

# The Effect of Green Human Resource Practices on Green Innovation Performance: A New Paradigm from Industrial Companies in Jordan



Khaled Mohammad Banyhamdan, Ruba Risheed Al-Ghdabi, Reham Zuhier Qasim Almomani

**Abstract:** *The objectives of this study are twofold. First to explore the extent to which green human resource practices are applied in industrial companies in Jordan. Second, to investigate the impact of applying green human resources practices on green innovation performance. Green human resource practices were measured using green recruitment, green performance measurement, green training and development, and green pay and rewards. Green innovation performance was measured by green product innovation and green process innovation. Using a questionnaire developed based on the literature and distributed to a sample of managers (n = 350) from industrial companies (N = 47) in Jordan, the findings revealed a moderate degree of GHR practices adoption by industrial companies in Jordan. On the other hand, the results emphasized a significant effect of GHR practices on companies' green innovation performance. In light of these results, the study recommend that industrial companies should pay greater attention to the adoption of GHR practices due to the positive impact of these practices on improving the innovation performance of companies. The study is considered one of the few studies that dealt with the impact of green human resource practices on green innovation performance, thus making a significant contribution to industrial companies and companies in other sectors in terms of the importance of GHR practices and the positive impact of these practices.*

**Keywords:** *Green human resources management, green innovation, performance, industrial companies.*

## I. INTRODUCTION

Organizations' interest in environmental sustainability has led to an expansion of their activities and practices, for example expanding human resources practices to include environmental aspects. These practices are called green human resource practices (GHR). There are many global applications for green practices of human resources by

organizations [1]. The idea behind GHR is to link human resources functions to environmental management; using environmentally friendly practices [2]. GHR was described by Renwick et al. (2013) as an aspect of human resources practices in the context of environmental management[3].

GHR practices was introduced to direct human resource practices towards the sustainable use of company resources [4]. Jabbour (2011) stated that the introduction of GHR practices was an approach to incorporate human resource practices in the environmental management[5]. The ultimate goal of GHR practices is to enhance the effective management of environmental management system which improve the overall performance of the company and help companies to achieve competitive advantage. Yusoff et al. (2015) added that the role of green practices is not limited to this objective but also includes the social and economic aspects of the organization[6]. In a review of GHR literature, Cherian and Jacob (2012) concluded that organizations receive a number of benefits as a result of adopting green human resource practices, such as improved rate of employee retention, enhanced corporate image, greater opportunities to attract better employees, increased degree of productivity and sustainability, reduced the adverse environmental impact, and increased overall performance[7]. Other benefits of GHR practices cited in [8] include reduction of the overall cost, enhancement of innovation, and preservation of natural resources. Given that these benefits, this study seeks to explore the effect of using GHR in industrial companies in Jordan. In fact, little research has been taking place to examine the effects of GHR practices. The majority of the studies conducted in this regard have been based on recognizing the reality of adopting and applying the green practices of human resources in companies or identifying the initiatives undertaken by the companies. On the other hand, green innovation performance (GIP) is gaining an increased attention for organizations due to its positive role in improving the competitive advantage of companies [9]. Another reason for interest in green innovation is the growing interest of customers, government and society in environmental issues [10]. In relation to the measurements of green innovation performance, three common factors were found in the literature: green product innovation, green process innovation and green innovation management. In a study carried out by Alhadid and Abu-Rumman (2014) on the impact of green innovation on organizational performance in the industrial sector in Jordan, green innovation was measured using two

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dimensions: green product innovation and green process innovation[11].Zailani et al. (2015) investigated the Malaysian case of green innovation adoption in automotive supply chain using green product innovation and green process innovation[10].

The majority of the studies that dealt with green innovation performance were concerned with studying its relationship with organizational performance [10,12].

Studies conducted to identify the impact of GHR practices on green innovation performance are few, especially when talking about Jordanian industrial companies. Therefore, the present study is intended to fill this gap and to provide a benefit for industrial companies by defining the importance of green practices. The present study aimed at identifying the extent to which green practices are applied in industrial companies and to explore the impact of these practices on green innovative performance.

