with an EPI value of 37.8 [4]. Where we are still far behind Malaysia, Vietnam, and Thailand which have the status of developing countries and are in the top 100. From this, it can be seen that people's concern for environmental sustainability is still low. This can be based on a lack of self-motivation in behaving environmentally friendly. Organizations are considered effective platforms in implementing GHRM practices. This is based on several factors that affect GHRM implementation practices such as organizational / leader commitment, established rules / regulations, awareness of organizational members about the importance of environmentally friendly behavior, awards and training provided, to leader behavior [5]. So that the organization is expected to help raise awareness of environmental ethics in individuals [7].

The implementation of GHRM practices has been widely used by various sectors such as manufacturing industry, health, tourism, MSMEs, etc. [7]. It should be noted that research that addresses the theme of GHRM is very rarely carried out, it was found that only a few researchers have done it, such as Nosheen Anwar, conducted a study with a focus on highlighting the important role of environmentally friendly behavior of academic staff (educators) to improve performance whose result is that the practice of GHRM positively affects the performance of the campus environment. Another study related to this theme was also conducted by Faheem Gul Gilal who stated that the practice of GHRM positively improves environmental performance when employees show a passion for the environment [2]. In addition, Bahareh Shahriari also conducted research using the Grounded Theory approach from the results of this research to contribute significantly to the development of information on this problem and produce models in GHRM. It is interesting from his findings that Bahareh Shahriari et al managed to find conceptual models that were broken down into six main categories: core elements, causal elements, contextual elements, intervention elements, strategies, and consequences. From the results of the research of Bahareh Shahriari, it can be underlined that the practice of GHRM is very important to be applied because it can have an influence on improving performance as well as conceptual models that are broken down into six main categories [8].

Related to the conceptual model, which is broken down into six main categories, this is an attraction for researchers to study and analyze them more deeply because in the six main categories there are elements that can be key elements in relation to success in GHRM practice, but it is not yet known what these elements are. Therefore, researchers are interested in conducting studies and analyses of these elements to find out what key elements can determine and influence success in ghrm implementation. How to determine the key elements is a difficult job and how the relationship between the key elements and how the level (level) of each element is also a job that requires quite serious effort.

Therefore, this research is very important to be carried out and completed to obtain results in order to benefit stakeholders and obtain performance improvements in their organizations in the future. In this study, to assist in analyzing and the relationship between elements and obtaining levels, researchers plan to use the Fuzzy interpretive structural model (FISM), where this method is used to extract key elements that influence its implementation [9]. FISM was chosen because this method can help in solving problems, especially related to data that is still vague or biased. The results of this study are expected to help stakeholders so that the implementation of GHRM practice experiences success after knowing the key elements, which can have an impact on increasing motivation for the academic community in sustainable resource development which has an impact on improving performance.

2 Method

The research that has been conducted is divided into 5 (five) stages as shown in Fig. 1. The first stage begins with conducting a survey, followed by a literature study, then in order to obtain data entry according to the Fuzzy Interpretive Structural Model method used, the next stage is to hold an FGD (Focus Group Discussion). Entry data that has been obtained through FGD is then processed using the Fuzzy Interpretive Structural Model method so that results will be obtained which are then made conclusions.

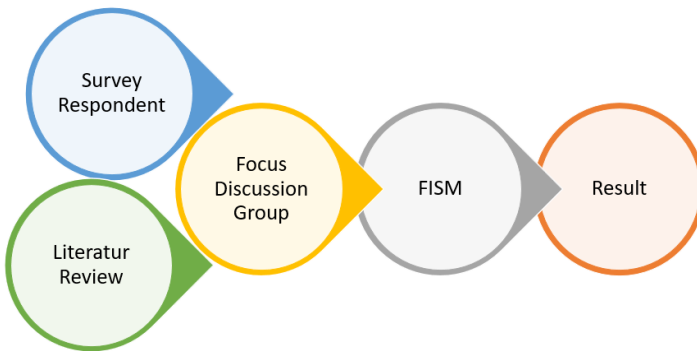


Fig. 1. Stages of Research

2.1 Data Types and Sources

The research that will be carried out has two types of data, namely secondary data and primary data. Secondary data is obtained through a literature study by collecting articles relevant to the GHRM theme through several journal data bases such as Scopus, ScienceDirect, Ebsco and Google Scholar, then studies are carried out related to their contents. The primary data was obtained through in-depth interviews (in dept interview experts) by involving several experts in the field of human resource management to obtain elements that can influence the success in the implementation of GHRM in

