

# Unveiling the Factors of Green Human Resources in Manufacturing Industries

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## Abstract

The severe consequences of climate change have left many unanswered questions about the environmental performance of businesses. Appropriate measures must be taken to tackle the problems conquered due to climate change. This study supports exploring the factors needed to get the Employees Environmental Performance (EEP). It includes Green Human Resources (GHR), Green Creativity (GC) and Proactive Environmental Management (PEM). The relationship among the variables was explored in the existing literature. This study aims to test the relationship between GHR and GC. Further, it also examined the mediating role of GC and moderating role of PEM. For this purpose, data were collected from employees of manufacturing companies (automobiles, food processing, chemicals, textiles, machinery and equipment) in India. More specifically, ISO 14001-certified companies were selected. Among the different institutions, 35 are manufacturing in India. Out of 35, 24 companies agreed to conduct a survey in their company. Totally 5376 employees were considered as a population for the study. With 95% confidence interval, 400 samples were selected, and a questionnaire was distributed among them using simple random sampling. 305 (76.25%) cases finalized for further analysis. The collected data analyzed using PLS-SEM with R software. The results highlighted the essential role of GHR practices in the manufacturing industry to enhance EEP since GHR positively influences EEP. Moreover, it was found that GC partially mediates the relationship between GHR and EEP. It indicates the importance of GC's existence in increasing EEP through GHR. Finally, it was also found that PEM moderates the relationship between GHR and EEP. It suggested the role of pro-environmental management and their active pace in improving EEP. Managerial implications and future scope were discussed in this study.

## Keywords

Green human resources; Green creativity; Proactive environmental management; Environmental performance; Environmental practices.

## Introduction

Companies' reckless attitude towards environmental issues and usage of natural resources adds severe ecological problems (Robertson & Barling, 2013). Therefore, organizations must give more attention

to pro-environmental policies, which encourage green behavior among employees. Stakeholders also insist the organization work on operations considering environmental issues, focusing on environmental practices (Masri & Jaaron, 2017). Interestingly, adapting pro-environmental policies and practices becomes essential for an organization to gain a reputation and achieve a competitive advantage (Tang et al., 2018). Thus, researchers and academicians are more interested in green approaches (Ahmed et al., 2021).

According to Mandip (2012), the human resource department plays a significant role in creating and changing organizational culture, designing structure,

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making policies, and promoting green behavior to achieve sustainable goals. Moreover, the human resource department is responsible for developing sustainable development in almost all the processes of the organization (Kot, 2023). Studies highlight this would be highly important for manufacturing companies of the nature of Supply Chain Management (SCM) (Hariharasudan et al., 2021; Muangmee et al., 2022).

Hence it was advised that HR practices have to move with green approaches and movements to ensure all manufacturing business processes (Ren et al., 2018). In such a manner, companies generally propose the concept of Green Human Resources (GHR). GHR practices aligning with an HR practice include recruiting, hiring, training, compensating and rewarding with environmentally concerned (Tang et al., 2018).

Green Human Resources (GHR) refer to policies and practices that promote pro-environmental behavior among employees and encourage sustainable usage of organizational resources, and it was proposed based on sustainable development (Opatha & Arulrajah, 2014). Sustainable development management has become a crucial element of corporate-level strategy. When aligned with some information system, it helps achieve the desired sustainable outcome (Rahiman et al., 2021). Moreover, sustainable development management was base for adapting Environmental Management System (EMS), which is compulsory to get certified with ISO14001 (Rayner & Morgan, 2018). EMS is a documentation procedure of practices and policies that have environmental impacts. When lineup HRM practices with EMS procedures would be a path for numerous environmentally friendly activities, such as GHR and some allied activities of creating Green Culture (GC) (Ren et al., 2018); therefore, it is important to know and study the extent of GHR practices (Saeed et al., 2019). Accordingly, it is essential to study GHR further and its impacts on Employee Environmental Performance (EEP) with a new initiative like Green Creativity (GC) (Ren et al., 2018).

Green Creativity is defined as “the process of developing new ideas about green products, green services, green processes or green practices that are judged to be original, novel and useful” (Chen & Chang, 2013). For companies trying to achieve sustainable goals, the employees should step ahead to generate, execute and use the benefit of creative ideas about managing the environment. This means that companies heavily depend on the employees’ creative environmental behavior to be a sustainable and developed organization (Ren et al., 2018). It is very important that the employees must have emotional connect and commitment towards organization to achieve sustain-

able goals of the organizations (Rahiman et al., 2020). Further, collective creativity must be processed (Ciachorowski & Lis, 2022). But still, any kind of employee behavior largely depends on the company’s culture and management intention (Dumont & Jie Shen, 2016). Therefore, studying GHR with GC on the EEP, it is important to study the role of Proactive Environment Management (PEM) in the organization (Norton et al., 2017). Employees’ environmental performance (EEP) is the result of employees’ green work-related activities aligning with the sustainable development of the organization’s goals (Shen et al., 2018).

Proactive Environmental Management (PEM) is the active participation of organization towards generating, designing, implementing and practicing in every function with environmental concern (Berry & Randinelli, 1998). Top management must design a green strategy at every level of the organization (Jackson, 2018); for instance, green purchasing, encouraging green marketing approaches, etc. In simple, organization understand their role towards environmental responsibility and act accordingly in all the process (Ciarniene et al., 2020; Kalamas et al., 2014).

The present study is designed to fill the gap in the effects of GHR practices on the EEP with the GC in a PEM at the manufacturing companies in the Indian context. In this way, the present study explores the influential role of GHR in creating and practicing GC and elaborates on the impact on EEP in the Indian context. Whether GC explains the relationship between GHR and EEP as mediators were analyzed; further, this study highlights the importance of PEM by adding it to this study as a moderator on the relationship between GHR and EEP.

## Literature review and hypothesis development

### Green Human Resources (GHR) practices

The GHR is an interdisciplinary concept derived from strategic management, performance management, organizational culture and the concept of training and development (Haddock-Millar et al., 2016). GHR is a tool to strategically promote sustainable performance using sustainable processes (Saeed et al., 2019). At present, the priority of companies has shifted towards environmental production; therefore, it is important for the organization to think, lead and design strategies at the corporate level (Cohen et al., 2012). Especially, HR needs a strong policy force from the top-level management because HR has a position to implement and con-

tribute pro-environmental behavior to each individual in the organization (Boudreau & Ramstad, 2005). Hence, it is possible to assess any environmental issues by proactive, positive and behavioral approaches in an organization (Ruepert et al., 2016). Consequently, companies must implement GHR system into the practices to promote pro-environmental behavior and contribute to green culture (Zaid et al., 2018). Those practices include recruitment, selection, training, compensating, rewarding, creating engagement and culture and motivating with environmental beliefs and values (Renwick et al., 2016). In this line, numerous studies contribute more to the existing idea of green literature and its associates (Saeed et al., 2019). For instance, Yusliza et al. (2021) investigated the impact of GHR on environmental performance. The authors researched the causes of GHR practices on pro-environmental behavior with the mediating effect of pro-environmental psychological capital and the moderating effect of environmental values (Saeed et al., 2019). All the above studies highlighted the impotence of GHR. However, many studies investigated the limited scope of GHR perspective (Dumont & Jie Shen, 2016). Some authors insisted on the importance of academic attention to GHR practices to explore different perspectives (Chams & García-Blandón, 2019). Kim et al. (2019) suggested investigating the full strength of GHR in the organizational context and outcomes that include both green and non-green behavior and relative thoughts.

Interestingly, strategic approaches promote more essential skills, knowledge, behavior and changes in employees' influence on organizational performance. In this way, it can be concluded that GHR practices are the strategic approach (Haddock-Millar et al., 2016; Dumont & Jie Shen, 2016; Paillé et al., 2014).

### **Green Human Resources (GHR) practices in India**

Green Human Resource Management and its functions are quite a new concept in India. However, it is a wide accepting practice in India (Arora & Kaul, 2020). The prevalence of practices is high in different industries in India. Some industries, like manufacturing, automobiles, food processing, etc., practice the GHR functions, whereas industries like banking/finance and engineering/technology sector are aware of GHR practices. Some industries, like Information Technology (IT), practice few functions of GHR, while industries like manufacturing use most of the functions of GHR (Chaudhary, 2019). Further, some studies highlighted that GHR practices ensure considerable changes in the employees' green behavior

(Mishra, 2017). This study focused on GHR practices and their substantial outcomes in Indian industries.

### **Green Human Resources (GHR) and Employee Environmental Performance (EEP)**

Paillé et al. (2014) stated the importance of incorporating GHR practices to ensure employees' participation in the organizational environmental sustainability goals. Implementing GHR practices has become a structured system that helps attain EEP (Yusliza et al., 2021; Nuanphromsakul et al., 2022). Moreover, GHR practices motivate to change into green operations, including reducing waste, utilizing appropriate utilization of natural resources and achieving competitive efficiency (Zaid et al., 2018). Further studies portray the significant role of GHR in improving the financial performance of an organization (Haddock-Millar et al., 2016). Hence, using GHR is beneficial for instigating overall employee environmental performance (Arulrajah et al., 2016). In addition, those practices are beneficial to retain employees and one among the cause for enriching the company's brand name (Awan et al., 2021). However, investigating how GHR influences employee environmental performance was untouched (Ren et al., 2018). This study analyzes how and by which GHR influences Employee environmental performance.

H1: Green Human Resource practices are positively associated with Employees Environmental Performance.

