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Priorities human resource management using DEMATEL and ANP

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Abstract

The purpose of this paper is to prioritize green human resource (GHRM) indicators. Making Trial and Evaluation Laboratory (DEMATEL), Multi-criteria Technique and Fuzzy Network Analysis are applied in this study to prioritize the GHRM indicators. In order to achieve the paper goal is used the accepted GHRM model which has been published the past. Result is shown the high priority allocated to green training and internal criteria. In other word, management support and culture have more effect on green human resource management framework compare with external criteria. In addition; Sensitive analyses confirm the priorities which have been done.

Keywords: Green human resource management؛ Theme Analysis mixed method؛DEMATEL؛ ANP.

Introduction

Human activities have adversely influenced the environment and the depleting natural resources. Mehta and Chugan stated the effect on the stark realization of day-toonly individuals to go green but also organizations. They believe concern for environment has been increasing, therefore, the businesses are compelled to move towards sustainable goals and green policies[1]. In other word, according to the current condition the companies have to figure out solutions to reduce the ecological effects without considering the economic matters. Hence, to attain success and to facilitate attainment of profit, some researchers have recommended to environmental and social parameters along with economical and financial parameters[2,3].

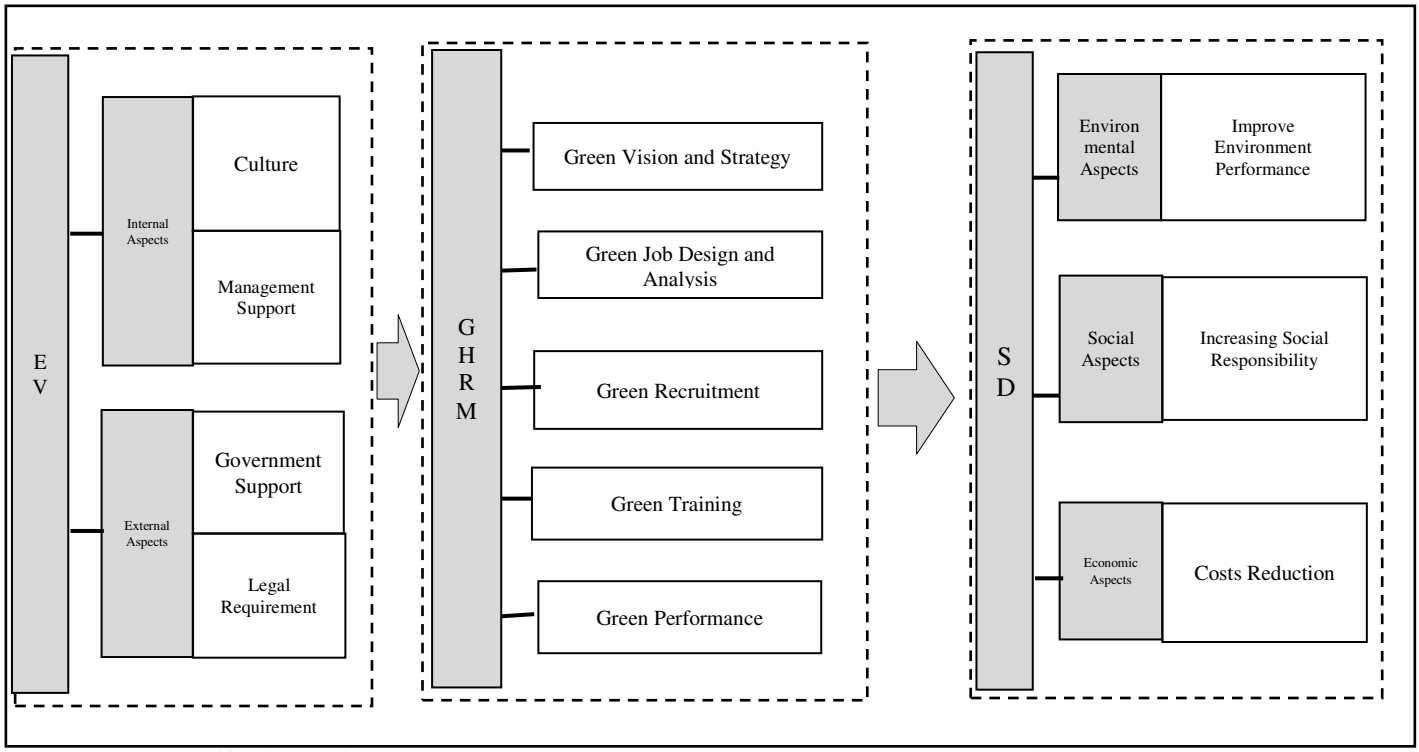
In Fact, they believe the companies should think over all aspects. Some opinion states that still the issue is not convenient with most specialists in the human resource environment although the sustainability topic is quick moving up on the priorities list of the big company's managers of world researcher state to implement any environmental plan a vast number of departments such as HR, Marketing, IT, Finance, and so on, involve putting forward an effective collaborative attempt and among them, the most significant participator department. Certainly, one of the significant parts of the solution to eliminate the environmental adventure is the Great partnership of stakeholder and companies[4]. On the other hand, the natural resource and energy combines: multiples aspects such as economies parameters, culture, political and the environment[5]. In addition, some researchers emphasize human resource plays the vital role for Sustainability of natural resources[6,7]. Therefore, it seems having the right skills are necessary to move towards sustainability goals in any community or human resources training organization. In this paper was used the accepted publish model which has been published before by the researcher.