Higher Education. Another primary data is by organizing a Focus Group Discussion (FGD) activity to obtain fill data that will be processed using the Fuzzy Interpretive Structural Model (FISM) method.

2.2 Population and Sample

In this study, the population and samples are not like quantitative research in general which requires many respondents to provide input on the data to be processed, because this study uses the Fuzzy Interpretive Structural Model method. Some of the experts involved, about 3-5 people, can already be used to process or process data to produce the output of this study. The population in this study does not limit the area within a certain area or object only but opens up opportunities in a wider scope for the Indonesian territory, but the researcher limits people who understand management in human resources, for example HR consultants, HR assessors in LSP MSDM or heads of human resources divisions in an organization / institution.

2.3 Data Collection Methods

Because the elements that can determine the success of GHRM implementation in Higher Education have not existed so far, it is carried out in several stages, namely: literature study, in depth interview and Focus Group Discussion which involves several competent experts in the field of human resource management.

Literature Study is used to find and explore elements, then continued with in-depth interviews to complete the elements obtained, while Focus Group Discussion is used to confirm and discuss relationships and relationships between elements because in this study using the Fuzzy Interpretive Structural Model method.

This research took approximately 2 months to get the data and process it, and 1 month to make a report. So, the total time required is 3 months. The location does not limit the area within a certain area or object only but opens up opportunities in a wider scope for the territory of Indonesia, but researchers limit 3-5 people who understand management in human resources, for example HR consultants, HR assessors in LSP MSDM or heads of human resources divisions in an organization/institution.

2.4 Data Analysis Techniques

The data analysis used in this study uses the Fuzzy Interpretive Structural Model method which is used to identify and find out how the relationship between elements and the level or level of each element exists. Fuzzy Interpretive Structural Model analyzes the elements and visualizes them in graphic form of direct relationships between elements as well as their hierarchical levels.

3 Result and Discussion

3.1 Result

Table 1. Element Exploration through Literature Studies

Factor	Reference
Organizational Culture (E1)	[10], [7], [11], [12], [13], [14], [15], [16], [17], [8], [1], [18]
Environmental Awareness (E2)	[7], [19], [11], [12], [2], [15], [8], [1], [18]
Policy & Regulation (E3)	[20], [21], [7], [11], [12], [2], [15], [8], [1], [18]
Organizational Commitment & Discipline (E4)	[7], [22], [11], [12], [2], [23], [24], [25], [26], [27], [15], [8], [1], [18], [28], [29]
Awards & Sanctions (E5)	[7], [11], [12], [2], [15], [8], [1]
Organizational Culture (E6)	[10], [7], [11], [12], [2], [13], [14], [15], [16], [17], [8], [1], [18]
Environmental Awareness (E7)	[7], [19], [11], [12], [2], [15], [8], [1], [18]
Policy & Regulation (E8)	[20], [21], [7], [11], [12], [2], [15], [8], [1], [18]

Table 1 is the result of a literature review obtained from a database of internationally reputable journals such as Scopus, Science Direct, IEEE and Web of Science. Meanwhile, Table 2 is the result of a focus group discussion involving 3 experts who are very experienced in the field of human resource management. The classification related to the influence relationship between elements is shown in Table 3, where this classification is used as a reference for experts in determining through focus group discussions.