### **Green Human Resources (GHR) and Green Creativity (GC)**

Various literature supports the argument that HR policies influence employees' behavior and attitude, through which companies generally achieve expected performance (Gilal et al., 2019). Hence, HR policies must be reviewed, and periodic changes are inevitable. Companies must change HR policies with serious concern, including pro-environmental practices (Shen et al., 2018). Kramar (2014) mentioned that GHR practices, such as recruiting and selecting green concerned people, train the business operation to promote sustainable performance and green rewards. However, it does benefit the company based on its importance in the implementation. Companies must shift from macro to micro levels (Teixeira et al., 2012). Companies using individual GHR approaches may produce significant outcomes such as Green Creativity (GC) (Al-Ghazali & Afsar, 2020).

Green Creativity is a continuous process in which employees can think and develop new and innovative ideas for green products, processes, and prac-

tices (Chen & Chang, 2013). Several authors believe that green creativity has a significant role in ensuring sustainable development for organizations (Provanek et al., 2017). As Al-Ghazali & Afsar (2020) suggested, GHR practices include testing the candidate's green concerns while selection, environmental protection and development-related training and rewarding green behavior of employees will certainly promote green behavior among the employees. The organization also intends to design green culture, nurture green behavior, create distinctive ways of approaching environmental issues and magnify Green Creativity (GC) (Ahmad et al., 2019). Thus, it is believed that GHR and top-management interest stimulates creative behavior, i.e., Green Creativity.

H2: Green Human Resource practices positively influence Green Creativity

### **Green Creativity (GC) and Employee Environmental Performance (EEP)**

Green Creativity (GC) influences organizational performance in terms of economic and environmental context. It helps to change the organization's entire system (Song et al., 2020). Many authors suggested that it is important to inculcate a unique culture for generating creative ideas to find solutions for organizational issues and manage the system effectively (Dangelico et al., 2017). GC encourages organizations to adopt pro-environmental behavior among the employees, such as green purchasing and green processes, including the use of appropriate level natural resources, etc., in a unique way (Omarova & Jo, 2022). Moreover, it needs to change and modify according to the requirement of the condition of the environment and related issues (Darvishmotevali et al., 2020). Creative solutions provide profitable outcomes to organizations and help enhance societal self-image (Chen & Chang, 2013). Therefore, companies' top-level management must focus on the culture of GC to ensure the environmental performance of employees. Moreover, this culture creates an ambience where employees' commitment and performance towards the environment can be enhanced (Song et al., 2020). Hence, it is hypothesized as follows:

H3: Green Creativity positively influences Employees Environmental Performance.

### **Green creativity as a mediator**

Many researchers stressed that environmental management enhances creative green culture to motivate employees' green creativity in the organization (Darvishmotevali et al., 2020). Further, this green cre-

ativity stimulates the employees to think distinctively, which help to resolve environmental issues related to organizational process (Tuan, 2020). It also helps to enhance the organization's environmental performance (Al-Ghazali & Afsar, 2020). Thus, as quoted in past studies, GHR practices formulated by the green policies, which are pronounced and tabled by top management, instigate green creative culture among the employees to enhance Employees Environmental Performance (EEP) (Ahmad, 2015). In conjunction with the above arguments, GC fixed as a mediator between GHR and EEP and framed the hypothesis as follows:

H4: Green Creativity mediates the relationship between Green Human Resources and Employees Environmental Performance.

### **Proactive Environmental Management (PEM) as a moderator**

Proactive Environmental Management (PEM) is observed as an organization's voluntary practice and initiative toward environmental performance over the minimum level of legal compliance (Arago, 2019; Gonza, 2005). Studies mentioned various proactive management practices, including innovative processes, environmental protection systems, etc. (Yang, 2019). However, some studies argued that PEM is defined as a range of processes from drafting a mission statement to delivering the products or services to the customers voluntarily (Mehmood et al., 2021). Wu (2010) argued that these practices not only help to prevent harmful environmental practices but also motivate employees to track the new way to deal with the environment. But to achieve this, employees need proper HR practices such as training, which can be possible through GHR policies (Ali et al., 2021). It is understood that to accomplish sustainable organizational goals, behavioral changes against environmental protection by way of GHR policies need to be framed by proactive management (Young et al., 2015). Hence, it is proposed that GHR will have a significant impact on EEP while at higher PEM and when at a lower level of PEM, GHR will have less impact on EEP as follows.

### **Conceptual framework**

#### **Model with mediation**

The proposed model was framed, depicting both mediation and moderation (see Figure 1) effects of the respective variables. Figure 2 represents the mediation effect, including total, direct, and indirect effects.

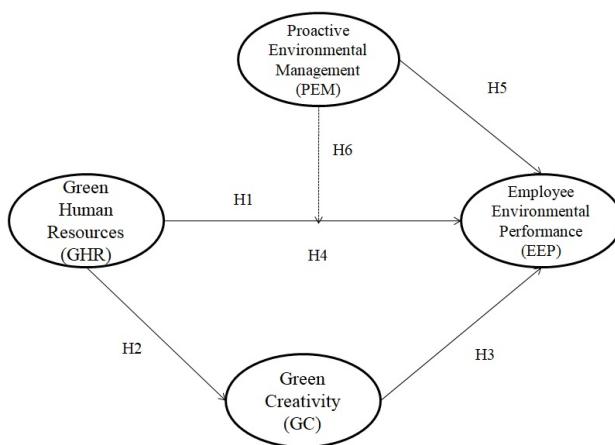


Fig. 1. Conceptual Model of Research

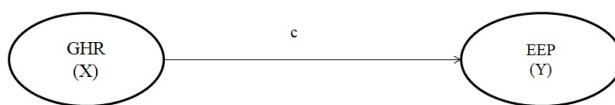


Fig. 2. Total effect of GHR on EEP excluding GC

Note:  $c$  indicates the strength of total effect between Green Human Resources (GHR) and Employee Environmental Performance (EEP) without mediating variable.

$X$  is an independent variable, GHR, and  $Y$  is a dependent variable, EEP

H5: Proactive Environmental Management positively influences Employees Environmental Performance.

H6: Proactive Environmental Management moderates the relationship between Green Human Resources and Employees Environmental Performance.

Underlying with the above discussion, this study is designed to analyze the influence of GHR on EEP with the importance of GC and the role of PEM as hypothesized as follows.

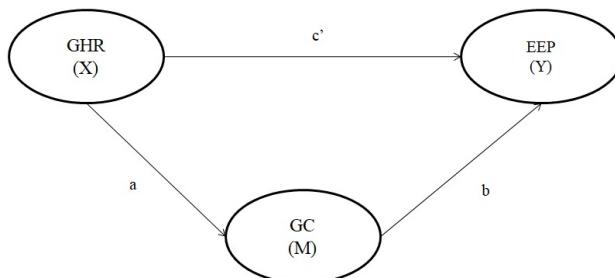


Fig. 3. Effect of GHR on EEP with the presence of GC

Note:  $c'$  is a strength of the direct effect of Green Human Resources (GHR) and Employee Environmental

Performance (EEP) in the presence of mediating variable Green Creativity (GC), and  $a$  and  $b$  represent the strength of indirect effect between Green Human Resources (GHR) and Employee Environmental Performance (EEP) through Creativity (GC).

$X$  is an independent variable – GHR,  $Y$  is a dependent variable – EEP, and  $M$  is a mediating variable – GC.

Moreover, the total effect is calculated as  $c = c' + (a \cdot b)$ .

## Moderation model

Figure 4 shows the moderation effect of the study.

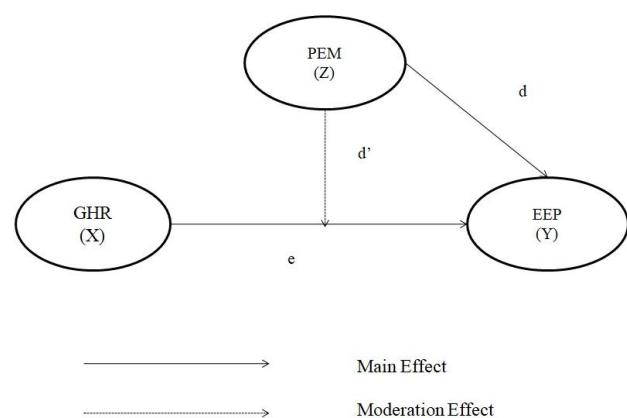


Fig. 4. Proposed relationship between GHR and EEP with the moderating effect of PEM

Note:  $e$  denotes the main effect,  $d$  denotes the direct relationship between Proactive Environmental Management (PEM) and Employee Environmental Performance (EEP), and  $d'$  denotes the moderate effect of Proactive Environmental Management (PEM) on the relationship between Green Human Resources (GHR) and Employee Environmental Performance (EEP).

From Figure 4,  $X$  is the independent variable GHR,  $Y$  is the dependent variable EEP, and  $Z$  is the moderator variable PEM.

The Main effect is calculated using the formula as follows

$$Y = a + e \cdot X + d \cdot Z$$

The interaction effect is calculated using the equation proposed by (Hamdollah & Baghaei, 2016) as follows:

$$Y = a + (e + d' \cdot M) \cdot X + d \cdot M$$

## Research methods

### Samples and procedure

The study was analyzed using data collected from employees working in different types of manufacturing industries in India. They were from automobiles, food processing, chemicals, textiles, machinery and equipment used for data collection. To decide on relevant samples for this study, two-stage approaches were administered. In stage one, the researchers prepared an e-mail message containing information about the purpose and scope of the study. In addition, the relevance of this study was mentioned in this e-mail. The e-mail messages were sent to the head of the organization to seek approval from them for conducting a survey. In addition, they were contacted by telephone and explained the importance of this study to them. The ISO 14001-certified organizations were selected for the study. Adopting Environmental Management System (EMS) to certify ISO 14001 is mandatory. So, it is believed that companies with EMS embrace green practices in all business processes (Eltayeb et al., 2011). Moreover, some studies suggested that GHR practices are the outcome of EMS and HRM practices in the organization (González-Sánchez et al., 2018). This is base for choosing organizations for this study. 140 companies from various sectors were certified with ISO 14001, and out of 140, 35 companies are manufacturing companies (Central Pollution Control Board, 2021). Out of 35, 24 companies agreed to conduct the survey. Other companies felt that GHR practices were trade mark activity of those companies, and they refused to disclose them to any third parties.