Research Questions: After knowing the GHRM indicators, this paper has proposed the following questions in this research: Which GHRM indicators, organizations should better invest and consider?

Research literature: In this section is explained green human resource management.

Green human resource: Researchers have provided several definitions for GHRM. Some of them believe "investigation about GHRM is an inter-disciplinary and is drawn from organizational themes within strategic management"[8-11]. Some others believe "implementation GHRM practices bring about reduction negative environmental impacts or enhance positive environmental impacts of the organizations"[12]. In other word, the organization implants GHRM in search of preventing environmental problems due to positively influences environment in the long run. Mandip provided a Comprehensive definition for GHRM: "Green human resources refer to using every employee touch point/interface to promote sustainable practices and increase employee awareness and commitments on the issues of sustainability. It involves undertaking environment-friendly HR initiatives resulting in greater efficiencies, lower costs and better employee engagement and retention which in turn, help organizations to reduce employee carbon footprints by the likes of electronic filing, car-sharing, job-sharing, teleconferencing and virtual interviews, recycling, telecommuting, online training, energy-efficient office spaces etc"[13].

Human resources management models: GHRM is a new issue for organization and recently it investigation has been increasing. In the research, has been used the accepted model which published before[14]. The conceptual model for this paper has been shown in the Figure-1.



EV: Effective Variables, GHRM: Green Human Resource Management, SD: Sustainable Development.
Figure-1: Conceptual framework[14].

Methodology

In order to achieve the study aim, in this article, using DEMATEL for finding the cause and effect between GHRM variables and indicators in search of prioritizing them using ANP with super decision software.

DEMATEL is abbreviation of decision making trial and evaluation laboratory which is known as a significant method for the exploration of cause-effect chain a complex system' components. It deals with evaluating interdependent relationships among variables and recognizing the critical ones through a visual structural model. Over the recent decade, many researches have been studied on the method of DEMATEL and several different variants have been put forward in the literature[15,16].

By using the analytic network process ANP, it is able to benchmark the feedback and dependencies between parameters of the decision-making, and compute more stringent local and global priorities of alternatives and weights of criteria[17].

Results and discussion

First, was provided the abbreviation for variables, was drawn the 4*4 matrix for internal and external aspects and also 5*5 matrix for GHRM indicators. After this stage the experts did the Paired comparisons between variables of model. The table of abbreviation and Scoring range has been shown in the Table-1, 2.

Table-1: Abbreviation.

GHRM			Internal
G1	Green Vision and Strategy		External
G2	Green Recruitment	I1	Management Support
G3	Green Job Design and Analysis	I2	Culture
G4	Green Training	E1	Government Support
G5	Green Performance	E2	Legal Requirement

Table-2: Scoring category.

Very effective	high impact	Medium impact	Low impact	Effect less
4	3	2	1	0

After data collection, were obtained causal and effective nodes. The result of calculation has been shown in Table-3, 4. For example, in the Table-3, I1 has more effect on I2 compare with I1 effect on E2.