Table 2. Structural self-interaction matrix

	F1	F2	F3	F4	F5	F6	F7	F8
F1	-	K	K	L	L	K	L	K
F2	T	-	K	K	K	K	L	K
F3	T	T	-	K	K	K	L	K
F4	T	T	T	-	K	K	L	K
F5	K	T	T	T	-	K	L	K
F6	T	T	T	T	T	-	L	K
F7	K	K	K	K	K	K	-	T
F8	T	T	T	T	S	T	K	-

Table 3. Linguistic scale of influence

Criterion	Triangular Fuzzy Value	Notation
Strongly influence	(0.66; 1.00; 1.00)	K
Moderately influence	(0.33; 0.66; 1.00)	S
Weakly influence	(0; 0.33; 0.66)	L
No influence	(0; 0; 0.33)	T

Henceforth, the results of the focus group discussion involving the expert are in table 2, then adjusted according to the contents of Table 3, namely into the linguistic scale so as to produce Table 4.

Table 4. Final fuzzy reachability matrix with driving and dependence power

	E1	E2	E3	E4	E5	E6	E7	E8
E1	(1,1,1)	(0.66; 1.00; 1.00)	(0.66; 1.00; 1.00)	(0; 0.33; 0.66)	(0; 0.33; 0.66)	(0.66; 1.00; 1.00)	(0; 0.33; 0.66)	(0.66; 1.00; 1.00)
E2	(0; 0; 0.33)	(1,1,1)	(0.66; 1.00; 1.00)	(0.66; 1.00; 1.00)	(0.66; 1.00; 1.00)	(0.66; 1.00; 1.00)	(0; 0.33; 0.66)	(0.66; 1.00; 1.00)
E3	(0; 0; 0.33)	(0; 0; 0.33)	(1,1,1)	(0.66; 1.00; 1.00)	(0.66; 1.00; 1.00)	(0.33; 0.66; 1.00)	(0; 0.33; 0.66)	(0.66; 1.00; 1.00)
E4	(0; 0.33; 0.66)	(0; 0.33; 0.66)	(0; 0; 0.33)	(1,1,1)	(0.66; 1.00; 1.00)	(0.66; 1.00; 1.00)	(0; 0.33; 0.66)	(0.33; 0.66; 1.00)
E5	(0; 0.33; 0.66)	(0; 0.33; 0.66)	(0; 0.33; 0.66)	(0; 0; 0.33)	(1,1,1)	(0.66; 1.00; 1.00)	(0; 0.33; 0.66)	(0.66; 1.00; 1.00)
E6	(0; 0.33; 0.66)	(0; 0.33; 0.66)	(0.33; 0.66; 1.00)	(0; 0.33; 0.66)	(0; 0; 0.33)	(1,1,1)	(0; 0.33; 0.66)	(0.66; 1.00; 1.00)
E7	(0.33; 0.66; 1.00)	(0.33; 0.66; 1.00)	(0.33; 0.66; 1.00)	(0.33; 0.66; 1.00)	(0.33; 0.66; 1.00)	(0.33; 0.66; 1.00)	(1,1,1)	(0; 0; 0.33)
E8	(0; 0.33; 0.66)	(0; 0.33; 0.66)	(0; 0.33; 0.66)	(0.33; 0.66; 1.00)	(0; 0.33; 0.66)	(0; 0; 0.33)	(0; 0; 0.33)	(1,1,1)

Table 5. De-fuzzified initial reachability matrix

	E1	E2	E3	E4	E5	E6	E7	E8
E1	1	1	1	0	0	1	0	1
E2	0	1	1	1	1	1	0	1
E3	0	0	1	1	1	1	0	1
E4	0	0	0	1	1	1	0	1
E5	0	0	0	0	1	1	0	1
E6	0	0	1	0	0	1	0	1
E7	1	1	1	1	1	1	1	0
E8	0	0	0	1	0	0	0	1

Table 6. Final reachability matrix after transitivity checks

	E1	E2	E3	E4	E5	E6	E7	E8	DP	Level
E1	1	1	1	*1	*1	1	0	1	7	IV
E2	0	1	1	1	1	1	0	1	6	III
E3	0	0	1	1	1	1	0	1	5	II
E4	0	0	*1	1	1	1	0	1	5	II
E5	0	0	*1	0	*1	1	0	1	4	I
E6	0	0	1	1	*1	1	0	1	5	II
E7	1	1	1	1	1	1	1	1	7	IV
E8	0	0	*1	1	0	*1	0	1	4	I
Dependence	2	3	8	7	7	8	1	7		