In stage two, employee details were collected from heads of those 24 organizations with the assurance that the details of employees were used only for research purposes and not to disclose the information. The researchers planned to collect the sample of 400 employees using simple random sampling from the population of 5376 employees with 95% confidence interval, 5% margin of error and 50% population proportion. For calculating sample size, the guidelines experienced by Khaskheli et al. (2020) were adopted. As mentioned in the article, “the sample of 50 was believed as inferior, 51 to 300 as good, 301 to 500 as very good and 501 to 1000 as excellent”. This study was categorized as “Very Good” as part of the sample size. The authors requested the head of the organizations to appoint one single point of contact person (Research Assistant) regarding data collection from every company. Companies understood the importance of this request and appointed one person for the pur-

pose of data collection. In some companies, the heads themselves act as research assistants. The prepared research instrument was circulated among 400 employees through the research assistant, and telephonic interaction was made with employees to explain the concepts of the research work at the allocated time by the heads of the organization. The total data collection duration was 74 days (from July 2022 to September 2022). Totally, 400 questionnaires were distributed, and 357 (89.25%) responses were returned. Out of 357 responses, 305 (85.4%) were taken for further analysis, and the remaining 52 (14.6%) were removed during the data purification process. Data purification includes finding missing values and outliers (Kwak & Kim, 2017).

### Measurement

The GHR construct was measured using five items derived from the CSR HRM scale developed by (Shen & Benson, 2016). Already this scale measured GHR in the study by (Kim et al., 2019). The sample items are “My organization provides adequate training to promote environmental management as a core organizational value”, “My organization relates employee’s eco-friendly behavior to rewards and compensation”, and “My organization encourages employees to provide suggestions on environmental improvement”. The construct was measured using 7 points Likert scale, which ranges from 1 Strongly Disagree to 7 Strongly Agree.

The GC construct was measured using six items scale developed by (Chen & Chang, 2013). The sample items are “The members of the organization suggest new ways to achieve environmental goals”, “The members of the organization promote and champion new green ideas to others”, and “The members of the organization would rethink new green ideas”. As with the previous GHR construct, GC was measured by 7 points Likert scale, which ranges from 1 Strongly Disagree to 7 Strongly Agree.

The 5 items scale was used to measure the PEM developed by (O'Donohue & Torugsa, 2016). The sample items are “Our Company will conduct natural environment audit periodically”, “Our Company will conduct a program of waste recycling/reuse”, and “Our Company will show interest towards increasing energy efficiency”. As used for previous scales, PEM scales used 7 points Likert scale, which ranges from 1 Strongly Disagree to 7 Strongly Agree.

The EEP construct was measured using a five-item scale developed by (Chow & Chen, 2012). The sample items are “Our Company reduces wastes and emissions from operations”, “Our Company reduces the risk of environmental accidents, spills, and releases”, and

"Our Company reduces purchases of non-renewable materials, chemicals, and components". EEP construct also used 7 points Likert scale ranging from 1 Strongly Disagree to 7 Strongly Agree.

## Analysis and results

### Demographic analysis

In this study, analysis was performed for the data collected from various demographic profiles. These are categorized based on gender, age, educational qualification, job position and work experience nature of responders.

Regarding gender, 64.9% (198) participants were males out of 305 respondents. 35.1% (107) were females. It was suggested that the voice of males were reflected in the study. Most of the employees (147) belong to the age category of 36 to 40 years. Their experience with GHR practices was highly reflected in the outcome of the study. Most of them (146) were qualified with graduation level, while a few of them (42) completed their post-graduation. It was hinted that more number of both graduated and post-graduated level persons working with the concerned organizations and their voice about GHR practices and its effects reflected as an outcome of the study. The maximum number of replies (139) got for this study were from middle-level employees, while some of them (107) were from lower-level and others (59) were from the higher level. It was derived that middle and lower-level employees' voices were emulated in this study. Finally, Most of them (120) worked for that company for over 6 years but less than 9 years. Some of them (84) have experience of more than 9 years, and a few have experience of less than 1 year (13). Those voices were highly noted, and that would be replicated in the outcome of the study.

### Analysis of model

Generally, in social science studies, Partial Least Square (PLS) method is used to test the model trait, calculate the strength of the paths in the model and assess the multidimensional relationships in a comprehensive model. This technique becomes famous for management research because it assesses non-normality and neglects sample size constrain for the study (Hair et al., 2019). PLS-SEM was performed in this study to test the relationship among the variables. Structural Equation Modeling can divide into two sub-approaches. One is the measurement model, and another is the structural model. Further, the

measurement model helps to state the relationship between the latent variable and their measurement items, while the structural model helps to evaluate the relationship among latent constructs in the model (Sarstedt et al., 2019). For performing PLS-SEM, R software was used since R software is free and open software for single users. This is a kind of new platform used to perform statistics functions. Further, SEMinR library in R software facilitates to perform PLS-SEM (Hair et al., 2021).

### Evaluation of measurement model

The measurement model evaluation was used to measure the quality of each construct in this study. The purpose is to test the competency of each construct by using PLS-SEM, both in terms of reliability and validity. This measurement of constructs was gone through the following test (i) Indicator Reliability, (ii) Construct Reliability, (iii) Convergent validity, and (iv) Discriminant Validity (Hair et al., 2021).

In the first stage of evaluating the measurement model, indicator reliability was checked using indicator loadings. Indicator loadings refer to how each item correlates with the factors. It ranges from -1 to +1, with a value close to -1 and/or +1 indicating a high correlation with the underlying construct (Pett et al., 2003). Any item with less correlation with the concerned construct can be removed in social science studies. Moreover, it is expected to have correlation value between construct and measurement items should be more than the threshold value of 0.60 (Chin et al., 2008). In this study, none of the measurement items was removed from the model since factor loading with their underlying constructs is higher than the recommended value of 0.60. Hence, indicator reliability was achieved. The indicator loadings of each item with construct are shown in Table 1.

In examining the measurement model, the next step is to test the construct reliability and convergent validity of the model. Construct reliability is measured using Cronbach's alpha and Composite Reliability (CR). Both reliability measures have a value of over the required ceiling of 0.70 to achieve construct reliability (Hair et al., 2011). In this study, both Cronbach's alpha and composite reliability range from 0.80 to 0.95, as shown in Table 1. Therefore, construct reliability was attained.

The convergent validity was achieved through Average Variance Extracted (AVE). When AVE is greater than or equal to the recommended value of 0.50, the measurement items converge to measure the underlying constructs. Thus, convergent validity is obtained (Schuberth & Cantaluppi, 2017). As shown in Table 1,

Table 1

Factor loadings, Cronbach's Alpha, Composite Reliability and Average Variance Extracted

	Factor loadings	CA	CR	AVE
<b>GHR</b>		<b>0.950</b>	<b>0.962</b>	<b>0.834</b>
GHR1	0.918			
GHR <sup>2</sup>	0.922			
GHR3	0.915			
GHR4	0.915			
GHR5	0.897			
<b>GC</b>		<b>0.931</b>	<b>0.945</b>	<b>0.743</b>
GC1	0.818			
GC2	0.854			
GC3	0.867			
GC4	0.888			
GC5	0.857			
GC6	0.885			
<b>EEP</b>		<b>0.942</b>	<b>0.955</b>	<b>0.811</b>
EEP1	0.885			
EEP2	0.922			
EEP3	0.902			
EEP4	0.906			
EEP5	0.887			
<b>PEM</b>		<b>0.942</b>	<b>0.956</b>	<b>0.813</b>
PEM1	0.929			
PEM2	0.894			
PEM3	0.910			
PEM4	0.886			
PEM5	0.888			

Note: CA – Cronbach's Alpha, CR – Composite Reliability, AVE – Average Variance Extracted. Each construct's CA, and AVE were bolded.

AVE value of all the constructs is higher than the cut-off value of 0.50. Hence, convergent validity was accomplished.

The final step in the evaluation of the measurement model is ensuring discriminant validity. That means each construct in the model district with each other. This would be tested by Fornell and Larcker criterion and Heterotrait and Monotrait ratio (Henseler et al., 2009). According to Fornell & Larcker (1981), the

square root of AVE of the construct should be higher than the value of inter-correlation with other constructs. In the present study, the square root of AVE for a construct was higher than the inter-correlation with other constructs (Lowry et al., 2014). The result supports the establishment of discriminant validity, as shown in Table 2.

Table 2  
Fornell and Larcker Criterion value between each construct

	GHR	GC	PEM	EEP
GHR	<b>0.913</b>			
GC	0.582	<b>0.862</b>		
PEM	0.782	0.687	<b>0.901</b>	
EEP	0.705	0.721	0.801	<b>0.901</b>

Note: The square root of AVE of each variable is shown in bold and italic.

Heterotrait and Monotrait (HTMT) ratio is another popular test to explore discriminant validity for the constructs used in the model. This test is based on calculating the correlation between two constructs. The correlation ratio between the constructs is lesser than the threshold value of 0.90 (Henseler et al., 2009). The result is shown in Table 3 that HTMT ratio among the constructs is less than the recommended value of 0.90. Thus, discriminant validity is achieved.

Table 3  
Heterotrait and Monotrait Ratio of correlation between each construct with other constructs

	GHR	GC	PEM	EEP
GHR				
GC	0.618			
PEM	0.825	0.730		
EEP	0.744	0.770	0.847	

Note: The ratio between the constructs is less than 0.90.