Pairwise comparisons on a cluster level. The aim of this phase is to transmute the unweighted matrix into the weighted super matrix. For this, we have to do the comparisons between

variables. The result of DEMATEL comparisons has been shown in the Table-3 and 4 and also in Figure-2, 3.

As a result of Table-3 and Figure-2: I1 has more Interaction to other variables. E2 plays role as a cause and is most effective variable. On the other hand I2 is most impressionable and plays role as an effect.

Table-4 and Figure-3 give the following result: G1 has more Interaction to other variables and plays roles as a cause and is most effective variable.

After finding the Interactive nodes, cause and effect were applied on the conceptual model. The final model has been shown in the Figure-4.

Table-3: Result of DEMATEL for External and Internal Variables.

M*{(I-M)-1}							
	I 1	I 2	E 1	E 2	R	R+J	R-J
I 1	0.749	1.157	0.607	0.250	2.763	6.18281	-0.65768
I 2	0.500	0.331	0.173	0.071	1.075	4.49017	-2.34013
E 1	1.071	0.851	0.371	0.153	2.446	4.40859	0.48434
E 2	1.101	1.076	0.811	0.157	3.145	3.77640	2.51347
J	3.420	3.415	1.962	0.631			

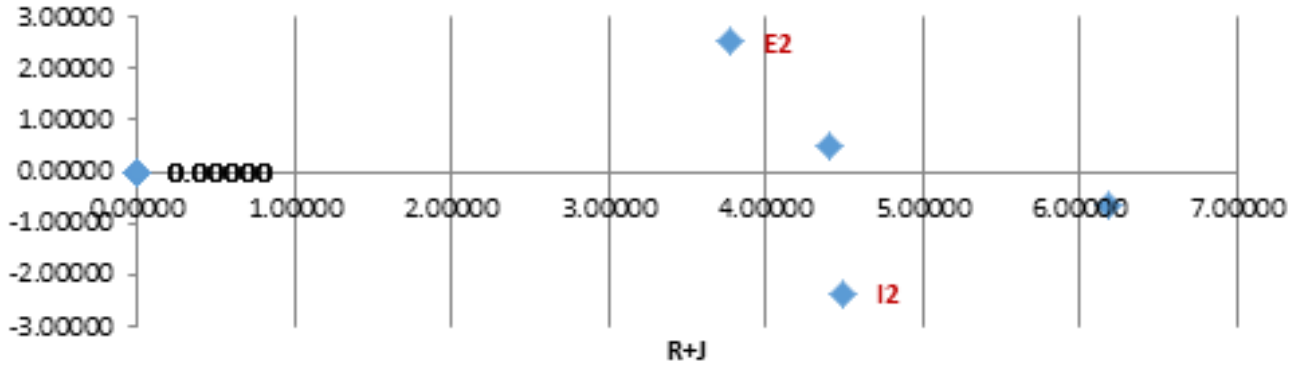


Figure-2: Result of DEMATEL for External and Internal Variables.

Table-4: Result of DEMATEL for GHRM indicators.

	M*{(I-M)-1}							
	G1	G2	G3	G4	G5	R	R+J	R-J
G1	0.000	0.278	0.333	0.500	0.296	1.407	1.40741	1.40741
G2	0.000	0.000	0.000	0.000	0.167	0.167	0.77778	-0.44444
G3	0.000	0.333	0.000	0.000	0.056	0.389	0.72222	0.05556
G4	0.000	0.000	0.000	0.000	0.500	0.500	1.00000	0.00000
G5	0.000	0.000	0.000	0.000	0.000	0.000	1.01852	-1.01852
J	0.000	0.611	0.333	0.500	1.019			