The development of Table 4 produces Table 5 by changing it into digital values, namely 0 and 1, while Table 6 is the final result using the transformation matrix. The classification of elements which are divided into 4 areas from the final results of the reachability matrix using MICMAC is shown in Figure 2 which shows that it is divided into two areas. The independent area consists of elements E1, E2 and E7 while the linkage area contains elements E3, E4, E5, E6 and E8.

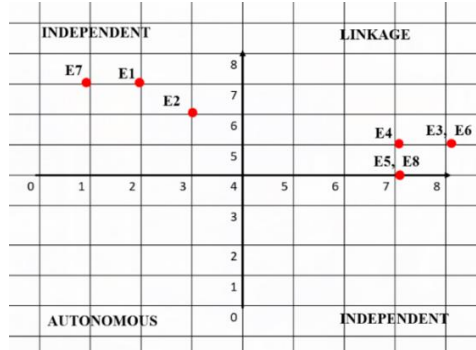


Fig. 2. Element classification of final reachability Matrix using MICMAC.

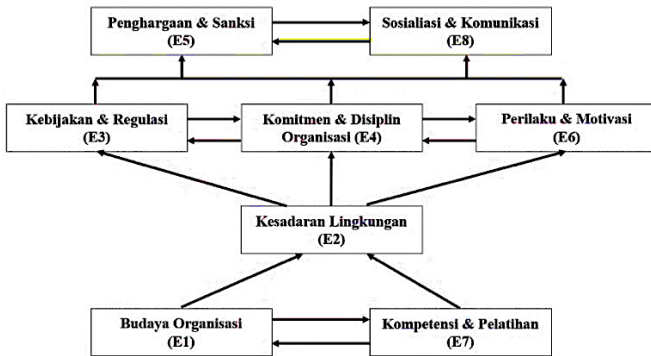


Fig. 3. Interpretive Structural Modelling

Level partitioning of the final reachability matrix where the study results provide information that the eight elements that have been processed using the fuzzy interpretive structural modeling method are divided into 4 levels, where level 1 consists of elements E5 and E8, Level 2 consists of elements E3, E4 and E6, for level 3 it consists of elements of E2 while at level 4 it consists of elements of E1 and E7 as shown in figure 3.

3.2 Discussion

This study also suggests that organizational culture (E1) and competence and training (E7) have a close relationship because they are at the same level (level 4). Environmental awareness (E2), which is at level 3, is influenced or formed at the previous level, namely organizational culture (E1) and competence and training (E7). Level 3 will push the level above it, namely level 2 which consists of policies and regulations (E3), organizational commitment and discipline (E4) as well as behavior and motivation (E6) where each element of level 2 has a close relationship. Furthermore, the last one is at

level 1 which consists of rewards and sanctions (E5) as well as outreach and communication (E8) formed from the previous level (Level 2), where the elements at level 1 have a close relationship.

4 Conclusion

The results of this study provide findings of eight important (key) elements in the implementation of GHRM in order to achieve success, the eight important elements are: organizational culture; environmental awareness; policies and regulations; organizational commitment and discipline; awards and sanctions; behavior and motivation; competency and training; as well as socialization and communication. Research also produces levels (levels) of 8 elements divided into 4 levels. The first level contains E5 and E8; the second level contains E3, E4 and E6, the third level contains E2 while the fourth level contains E1 and E7.

Other findings resulted in two classification areas, namely the linkage area and the independent area. There are 5 elements included in the linkage area, namely E3, E4, E5, E6 and E8. This means that the five elements have a driving force as well as a strong dependency, so that each of these elements will affect the other elements. The other three elements, namely elements E1, E2 and E7, are included in the independent area, this means that these three elements have high driving force but low dependency.

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