### Evaluation of structural model

Once quality criteria, that is, reliability and validity of the measurement constructs in the model, are established, the next step is to assess the structural relationship among constructs (Lowry et al., 2014). This involves testing the collinearity issue, assessing the explanatory power of the model and assessing the structural relation and its significance (Hair et al., 2021).

When assessing the structural relationship between constructs, it is required to examine the collinearity issues since a series of regression equations are estimated to derive structural model coefficients for the relationship between constructs (Mooi & Sarstedt, 2014). Collinearity issues indicate through Variance Inflation Factors (VIF) values. VIF values above 5 in a study indicate the probable collinearity issues among the exogenous constructs (Becker et al., 2015). In this study, VIF values for all the exogenous constructs are below the ceiling value of 5. It is inferred that collinearity among the exogenous constructs is not a significant issue for the structural model. The result is shown in Table 4.

Table 4  
Variance Inflation Factors (VIF) values between  
IVs and DV

	EEP
GHR	1.921
GC	2.759
PEM	2.434

Note: The VIF values should not be more than 5.

The next step in assessing the structural model is evaluating  $R^2$  and  $F^2$  values to analyze the model's explanatory power (Hair et al., 2021).

$R^2$  is used to measure the variance explained by the exogenous constructs in each endogenous construct, implying the model's explanatory power. Further,  $R^2$  ranges from -1 to +1, and the value close to -1 and/or +1 demonstrates higher explanatory power of the model (Shmueli & Koppius, 2012). Moreover, the model's explanatory power is considered substantial, moderate, or weak if the  $R^2$  value is 0.75, 0.50, and 0.25, respectively (Falk & Miller, 1992). In Table 5,  $R^2$  values are shown as all the exogenous constructs (GHR, GC, and PEM) caused 70.8% of the variance on the endogenous construct (EEP), and one exogenous construct (GHR) caused 33.9% of the variance on the endogenous construct (GC). It is inferred that exogenous constructs have substantial and moderate influence over endogenous constructs.

Table 5  
The values of indicators of the model's explanatory power  
( $R^2$  and Adjusted  $R^2$ )

	GC	EEP
$R^2$	0.339	0.708
Adj $R^2$	0.336	0.704

$F^2$  is another metric to measure the model's explanatory power along with  $R^2$ .  $F^2$  indicates the significance of each exogenous construct in the model. It represents the effect size of the exogenous construct on the endogenous construct. If the value of  $F^2$  is less than or equal to 0.02, 0.15 and 0.35, then the effect size can be classified as small, medium and large, respectively (Cohen, 1988). In the moderation analysis model, each variable's effect size is calculated using the following formula (Hair Jr et al., 2021).

$$F^2 \text{ value} = (R^2_{\text{included}} - R^2_{\text{excluded}}) / 1 - R^2_{\text{included}}$$

In the present study, a large effect size would be deducted from GHR on GC ( $F^2 = 0.512$ ), whereas the effect size was medium ( $F^2 = 0.231$ ) for GHR on EEP since  $F^2$  values were greater than 0.15 but less than 0.35. The effect size of GC on EEP was medium ( $F^2 = 0.169$ ), and finally, the effect size between PEM and EEP was large ( $F^2 = 0.458$ ), as shown in Table 6.

Table 6  
The values of effect size ( $F^2$ ) of IVs on DV and MV

	GC	EEP
GHR	0.512	0.231
GC		0.169
PEM		0.458

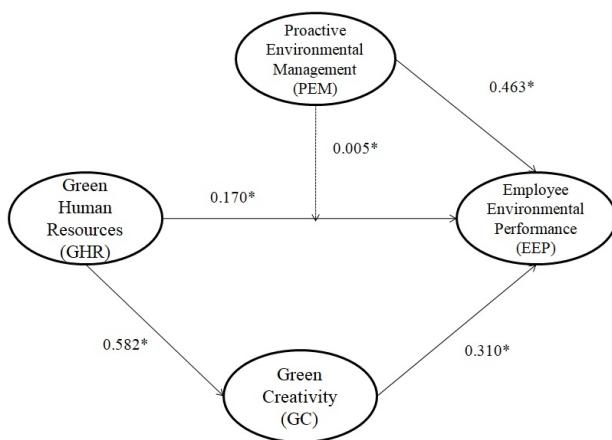
The next step in evaluating the structural model is examining path coefficients' relevance and significance (Hair et al., 2021). Path coefficients help to measure changes in the endogenous constructs by an exogenous construct, keeping other constructs constant (Benitez et al., 2020). Table 7 and Figure 5 show each exogenous construct's value on the study's endogenous constructs.

Table 7  
Path coefficients of IVs on DVs

	Original est.	Bootstrap SD	T stat.	p value
GHR → GC	0.582	0.045	12.980	0.003
GHR → EEP	0.170	0.054	3.163	0.043
GC → EEP	0.310	0.045	6.945	0.010
PEM → EEP	0.463	0.060	7.724	0.008

Note: p value should be less than 0.05 to accept the hypothesis.

It is concluded that one standard unit of changes in Green Human Resource practices positively and significantly affects the Employee Environment Per-

Fig. 5. Path Coefficients of IVs on DVs. Note: \* $p < 0.05$ 

formance of the employees at the level of 0.170 ( $\beta = 0.170, p < 0.05$ ). Hence, H1 is accepted. Further, Green Human Resource practices positively and significantly influence Green Creativity ( $\beta = 0.582, p < 0.05$ ). Thus, H2 is supported. Furthermore, it is found that Green Creativity positively and significantly influences the Employee Environment Performance of the employees ( $\beta = 0.310, p < 0.05$ ). Hence, H3 is accepted. Proactive Environment Management also correlates positively and significantly with Employee Environment Performance ( $\beta = 0.463, p < 0.05$ ). Thus, H5 was attained.

### Mediation analysis

Mediation Analysis was performed to study the mediational role of Green Creativity (GC) on the relationship between Green Human Resource (GHR) practices and Employee Environment Performance (EEP). To do that, PLS-SEM bootstrapping function was performed using R software in this study (Hair et al., 2021). This study addresses the following questions to study the mediation effect of GC on the relationship between GHR and EEP.

#### The questions are:

1. Is there a total effect between GHR and EEP while preventing the mediation effect by excluding variable GC from the model?

2. Are there significant changes that occurred in the total effect between GHR and EEP while including mediating variable GC into the model?
3. Is there a significant indirect effect of mediating variable GC occurring between GHR and EEP?

To address the above questions, mediation analysis was exercised to examine the total effect, direct effect and indirect effect in the model of the study. First, the mediating construct GC was excluded from the model and performed the analysis to study the total effect between GHR and EEP. The result described that the total effect between GHR and EEP is positive and significant ( $\beta = 0.350, p < 0.05$ ). This implies that one unit of changes in the GHR would be accounted for 0.350 changes on the EEP without including mediating variable GC. Second, the mediating construct GC was included in the model and examined the direct effect of GHR on the EEP. The result revealed that the effect size level has reduced when GC insertion and is significant ( $\beta = 0.170, p < 0.05$ ). This inferred that one unit of changes in the GHR would cause 0.170 changes on the EEP with the presence of GC. Finally, the strength of GC on the relationship between GHR and EEP was measured. It was found that there is a positive and significant indirect effect exists ( $\beta = 0.180, p < 0.05$ ). This hinted that a substantial level of impact (0.180) existed and would be the cause of a reduction in the relationship between GHR and EEP. Hence, H4 is supported. Thus, this study established that GC partially mediates the relationship between GHR and EEP. The small level of impact of GC on the relationship between GHR and EEP was ascertained in this study. The result is shown in Table 8. The indirect effect was calculated in R software using the following code (Hair et al., 2021).

#### #Specific Indirect Effect

```

specific_effect_significance(Boot_GHR,
  from = "Green Human Resource",
  through = "Green Creativity",
  to = "Employee Environmental Performance",
  alpha = 0.05)
  
```

Table 8  
The results of mediation analysis between GHR and EEP with GC

Total effect (GHR → EEP)		Direct effect (GHR → EEP)		Indirect Effect (GHR → EEP)					Results
Effect size	p-value	Effect size	p-value	(GHR → GC → EEP)	Effect size	SD	T value	p values	
0.350	0.013	0.170	0.043	(GHR → GC → EEP)	0.180	0.030	5.995	0.013	Partially Mediated

Note:  $p$  value should be less than 0.05 to accept the hypothesis

## Moderation analysis

The hypotheses were framed to test the moderation effect of Proactive Environment Management (PEM) on the relationship between Green Human Resource (GHR) practices and Employee Environment Performance (EEP) in this study. In order to do that, first, the interaction term was created using a two-stage method. Using this approach, the interaction term was specified by the product score of the exogenous construct and moderator construct (Becker et al., 2018; Henseler & Chin, 2010). In this study, the interaction term was created by calculating the product score of GHR and PEM.

Then, standard quality criteria were measured using  $F^2$  effect size for the interaction term (Fassott, 2018). In this study, the effect size was medium ( $F^2 = 0.458$ ) for PEM on EEP, as shown in Table 8. This means that the moderating construct PEM significantly changed the relationship between GHR and EEP. Then, moderation analysis was performed, and the result exposed that a positive and small effect of PEM existed between GHR and EEP but was not significant ( $\beta = 0.005$ ,  $p > 0.05$ ), as shown in Table 9. Therefore, H6 is not supported.

Table 9

The results of moderation analysis with the effect of PEM between GHR and EEP

	Original est.	Bootstrap SD	T stat.	p value
GHR * PEM → EEP	0.005	0.023	0.228	0.420

Note:  $p$  value should be less than 0.05 to accept the hypothesis.