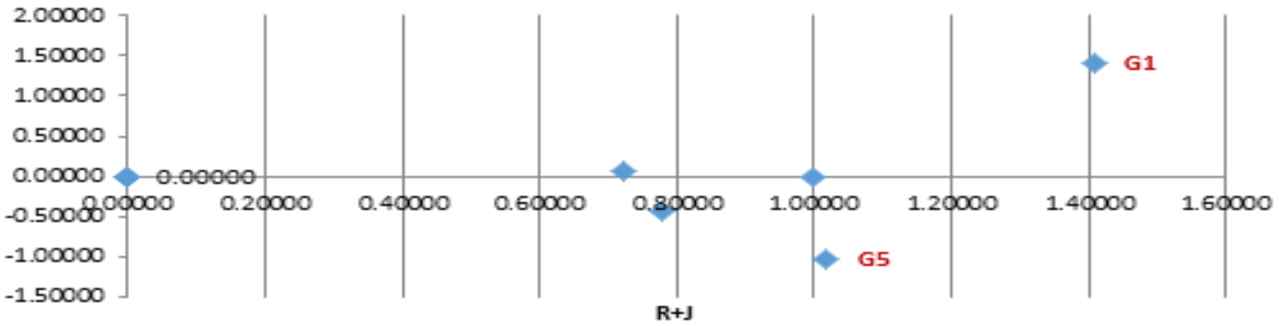


Figure-3: Result of DEMATEL for GHRM indicators.

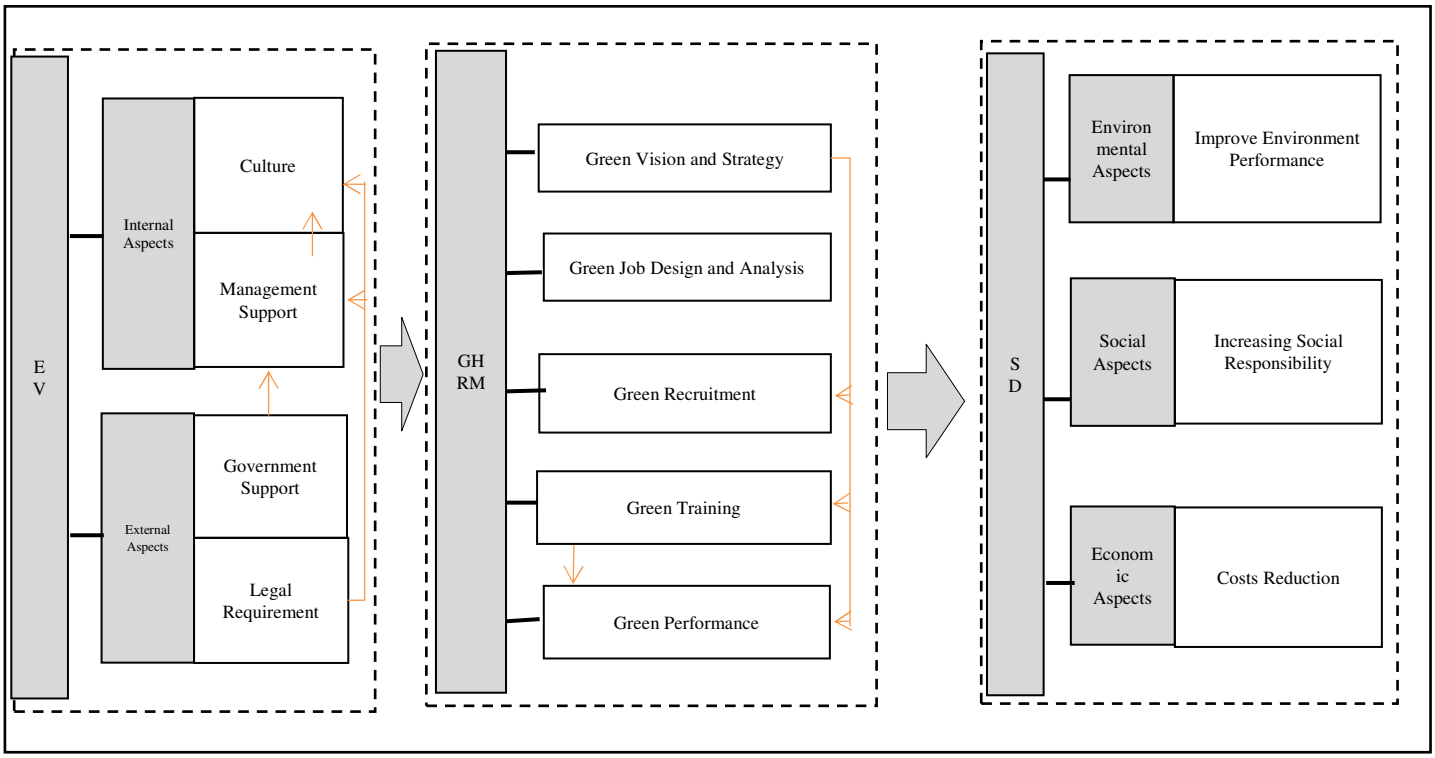


Figure-4: Final Conceptual framework by considering cause and effect.