Further, slope analysis was exercised to analyze the effect of moderator variable PEM on the relationship between GHR and EEP (Fassott, 2018). As discussed earlier, the interaction term (GHR\*PEM) has a positive but small impact on EEP of 0.005. However, the effect of GHR on EEP was positive, with a value of 0.170. This means that the level between GHR and EEP was 0.170 at the average level of PEM. Besides, at the higher level of PEM, i.e., every unit of standard deviation is increased, the effect of GHR on EEP gets increased by 0.005 from the average level of PEM (i.e.,  $0.170 + 0.005 = 0.175$ ). On the contrary, at the lower level of PEM, i.e., every unit of standard deviation is decreased; the effect of GHR on EEP gets decreased by 0.005 from the average level of PEM (i.e.,  $0.170 - 0.005 = 0.165$ ). This would happen since the effect of the interaction term was negative. In R software, slope analysis was performed using the following code (Hair et al., 2021).

### #Slope analysis

```
slope_analysis(moderated_model = Model_GHR,
dv = "Employee Environmental Performance",
moderator = "Proactive Environmental Management",
iv = "Green Human Resource",
leg_place = "bottom left")
```

The same would be depicted as the level of moderating effect of PEM on the relationship between GHR and EEP in Figure 6. In Figure 6, a single line represents the average or moderate PEM effect level. Besides, the dotted line represents the high level of PEM, which is above the mean value, whereas the dashed line represents the low level of PEM, substantially below the mean value. Further, the steepness expresses the size of changes of moderating variable on the relationship between exogenous variable and endogenous variable. If any of the lines is highly steeped, then a high moderating effect exists; if any of the slightly steeped, then there will be a low moderating effect (Dawson, 2014). From Figure 6, the steepness of the dotted line is high, which inferred that when there is a high level of presence of PEM would highly moderate or increase the relationship between GHR and EEP. At the same time, the dashed line is not much steeped, which indicates a low level of PEM would reduce the relationship between GHR and EEP. The single line is also not steeped; this would suggest that PEM's average level of existence would slightly moderate the relationship between GHR and EEP.

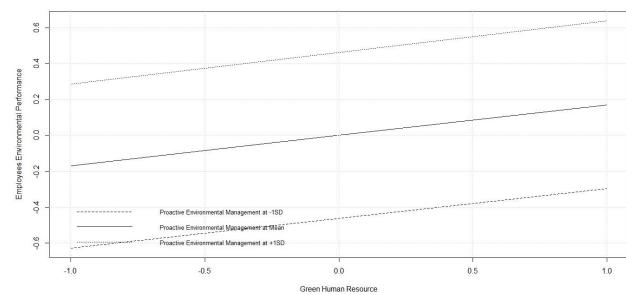


Fig. 6. The moderation effect of PEM on the relationship between GHR and EEP (Slope Analysis)

## Discussion

Organizations started realizing the importance of environmental protection and learning how to do protection. In this regard, using Green Human Resource Management (GHRM) is new to them (Dumont & Jie Shen, 2016). Researchers have given their attention to

the study of Green Human Resources (GHR) and its related thoughts. However, further extensive studies still need to explore new ideas and concepts (Shen et al., 2018). Past studies explored the very limited scope of GHR, and some of the studies state the qualitative nature of GHR (Dumont & Jie Shen, 2016; Kim et al., 2019; Saeed et al., 2019). Some studies mentioned the role of GHR in changing employees' behavior toward the environment (Renwick et al., 2016; Saeed et al., 2019). Further, According to Ren et al. (2018), there would be limited studies on GHR practices' influence on Green Creativity (GC) to shape the environmental behavior of employees and the intrinsic thoughts of top management. This study identified this as a research gap to explore the role of GHR practices in shaping employees' environmental behavior by creating a culture of GC. In addition, this study also assesses the significance of management in promoting Employees Environmental Performance (EEP). Thus, this study has attempted to assess the influence of GHR on EEP and the mediating role of GC in the relationship between GHR and EEP. Also, this study focuses on moderating Proactive Environmental Management (PEM) on the relationship between GHR and EEP.

From the analysis, this study found that GHR has a strong and significant influence over EEP positively. This result is the same as previous studies' findings that revealed a positive relationship between GHR and EEP (Awwad Al-Shammary et al., 2022; Kim et al., 2019). As suggested, when any company introduces the practices of GHR, it enhances the employees' behavior towards the environment. In other words, any company that wants to positively shape the employees' environmental behavior must adopt the GHR practices. Further, this study also found that GHR positively influences the GC, which is in line with the findings of a previous study done by Chen & Chang (2013) that mentioned pro-environmental ideas were motivated mainly by GHR policies and practices. Hence, it is concluded that GHR practices are the main cause of the creation of the culture of GC. One of the results of this study revealed the relationship between GC and EEP. It is suggested that GC positively influences EEP, which parallels previous studies of GC. According to Riva et al. (2021), GC changes the environmental behavior of employees. This result suggested the importance of the creative nature of employees to enhance EEP. Creating the GC becomes important for organizations to improve the EEP.

Furthermore, this study also tests the mediating effect of GC on GHR and EEP's relationship. The study established the mediating role of GC in shap-

ing EEP through GHR practices. GC has been partially mediating the relationship between GHR and EEP. That means GHR directly influences EEP positively, and this relationship would inflate more when GC is introduced as a mediator. Some previous studies support the positive relationship among all three variables, which was also established (Al-Ghazali & Afsar, 2020; Riva et al., 2021). The result suggested that a company must implement GHR policies and practices to create a creative culture (GC) through which to achieve EEP. Moreover, the role of GC is inevitable in developing EEP in an organization.

Besides, this study further examines the role of PEM in shaping the employees' performance against the environment. This study identified the importance of PEM for organizations to develop EEP. Earlier studies established the relationship between GHR and PEM in crafting the EEP in an organization (Ahmed et al., 2021). One step ahead, this study tested PEM as a moderator in the relationship between GHR and EEP. The study demonstrated that PEM moderates the relationship between GHR and EEP. It means that proactive management against the environment is essential for equipping EEP among employees through GHR. It is also suggested that high proactive management positively strengthens the relationship of GHR with EEP, whereas if the management is proactive, but at a low pace, it weakens the relationship between GHR and EEP. However, the average level of proactiveness normalizes the relationship between GHR and EEP but is positive.

This study stressed achieving the EEP through GHR practices and the importance of GC and PEM in shaping the EEP among employees in manufacturing companies in India.

## Managerial implication

Some practical contributions are made from this study, as discussed as follows. It is believed that the manufacturing industry is the main cause of environmental pollution and degradation, so manufacturing companies turned to the path of environmental protection (Tyagi et al., 2014). In this regard, companies are looking for new avenues to tackle environmental issues in India. This effort creates a new concept, Green Human Resources (GHR), in Indian manufacturing companies and unveils various thoughts that help overcome environmental problems through behavior approach (Mishra, 2017). As per the results of this study, GHR practices shape behavior and enhance Employees Environmental Performance (EEP). It guided companies to adopt GHR practices

to increase the performance of employees towards the environment. GHR practices, such as green recruitment, green training, green rewards, etc., enhance the EEP in manufacturing employees. Companies can even start this initiative in recruitment itself. They can give priority green concerned peoples for selection. In addition they add green behavior is one among the criteria to be selected. Added to that, when companies are train employees with green concerns, it would add more than awareness and knowledge, creating a sense of commitment towards nature and achieving the organizations' expected environmental goals. Simply it makes an emotional commitment against nature. GHR practices like green training formally educate the employees about environmental affairs and generate environmental knowledge for the employees. It increases the ability of the employees in environmental management. This makes managers easy to increase EEP in the respective companies.

Moreover, GHR practices stimulate Green Creativity (GC) among the employees in an organization. GHR practices include green rewards that motivate the employees to think uniquely, and in that way, creative culture can be created. In addition, management can conduct green workshops, conferences and training programs through which companies nurture green creative practices among the employees. Then, GC instigates to form green creative culture so that EEP can be enhanced in manufacturing companies. In such a way, GC becomes a path to achieve EEP in an organization. This will be an opportunity for the managers to develop the new thought school to promote and practice environmentally friendly activities such as green purchasing, using only reused products, and being concerned about using natural resources.

Similarly, this study has used Proactive Environmental Management (PEM) to analyze the level of impact on the EEP. Besides good image and government pressure or getting certification, companies should volunteer to promote environmental practices. It means instead of building a good image among their stakeholders and getting some green certification, companies and their management should have volunteerism towards the environment that helps attain the organization's environmental goals. For instance, companies can implement comprehensive recycling policies, derive policies to use renewable energy for the process and provide green training to the employees. Companies show a high level of their proactiveness by promoting their green process and practices through different platforms like social media. These activities make people famous in society and aid in connecting with people with the same thoughts. This is also helpful for companies to engage with

talented applicants with environmental knowledge. Eventually, those employees perform well against the environment and support others to perform the same. Therefore, it is suggested that a high level of PEM ensures EEP in the organizations.

Companies can conduct surveys at interval periods to understand and monitor employee behavioural changes. Companies can consider both work behavior and non-work behavior for evaluation. Behavioral changes include avoiding using hazardous products like plastic, practising recycling and using renewable energy for production purposes and educating his/her society towards green behavior, etc.

To summarize, manufacturing companies, such as automobiles, food processing, chemicals, textiles, machinery and equipment and their management must adopt GHR policies and practices to enhance EEP among the employees of the above specific organizations irrespective of their demographic characters, including gender, age and location etc. Further, creating GC is the fast way of attaining the goals. In addition, the management's level of interest increases the chance of achieving environmental goals in India.

## **Limitation and future scope for research**

Though the present study contributes to the concept of Green Human Resources (GHR), Green Creativity (GC), Proactive Environmental Management (PEM) and Employees Environmental Performance (EEP), still, it has some limitations. First, this study covers the behavior of employees and management from the manufacturing sector. Future studies can target employees from other sectors like educational institutions, IT, etc. Second, the study was conducted in the Indian context, and there could be limitations in generalizing this study's findings to other countries. Hence, the same study can be conducted in other countries. Third, future studies can conduct a comparative study with similar dimensions between green and non-green manufacturing companies or between manufacturing with other sectors. Fourth, the study model consists of single mediation and single moderation. The extension of this study can add more mediation and moderation, such as green psychology, green climate, green identity and/or green vision. Moreover, those studies may consider individual employees' knowledge and perspective about the environment as a moderator in the model, indicating personalized opinions about the environment. Fifth, this study neglects about source variables of GHR, but future studies can give importance to the antecedence

of GHR. Sixth, this study is survey-based, but an experimental study can be adapted to further analyze it in future studies. Finally, this study has only explored green outcomes (GC and EEP). However, [Shen et al. \(2018\)](#) stress that some non-green outcomes are affected by GHR practices. Hence, future studies can establish the influence of GHR over non-green behaviors of the employees, such as job commitment, job satisfaction, intention to quit, etc.

## Conclusion

In the era of globalization, companies, irrespective of industries, face tough competition. Companies are performing vigorously to overtake this competition. Due to that, environmental aspects are compromised by the companies. This would be one of the causes of climate change in the world. Prominent scientists worldwide and governments of different countries seek solutions from business processes. However, it needs behavioral and technical support. Interestingly, Sustainable Development Goals (SDGs) insist on the same. This study is about the behavioral approach to finding the solution for the issues with environmental. The GHR is one of the behavioral approaches that will be useful for companies to modify behavior against nature. This study is in line with previous studies on GHR influencing different green-based outcomes (i.e.) Green Creativity (GC) and Employee Environmental Performance (EEP). Companies can use GHR to create GC, which enhances EEP. Further, the GHR practices and GC will provide a unique environmental solution that differentiates from the respective competitors. This is proved that along with environmental solutions, GHR and GC help to obtain competitive advantages for a company. Another finding of this study was congruent with previous studies that a high level of voluntary participation is essential to find the environmental solution. Proactive Environmental Management (PEM) plays a key role in advancing finding solutions to environmental issues. In the present scenario, practicing the GHR and creating GC with the proactive participation of management has been proposed for the practitioners to benefit from EEP in a company.

## References

- Ahmad, I., Donia, M.B.L., & Shahzad, K. (2019). Impact of Corporate Social Responsibility Attributions on Employees' Creative Performance: The Mediating Role of Psychological Safety. *Ethics and Behavior*, 29(6), 490–509. DOI: [10.1080/10508422.2018.1501566](https://doi.org/10.1080/10508422.2018.1501566).
- Ahmad, S. (2015). Green Human Resource Management: Policies and practices. *Cogent Business and Management*, 2(1), 1–13. DOI: [10.1080/23311975.2015.1030817](https://doi.org/10.1080/23311975.2015.1030817).
- Ahmed, M., Guo, Q., Qureshi, M.A., Raza, S.A., Khan, K.A., & Salam, J. (2021). Do green HR practices enhance green motivation and proactive environmental management maturity in hotel industry? *International Journal of Hospitality Management*, 94(January), 102852. DOI: [10.1016/j.ijhm.2020.102852](https://doi.org/10.1016/j.ijhm.2020.102852).
- Al-Ghazali, B.M., & Afsar, B. (2020). Green human resource management and employees' green creativity: The roles of green behavioral intention and individual green values. *Corporate Social Responsibility and Environmental Management*, May, 1–18. DOI: [10.1002/csr.1987](https://doi.org/10.1002/csr.1987).
- Ali, Q., Haider, S., Ali, F., Jamshed, S., Ryu, K., & Saif, S. (2021). Green human resource management practices and environmental performance in Malaysian green hotels: The role of green intellectual capital and pro-environmental behavior. *Journal of Cleaner Production*, 311(May), 127504. DOI: [10.1016/j.jclepro.2021.127504](https://doi.org/10.1016/j.jclepro.2021.127504).
- Arago, J.A. (2019). *Proactive Corporate Environmental Strategies: Myths and Misunderstandings*. June 2007. DOI: [10.1016/j.lrp.2007.02.008](https://doi.org/10.1016/j.lrp.2007.02.008).
- Arora, M., & Kaul, A. (2020). Green Human Resource Management: An Empirical Study of India. *Visegrad Journal on Bioeconomy and Sustainable Development*, 9(2), 61–66. DOI: [10.2478/vjbsd-2020-0012](https://doi.org/10.2478/vjbsd-2020-0012).
- Arulrajah, A.A., Opatha, H.H.D.N.P., & Nawaratne, N.N.J. (2016). Green human resource management practices: a review. *Sri Lankan Journal of Human Resource Management*, 5(1), 1–16. DOI: [10.4038/sljhrm.v5i1.5624](https://doi.org/10.4038/sljhrm.v5i1.5624).
- Awan, F.H., Liu, D., Jamil, K., Gul, R.F., Anwar, A., & Qin, G. (2021). Mediating role of innovative climate among leadership and employee performance in textile exporting firms of Pakistan. *Industria Textila*, 72(6), 613–618. DOI: [10.35530/IT.072.06.20206](https://doi.org/10.35530/IT.072.06.20206).
- Awwad Al-Shammari, A.S., Alshammrei, S., Nawaz, N., & Tayyab, M. (2022). Green Human Resource Management and Sustainable Performance With the Mediating Role of Green Innovation: A Perspective of New Technological Era. *Frontiers in Environmental Science*, 10(June), 1–12. DOI: [10.3389/fenvs.2022.901235](https://doi.org/10.3389/fenvs.2022.901235).
- Becker, J.M., Ringle, C.M., & Sarstedt, M. (2018). Estimating moderating effects in pls-sem and plsc-sem: Interaction term generation\*Data treatment. *Journal of Applied Structural Equation Modeling*, 2(2). DOI: [10.47263/jasem.2\(2\)01](https://doi.org/10.47263/jasem.2(2)01).

- Becker, J.M., Ringle, C.M., Sarstedt, M., & Völckner, F. (2015). How collinearity affects mixture regression results. *Marketing Letters*, 26(4), 643–659. DOI: [10.1007/s11002-014-9299-9](https://doi.org/10.1007/s11002-014-9299-9).
- Benitez, J., Henseler, J., Castillo, A., & Schuberth, F. (2020). How to perform and report an impactful analysis using partial least squares: Guidelines for confirmatory and explanatory IS research. *Information and Management*, 57(2), 103168. DOI: [10.1016/j.im.2019.05.003](https://doi.org/10.1016/j.im.2019.05.003).
- Berry, M.A., & Randinelli, D.A. (1998). Proactive\_Corporate\_Environmental\_Management. *Academy of Management Executive*, 12(2), 38–50.
- Boudreau, J.W., & Ramstad, P.M. (2005). Talentship talent segmentation, and sustainability: A new hr decision science paradigm for a new strategy definition. *Human Resource Management*, 44(2), 129–136. DOI: [10.1002/hrm.20054](https://doi.org/10.1002/hrm.20054).
- Central Pollution Control Board, I. (2021). *Parivesh – Environmental Report*.
- Chams, N., & García-Blandón, J. (2019). On the importance of sustainable human resource management for the adoption of sustainable development goals. *Resources, Conservation and Recycling*, 141(October 2018), 109–122. DOI: [10.1016/j.resconrec.2018.10.006](https://doi.org/10.1016/j.resconrec.2018.10.006).
- Chaudhary, R. (2019). Green human resource management in Indian automobile industry. *Journal of Global Responsibility*, 10(2), 161–175. DOI: [10.1108/JGR-12-2018-0084](https://doi.org/10.1108/JGR-12-2018-0084).
- Chen, Y.S., & Chang, C.H. (2013). The Determinants of Green Product Development Performance: Green Dynamic Capabilities, Green Transformational Leadership, and Green Creativity. *Journal of Business Ethics*, 116(1), 107–119. DOI: [10.1007/s10551-012-1452-x](https://doi.org/10.1007/s10551-012-1452-x).
- Chin, W.W., Peterson, R.A., & Brown, S.P. (2008). Structural equation modeling in marketing: Some practical reminders. *Journal of Marketing Theory and Practice*, 16(4), 287–298. DOI: [10.2753/MTP1069-6679160402](https://doi.org/10.2753/MTP1069-6679160402).
- Chow, W.S., & Chen, Y. (2012). Corporate Sustainable Development: Testing a New Scale Based on the Mainland Chinese Context. *Journal of Business Ethics*, 105(4), 519–533. DOI: [10.1007/s10551-011-0983-x](https://doi.org/10.1007/s10551-011-0983-x).
- Ciachorowski, D., & Lis, A.M. (2022). Collective creativity in management science. *Engineering Management in Production and Services*, 14(3), 68–81. DOI: [10.2478/emj-2022-0027](https://doi.org/10.2478/emj-2022-0027).
- Ciarniene, R., Vienazindiene, M., & Adamoniene, R. (2020). Sustainable behaviour: Evidence from Lithuania. *Engineering Management in Production and Services*, 12(1), 80–92. DOI: [10.2478/emj-2020-0007](https://doi.org/10.2478/emj-2020-0007).
- Cohen, E.; Taylor, S.; Muller-Camen, M. (2012). SHRM Foundation's Effective Practice Guidelines Series HRM's Role in Corporate Social and Environmental Sustainability. In *SHRM Foundation's Effective Practice Guidelines Series*. [www.shrmfoundation.org](http://www.shrmfoundation.org)
- Cohen, J. (1988). Set Correlation and Contingency Tables. *Applied Psychological Measurement*, 12(4), 425–434.
- Dangelico, R.M., Pujari, D., & Pontrandolfo, P. (2017). Green Product Innovation in Manufacturing Firms: A Sustainability-Oriented Dynamic Capability Perspective. *Business Strategy and the Environment*, 26(4), 490–506. DOI: [10.1002/bse.1932](https://doi.org/10.1002/bse.1932).
- Darvishmotevali, M., Altinay, L., & Köseoglu, M.A. (2020). The link between environmental uncertainty, organizational agility, and organizational creativity in the hotel industry. *International Journal of Hospitality Management*, 87(January), 102499. DOI: [10.1016/j.ijhm.2020.102499](https://doi.org/10.1016/j.ijhm.2020.102499).
- Dawson, J.F. (2014). Moderation in Management Research: What, Why, When, and How. *Journal of Business and Psychology*, 29(1), 1–19. DOI: [10.1007/s10869-013-9308-7](https://doi.org/10.1007/s10869-013-9308-7).
- Dumont, J., Shen J., Xin D. (2016). Effects of Green Hrm Practices on Employee Workplace Green Behavior: The Role of Psychological Green Climate and Employee Green Values. *Human Resource Management*, 56(4), 613–627. DOI: [10.1002/hrm.21792](https://doi.org/10.1002/hrm.21792).
- Eltayeb, T.K., Zailani, S., & Ramayah, T. (2011). Green supply chain initiatives among certified companies in Malaysia and environmental sustainability: Investigating the outcomes. *Resources, Conservation and Recycling*, 55(5), 495–506. DOI: [10.1016/j.resconrec.2010.09.003](https://doi.org/10.1016/j.resconrec.2010.09.003).
- Falk, R.F., & Miller, N.B. (1992). A Primer for Soft Modeling. In *The University of Akron Press* (Issue April).
- Fassott, J.H. and G. (2018). Testing Moderating Effects in PLS Path Models: An Illustration of Available Procedures. In *Handbook of Partial Least Squares, Springer Handbooks of Computational Statistics* (Vol. 2, Issue 1).
- Fornell, C., & Larcker, D.F. (1981). “Evaluating structural equation models with unobservable variables and.pdf. *Journal of Marketing Research*, XVIII (February), 39–50.
- Gilal, F.G., Ashraf, Z., Gilal, N.G., Gilal, R.G., & Channa, N.A. (2019). Promoting environmental performance through green human resource management practices in higher education institutions:

- A moderated mediation model. *Corporate Social Responsibility and Environmental Management*, 26(6), 1579–1590. DOI: [10.1002/csr.1835](https://doi.org/10.1002/csr.1835).
- Gonză, J. (2005). *Environmental proactivity and business performance: an empirical analysis*. 33, 1–15. DOI: [10.1016/j.omega.2004.03.002](https://doi.org/10.1016/j.omega.2004.03.002).
- González-Sánchez, D., Suárez-González, I., & González-Benito, J. (2018). Human resources and manufacturing: where and when should they be aligned? *International Journal of Operations and Production Management*, 38(7), 1498–1518. DOI: [10.1108/IJOPM-07-2017-0393](https://doi.org/10.1108/IJOPM-07-2017-0393).
- Haddock-Millar, J., Sanyal, C., & Müller-Camen, M. (2016). Green human resource management: A comparative qualitative case study of a United States multinational corporation. *International Journal of Human Resource Management*, 27(2), 192–211. DOI: [10.1080/09585192.2015.1052087](https://doi.org/10.1080/09585192.2015.1052087).
- Hair, Joe F., Ringle, C.M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing Theory and Practice*, 19(2), 139–152. DOI: [10.2753/MTP1069-6679190202](https://doi.org/10.2753/MTP1069-6679190202).
- Hair, Joseph F., Risher, J.J., Sarstedt, M., & Ringle, C.M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2–24. DOI: [10.1108/EBR-11-2018-0203](https://doi.org/10.1108/EBR-11-2018-0203).
- Hair Jr, J.F., Hult, G.T.M., Ringle, C.M., Sarstedt, M., Danks, N.P., & Ray, S. (2021). Partial least squares structural equation modeling (PLS-SEM) using R: A workbook. In Springer. <https://link.springer.com/content/pdf/10.1007/978-3-030-80519-7.pdf>
- Hamdollah, R., & Baghaei, P. (2016). Partial least squares structural equation modeling with R. *Practical Assessment, Research and Evaluation*, 21(1), 1–16.
- Hariharasudan, A., Kot, S., & Sangeetha, J. (2021). The decades of research on scm and its advancements: Comprehensive framework. *Acta Logistica*, 8(4), 455–477. DOI: [10.22306/al.v8i4.264](https://doi.org/10.22306/al.v8i4.264).
- Henseler, J., & Chin, W.W. (2010). A comparison of approaches for the analysis of interaction effects between latent variables using partial least squares path modeling. *Structural Equation Modeling*, 17(1), 82–109. DOI: [10.1080/10705510903439003](https://doi.org/10.1080/10705510903439003).
- Henseler, J., Ringle, C.M., & Sarstedt, M. (2009). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 20(1), 277–205. DOI: [10.11747-014-0403-8](https://doi.org/10.11747-014-0403-8).
- Jackson, S.E. (2018). Managing Human Resources for Environmental Sustainability: Challenges and Prospects. *Business Scholars Lecture, Nottingham Business School, Nottingham Trent University, January, 1–2*.
- Kalamas, M., Cleveland, M., & Laroche, M. (2014). Pro-environmental behaviors for thee but not for me: Green giants, green Gods, and external environmental locus of control. *Journal of Business Research*, 67(2), 12–22. DOI: [10.1016/j.jbusres.2013.03.007](https://doi.org/10.1016/j.jbusres.2013.03.007).
- Khaskheli, A., Jiang, Y., Raza, S.A., Qureshi, M.A., Khan, K.A., & Salam, J. (2020). Do CSR activities increase organizational citizenship behavior among employees? Mediating role of affective commitment and job satisfaction. *Corporate Social Responsibility and Environmental Management*, 27(6), 2941–2955. DOI: [10.1002/csr.2013](https://doi.org/10.1002/csr.2013).
- Kim, Y.J., Kim, W.G., Choi, H.M., & Phetvaroon, K. (2019). The effect of green human resource management on hotel employees' eco-friendly behavior and environmental performance. *International Journal of Hospitality Management*, 76(March 2018), 83–93. DOI: [10.1016/j.ijhm.2018.04.007](https://doi.org/10.1016/j.ijhm.2018.04.007).
- Kot, S. *Development Insights on Supply Chain Management in Small and Medium-sized Enterprises*. Logos Verlag, Berlin 2023.
- Kramar, R. (2014). Beyond strategic human resource management: Is sustainable human resource management the next approach? *International Journal of Human Resource Management*, 25(8), 1069–1089. DOI: [10.1080/09585192.2013.816863](https://doi.org/10.1080/09585192.2013.816863).
- Kwak, S.K., & Kim, J.H. (2017). Statistical data preparation: Management of missing values and outliers. *Korean Journal of Anesthesiology*, 70(4), 407–411. DOI: [10.4097/kjae.2017.70.4.407](https://doi.org/10.4097/kjae.2017.70.4.407).
- Lowry, P.B., & Gaskin, J.E. (2014). Partial Least Squares (PLS) Structural Equation Modeling (SEM) for Building and Testing Behavioral Causal Theory: When to Choose It and How to Use It. *IEEE Transactions on Professional Communication*, 57(2), 123–146.
- Mandip, G. (2012). Green HRM: People Management Commitment to Environmental Sustainability. *Research Journal of Recent Sciences*, 1(12), 244–252. DOI: [10.3390/SU11123257](https://doi.org/10.3390/SU11123257).
- Masri, H.A., & Jaaron, A.A.M. (2017). Assessing green human resources management practices in Palestinian manufacturing context: An empirical study. *Journal of Cleaner Production*, 143, 474–489. DOI: [10.1016/j.jclepro.2016.12.087](https://doi.org/10.1016/j.jclepro.2016.12.087).
- Mehmood, S., Shah, A., Jiang, Y., Wu, H., Ahmed, Z., Ullah, I., & Adebayo, T.S. (2021). Linking Green Human Resource Practices and Environmental Economics Performance: The Role of Green Economic Organizational Culture and Green Psychological Climate. *International Journal of Environment Research*