After define the cause and effect nodes, decision making provided for prioritize the variables by using ANP and Super-decision software. Paired comparisons was scored by "SAATI" scale. Super decision software model shown in the Figure-5.

Result of network analysis and Prioritizing variables have been shown in the Table-5. Incompatibility rate have towards suitable number and it is less than 0,1 in all of tables. Is brought about reliability of paired comparisons. And finally, the variables prioritize are shown in the Figure-6.

Sensitivity analysis: the survey of how the uncertainty in the output of a mathematical model is called sensitivity analysis which is able to separated and assigned to different sources of uncertainty in its inputs[18].

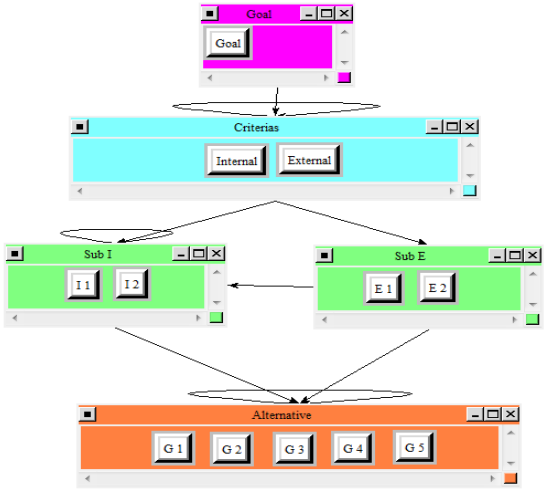


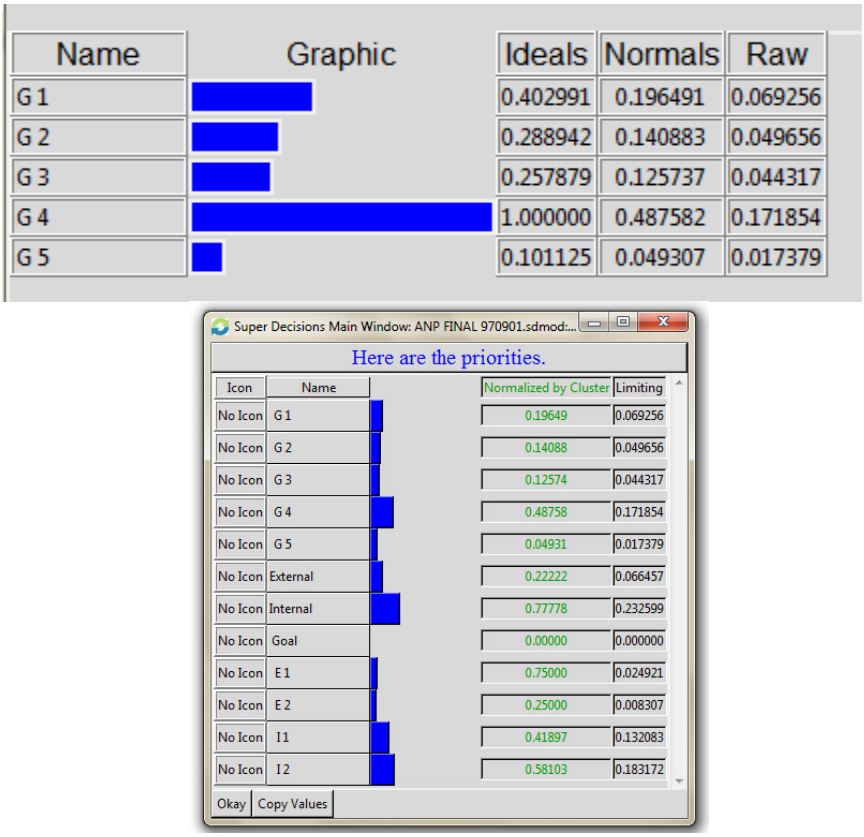
Figure-5: Superdecision software model.