- and Public Health, 18(20), 1–17. DOI: [10.3390/ijerph182010953](https://doi.org/10.3390/ijerph182010953).
- Mishra, P. (2017). Green human resource management: A framework for sustainable organizational development in an emerging economy. *International Journal of Organizational Analysis*, 25(5), 762–788. DOI: [10.1108/IJOA-11-2016-1079](https://doi.org/10.1108/IJOA-11-2016-1079).
- Mooi, E., & Sarstedt, M. (2014). A Concise Guide to Market Research: The Process, Data, and Methods Using IBM SPSS Statistic. In *the process, data, and methods using IBM SPSS statistics*. DOI: [10.1007/978-3-642-12541-6](https://doi.org/10.1007/978-3-642-12541-6).
- Muangmee, C., Kassakorn, N., Khalid, B., Bacik, R., & Kot, S. (2022). Evaluating Competitiveness in the Supply Chain Management of Small and Medium Scale Enterprises. *Journal of Competitiveness*, 14(2), 93–112. DOI: [10.7441/joc.2022.03.06](https://doi.org/10.7441/joc.2022.03.06).
- Norton, T.A., Zacher, H., Parker, S.L., & Ashkanasy, N.M. (2017). Bridging the gap between green behavioral intentions and employee green behavior: The role of green psychological climate. *Journal of Organizational Behavior*, 38(7), 996–1015. DOI: [10.1002/job.2178](https://doi.org/10.1002/job.2178).
- Nuanphromsakul, K., Szczepańska-Woszczyna, K., Kot, S., Chaveesuk, S., & Chaiyasoonthorn, W. (2022). Sustainability of rubber farmers cooperatives: Empirical evaluation of determining factors. *Agris on-Line Papers in Economics and Informatics*, 14(4), 85–96. DOI: [10.7160/aol.2022.140407](https://doi.org/10.7160/aol.2022.140407).
- O'Donohue, W., & Torugsa, N.A. (2016). The moderating effect of 'Green' HRM on the association between proactive environmental management and financial performance in small firms. *International Journal of Human Resource Management*, 27(2), 239–261. DOI: [10.1080/09585192.2015.1063078](https://doi.org/10.1080/09585192.2015.1063078).
- Omarova, L., & Jo, S.J. (2022). Employee Pro-Environmental Behavior: The Impact of Environmental Transformational Leadership and GHRM. *Sustainability (Switzerland)*, 14(4). DOI: [10.3390/su14042046](https://doi.org/10.3390/su14042046).
- Opatha, H.H.D.N.P., & Arulrajah, A.A. (2014). Green Human Resource Management: Simplified General Reflections. *International Business Research*, 7(8). DOI: [10.5539/ibr.v7n8p101](https://doi.org/10.5539/ibr.v7n8p101).
- Paillé, P., Chen, Y., Boiral, O., & Jin, J. (2014). The Impact of Human Resource Management on Environmental Performance: An Employee-Level Study. *Journal of Business Ethics*, 121(3), 451–466. DOI: [10.1007/s10551-013-1732-0](https://doi.org/10.1007/s10551-013-1732-0).
- Pett, M.A., Lackey, N.R., & Sullivan, J.J. (2003). Making sense of factor analysis: An overview of factor analysis. *SAGE Publications, Inc.*, 18(6), 1–13.
- Provasnek, A.K., Sentic, A., & Schmid, E. (2017). Integrating Eco-Innovations and Stakeholder Engagement for Sustainable Development and a Social License to Operate. *Corporate Social Responsibility and Environmental Management*, 24(3), 173–185. DOI: [10.1002/csr.1406](https://doi.org/10.1002/csr.1406).
- Rahiman, H.U., Nawaz, N., Kodikal, R., & Hariharasudan, A. (2021). Effective information system and organisational efficiency. *Polish Journal of Management Studies*, 24(2), 398–413. DOI: [10.17512/pjms.2021.24.2.25](https://doi.org/10.17512/pjms.2021.24.2.25).
- Rahiman, U.R., Kodikal, R., Biswas, S., & Hariharasudan, A. (2020). A meta-analysis of emotional intelligence and organizational commitment. *Polish Journal of Management Studies*, 22(1), 418–433. DOI: [10.17512/pjms.2020.22.1.27](https://doi.org/10.17512/pjms.2020.22.1.27).
- Rayner, J., & Morgan, D. (2018). An empirical study of 'green' workplace behaviours: ability, motivation and opportunity. *Asia Pacific Journal of Human Resources*, 56(1), 56–78. DOI: [10.1111/1744-7941.12151](https://doi.org/10.1111/1744-7941.12151).
- Ren, S., Tang, G., & E. Jackson, S. (2018). Green human resource management research in emergence: A review and future directions. *Asia Pacific Journal of Management*, 35(3), 769–803. DOI: [10.1007/s10490-017-9532-1](https://doi.org/10.1007/s10490-017-9532-1).
- Renwick, D.W.S., Jabbour, C.J.C., Muller-Camen, M., Redman, T., & Wilkinson, A. (2016). Contemporary developments in Green (environmental) HRM scholarship. *International Journal of Human Resource Management*, 27(2), 114–128. DOI: [10.1080/09585192.2015.1105844](https://doi.org/10.1080/09585192.2015.1105844).
- Riva, F., Magrizos, S., & Rubel, M.R.B. (2021). Investigating the link between managers' green knowledge and leadership style, and their firms' environmental performance: The mediation role of green creativity. *Business Strategy and the Environment*, 30(7), 3228–3240. DOI: [10.1002/bse.2799](https://doi.org/10.1002/bse.2799).
- Robertson, J.L., & Barling, J. (2013). Greening organizations through leaders' influence on employees' pro-environmental behaviors. *Journal of Organizational Behavior*, 34(2), 176–194. DOI: [10.1002/job.1820](https://doi.org/10.1002/job.1820).
- Ruepert, A., Keizer, K., Steg, L., Maricchiolo, F., Carrus, G., Dumitru, A., García Mira, R., Stancu, A., & Moza, D. (2016). Environmental considerations in the organizational context: A pathway to pro-environmental behaviour at work. *Energy Research and Social Science*, 17, 59–70. DOI: [10.1016/j.erss.2016.04.004](https://doi.org/10.1016/j.erss.2016.04.004).
- Saeed, B. Bin, Afsar, B., Hafeez, S., Khan, I., Tahir, M., & Afridi, M.A. (2019). Promoting employee's pro-environmental behavior through green human resource management practices. *Corporate Social Re-*

- sponsibility and Environmental Management, 26(2), 424–438. DOI: [10.1002/csr.1694](https://doi.org/10.1002/csr.1694).
- Sarstedt, M., Hair, J.F., Cheah, J.H., Becker, J.M., & Ringle, C.M. (2019). How to specify, estimate, and validate higher-order constructs in PLS-SEM. *Australasian Marketing Journal*, 27(3), 197–211. DOI: [10.1016/j.ausmj.2019.05.003](https://doi.org/10.1016/j.ausmj.2019.05.003).
- Schuberth, F., & Cantaluppi, G. (2017). Ordinal consistent partial least squares. In *Partial Least Squares Path Modeling: Basic Concepts, Methodological Issues and Applications*. DOI: [10.1007/978-3-319-64069-3\\_6](https://doi.org/10.1007/978-3-319-64069-3_6).
- Shen, J., & Benson, J. (2016). When CSR Is a Social Norm: How Socially Responsible Human Resource Management Affects Employee Work Behavior. *Journal of Management*, 42(6), 1723–1746. DOI: [10.1177/0149206314522300](https://doi.org/10.1177/0149206314522300).
- Shen, J., Dumont, J., & Deng, X. (2018). Employees' Perceptions of Green HRM and Non-Green Employee Work Outcomes: The Social Identity and Stakeholder Perspectives. *Group and Organization Management*, 43(4), 594–622. DOI: [10.1177/1059601116664610](https://doi.org/10.1177/1059601116664610).
- Shmueli, G., & Koppius, O. (2012). Predictive Analytics in Information Systems Research. *SSRN Electronic Journal*. DOI: [10.2139/ssrn.1606674](https://doi.org/10.2139/ssrn.1606674).
- Song, W., Wang, G.Z., & Ma, X. (2020). Environmental innovation practices and green product innovation performance: A perspective from organizational climate. *Sustainable Development*, 28(1), 224–234. DOI: [10.1002/sd.1990](https://doi.org/10.1002/sd.1990).
- Tang, G., Chen, Y., Jiang, Y., Paillé, P., & Jia, J. (2018). Green human resource management practices: scale development and validity. *Asia Pacific Journal of Human Resources*, 56(1), 31–55. DOI: [10.1111/1744-7941.12147](https://doi.org/10.1111/1744-7941.12147).
- Teixeira, A.A., Jabbour, C.J.C., & Jabbour, A.B.L.D.S. (2012). Relationship between green management and environmental training in companies located in Brazil: A theoretical framework and case studies. *In-*
- ternational Journal of Production Economics*, 140(1), 318–329. DOI: [10.1016/j.ijpe.2012.01.009](https://doi.org/10.1016/j.ijpe.2012.01.009).
- Tuan, L.T. (2020). Environmentally-specific servant leadership and green creativity among tourism employees: dual mediation paths. *Journal of Sustainable Tourism*, 28(1), 86–109. DOI: [10.1080/09669582.2019.1675674](https://doi.org/10.1080/09669582.2019.1675674).
- Tyagi, S., Garg, N., & Paudel, R. (2014). Environmental Degradation: Causes and Consequences. *European Researcher*, 81(8-2), 1491. DOI: [10.13187/er.2014.81.1491](https://doi.org/10.13187/er.2014.81.1491).
- Wu, Y.-C., Huang Y.-C.J. (2010). The effects of organizational factors on green new product success. *Management Decision*, 48(10), 1539–1567. DOI: [10.1108/00251741011090324](https://doi.org/10.1108/00251741011090324).
- Yang, D. (2019). Proactive environmental strategy, innovation capability, and stakeholder integration capability: A mediation analysis. *Business Strategy and the Environment*, 28(8), 1–14. DOI: [10.1002/bse.2329](https://doi.org/10.1002/bse.2329).
- Young, W., Davis, M., Mcneill, I.M., Malhotra, B., Russell, S., Unsworth, K., & Clegg, C.W. (2015). Changing Behaviour: Successful Environmental Programmes in the Workplace. *Business Strategy and the Environment*, 24(8), 689–703. DOI: [10.1002/bse.1836](https://doi.org/10.1002/bse.1836).
- Yusliza, M., Tanveer, M.I., Thurasamy, R., Kumar, S.C., Saputra, J., & Faezah, J.N. (2021). Perceived green human resource management among employees in manufacturing firms. *Polish Journal of Management Studies*, 23(1), 470–486. DOI: [10.17512/pjms.2021.23.1.29](https://doi.org/10.17512/pjms.2021.23.1.29).
- Zaid, A., Talib Bon, T., & Jaaron, A.M. (2018). Green Human Resource Management Bundle Practices and Manufacturing Organizations for Performance Optimization: a Conceptual Model. *International Journal of Engineering & Technology*, 7(3.20), 87–91. DOI: [10.14419/ijet.v7i3.20.18986](https://doi.org/10.14419/ijet.v7i3.20.18986).