Sensitivity analysis of external variables: Based on the sensitivity of external variables the ranking of options is as follows: G4> G1> G2> G3> G5. After changing the weight of the external criterion the ranking order will be as follows: G4> G1>G3>G2>G5. The rank of G4 in all of weight changing is higher than others. It shows that G4 (Training) is a decisive factor for GHRM implementation. In other word, external weight changing don't has significant effect on variables. Figure-7 shows the External weight changing and impact on this on the GHRM indicators ranking.

Table-5: Fuzzy calculations of software output.

Normalized weight of the main criteria relative to the target		
Goal		Normalized weight
External		0.250
Internal		0.750
Incompatibility rate		0

Normalized weight of sub-criteria relative to criteria				
External	Normalized weight		Internal	Normalized weight
E 1	0.75		I1	0.5
E 2	0.25		I1	0.5
Incompatibility rate	0		Incompatibility rate	0
Normalized weight of GHRM indicators relative to sub-criteria				
E1	Normalized weight		E2	Normalized weight
G 1	0.5064		G 1	0.4722
G 2	0.0693		G 2	0.0666
G 3	0.1256		G 3	0.1464
G 4	0.2431		G 4	0.2617
G 5	0.0555		G 5	0.0531
Incompatibility rate	0.0666		Incompatibility rate	0.0693
I1			I2	
G 1	0.4107		G 1	0.1849
G 2	0.0654		G 2	0.2413
G 3	0.1335		G 3	0.0874
G 4	0.2993		G 4	0.4294
G 5	0.0911		G 5	0.0570
Incompatibility rate	0.0260		Incompatibility rate	0.0353
Normalized weight of network analysis relationships				
E1	Normalized weight		G1	Normalized weight
I 1	0.800		G 3	0.25
I 2	0.200		G 4	0.75
Incompatibility rate	0		Incompatibility rate	0



Name	Graphic	Ideals	Normals	Raw
G 1		0.402991	0.196491	0.069256
G 2		0.288942	0.140883	0.049656
G 3		0.257879	0.125737	0.044317
G 4		1.000000	0.487582	0.171854
G 5		0.101125	0.049307	0.017379

Icon	Name	Normalized by Cluster	Limiting
No Icon	G 1	0.19649	0.069256
No Icon	G 2	0.14088	0.049656
No Icon	G 3	0.12574	0.044317
No Icon	G 4	0.48758	0.171854
No Icon	G 5	0.04931	0.017379
No Icon	External	0.22222	0.066457
No Icon	Internal	0.77778	0.232599
No Icon	Goal	0.00000	0.000000
No Icon	E 1	0.75000	0.024921
No Icon	E 2	0.25000	0.008307
No Icon	I 1	0.41897	0.132083
No Icon	I 2	0.58103	0.183172

Figure-6: variables prioritize.

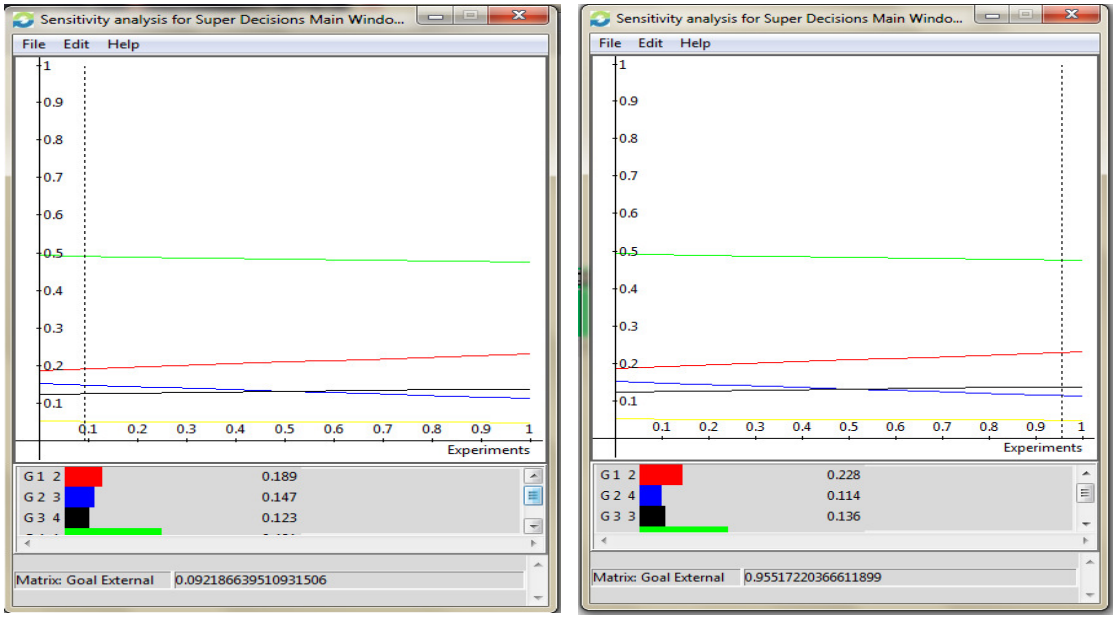


Figure-7: Sensitivity analysis of external variables.

Sensitivity analysis of internal variables: Based on the sensitivity of internal variables the ranking of options is as follows: G4> G1> G3> G2> G5. After changing the weight of the internal criterion the ranking order will be as follows: G4> G1>G2>G3>G5. The rank of G4 in all of weight changing is higher than others. It shows that G4 (Training) is a decisive factor for GHRM implementation. In other word, internal weight changing don't has significant effect on variables. Figure-8 shows the Internal weight changing and impact on this on the GHRM indicators ranking.

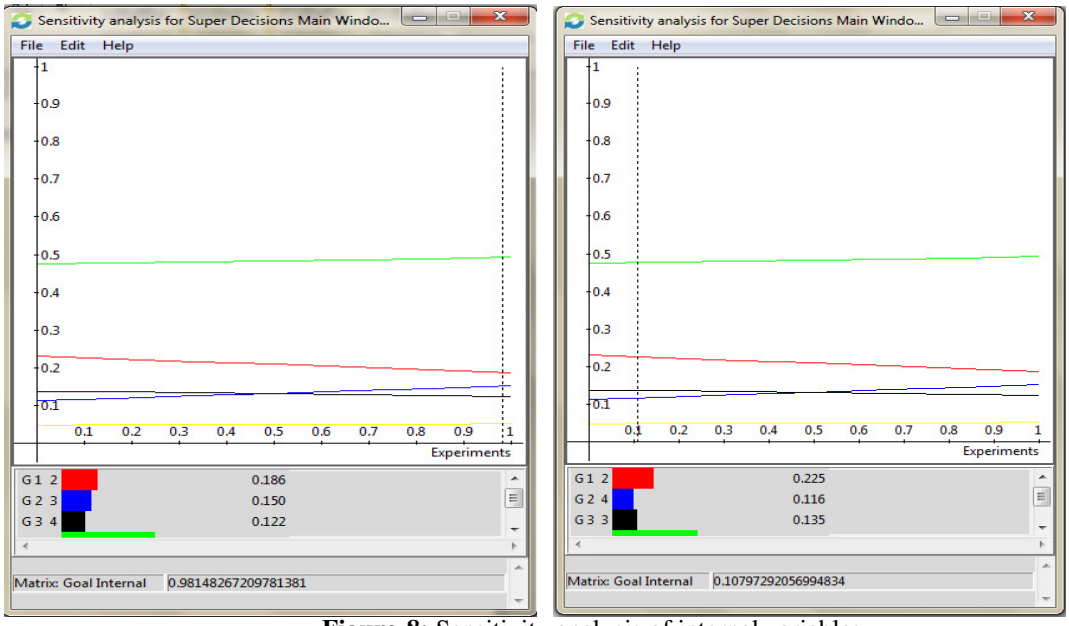


Figure-8: Sensitivity analysis of internal variables.

Conclusion

The aim of this paper was identify and priority the green human resource management indicators or variables. For this purpose the researchers used the GHRM conceptual model which they had been studied before and publish it last year by this journal.

Prioritizing variables and Identifying the cause and effect variables were the purpose of this article. In order to researcher find the goals by using the DEMATEL and ANP Method.

The result of calculation confirms that: i. The internal variables has significant role for GHRM implementation, ii. Training indicator is most important for leading the company towards GHRM, iii. Companies should be encouraged towards planning the training course by government support, iv. Lack of goals and strategic work as a deterrent for GHRM implementation.

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