## II. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Previous studies have identified a set of practices for green human resource practices. In a study [4], the following practices of GHR were identified: green recruitment, green performance management, green training and development, green compensation, and green employee relations. Similar practices have been found in many previous studies. Jackson et al. (2011) studied the following practices: recruitment, performance measurement, training, development and learning, in addition to compensation and rewards as well as greening organizational culture[5]. Arulrajah et al. (2015)cited the following practices: green job design and analysis, GHR planning, green recruitment, green selection, green induction, green performance assessment, green training and development, green reward management, green health and safety management, green employee discipline management and green employee relations[1]. Table 1 shows a summary of GHR practices found in the literature.

**Table 1. GHR practices in the literature**

Practices	References
Green recruitment	[1,4,5,7,8,13–18]
Green performance management	
Green training and development	
Green compensation and rewards	
Green employee relations	
Greening organizational culture	
GHR planning	
Green induction	
Green selection	
Green employee discipline management	
Green health and safety management	
Green counseling	

The present study concerned with four dimensions of GHR according to their prevalence in the literature: Green recruitment, green performance measurement, green training and development, and green compensation and rewards. The following is a discussion of these dimensions and their relationships with green innovation performance.

### A. Green recruitment and green innovation performance

Green recruitment(GR) was defined as recruiting employees with knowledge, skills and behaviors related to environmental management systems [1,4], indicated that what companies do in the field of green recruitment is the integration of environmental policy and strategy of the organization into recruitment policy. Green recruitment was measured by [5]at two items described the organization’s environmental performance that attracts new candidates and the organization’s preference to hire those who have environment-related knowledge. Based on the literature review carried out by [7], two key objectives of green recruitment were suggested which were employee awareness of the company environmental behavior and employee attraction based on the company green practices.In general, a number of studies have found a significant impact of employment in improving innovative performance [19]. Green practices promote the environmental initiatives of the organization by increasing employee’s awareness and commitment to environmental sustainability issues. The adoption of green practices, such as green recruitment, is essential to achieving the required product and process green improvement [14]. Hillestad et al. (2010) indicated that building a strong organizational culture based on green innovation falls under the responsibility of managers who can use green practices such as green recruitment and green incentives to achieve this goal[20]. Shahnaei and Long (2015) indicated that recruitment has a positive impact on organizational innovation performance[10],based on these results, it was suggested that:

H1: GR has a significant positive impact on GIP

### B. Green performance measurement and green innovation performance

In terms of greenperformancemanagement, emphasis was placed on performance measurement (GPM).Ahmad (2015) has recommended future studies that address green human resource practices to focus on the dimensions of the performance appraisal rating system such as teamwork, cooperation, innovation, and environmental leadership in the context of responsibility and environmental performance[4].Jackson et al. (2011) believe that the practice of recruitment contributes to the support of effective environmental management as it ensures the employment of employees who are aware of the environmental culture of the organization.They added that the measurement of environmental performance involves the adoption of information systems that allow tracking acquisition of resources, use of resources, waste management, as well as conducting field audits[5]. Moreover, employee accountability is an important issue in assessing performance.Performance measurement as a practice of HR practices was found to be positively related to innovation performance [19]. In comparison, it was assumed that green performance measurement plays a significant role in improving green innovation performance as depicted in the following hypothesis:

H2: GPM has a significant positive impact on GIP

**C. Green training and development and green innovation performance**

Ahmad (2015) has defined green training and development (GT) as a practice that involves providing the employee with skills in energy saving, waste minimization, spreading environmental awareness within the organization, and giving employees the opportunity to participate in solutions to environmental problems[4]. Jackson et al. (2011) argued that employee training in the context of GHR practices play an important role in terms of educating employees the requirements of regulatory and technical standards and developing new skills by which these standards can be met[5]. For Jabbour (2011), green training was measured by three items related to the nature of training as a continuous process, a priority of the organization and as an important investment[21]. Concerning the impact of training on innovation performance, a number of studies found a significant impact of training on innovation performance. In a study on Spanish manufacturing companies, Diaz-Fernandez et al. (2017) indicated that training on new technologies was positively related to innovation performance represented in the number of patents[22]. Green training is supposed to provide employees with knowledge of environmental issues, this knowledge is necessary to improve green performance in the area of products and processes. Training was positively related to the innovative work behavior [17]. Accordingly, the following hypothesis was proposed:

H3: GT has a significant positive impact on GIP

**D. Green pay and rewards and green innovation performance**

Ahmad (2015) has argued that green rewards (GR) are efficient ways to encourage employees' alignment to environmental practices[4]. Jackson et al. (2011) pointed out that rewards, whether monetary or non-monetary, are important tool in supporting employees' commitment to the environmental activities and practices[5]. According to Jabbour(2011), green rewards are awarded to employees based on their environmental performance and the environmental performance of the organization is observed to the public[21]. Cherian and Jacob (2012) stated that some companies offer rewards for creative ideas from their employees in the field of innovative solutions to reduce waste[7]. According to Diaz-Fernandez et al. (2017), compensations and rewards mediated the relationship between training and innovation performance[22]. Using a sample of employees working at four Dutch manufacturing companies, Bos-Nehles and Veenendaal (2017) investigated employees' perceptions on human resource practices and innovation work behavior[17]. Their results indicated the compensation system is negativity associated with innovative work behavior. For Shahnaei and Long (2015), rewards have a significant impact on organizational innovation performance. In order to test the relationship between green rewards and green innovation performance using a sample of Jordanian industrial companies, the following hypothesis was assumed:

H4: GPR has a significant positive impact on GIP

**III. METHODOLOGY**

**A. Population and sample**

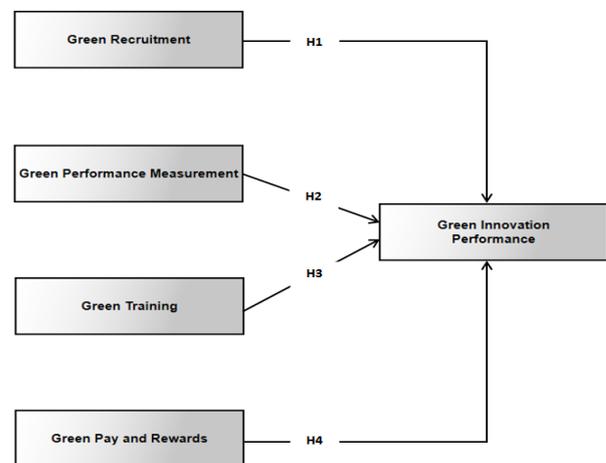
The population of this study encompassed managers of industrial companies in Jordan. The study was attended by managers of 47 companies. A convenience sample of 350 participants was selected to collect data.

**B. Study tool and data collection**

A questionnaire was initially developed based on the literature. The first section was comprised 20 items used to measure GHR practices while the second one contained 6 items to measure green innovation performance. All items were accepted during the validation of the measurement model. A total of 350 questionnaires were distributed to the participants. Two hundred and ninety-four questionnaires were returned with a response rate of 84%. The majority of the respondents were males (73%), aged 57-35 years (57%), working in administrative positions (69%) and technical jobs (24%). Most of them hold a bachelor's degree in different disciplines (64%).

**C. The conceptual model**

Figure 1 shows the conceptual model used in the current study. the model comprised four independent variables: green recruitment, green performance management, green training as well as green pay and rewards along with on dependent variable: green innovation performance. It was hypothesized as shown in the model that the four independent variables have significant positive impacts on the dependent one. That is, the model consists of four hypotheses (H1-H4).



**Figure 1. The conceptual model**

**D. The measurement model**

Twenty items were selected from the literature to measure GHR practices[17,18]. The measurements of GHR practices were developed on the basis of the measurement model. Following [23], the measurement model was measured by individual item reliability, discriminant validity and internal consistency. Table 2 shows the results of factor reduction, average variance extracted (AVE) values, composite reliability (CR) and Cronbach's Alpha (α).

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The results in Table 2 shows that validity and reliability were established. Individual item reliability was evaluated based factor loadings extracted by the exploratory factor analysis (EFA). Factor loadings should exceed the value of 0.7 [24]. On the basis of factor loadings extracted using Principal Component Analysis, which is a method used to determine the indicators of the dimension, content validity was examined and ensured since items (1-20) were loaded on four factors; factor 1 (green recruitment), factor 2 (green performance measurement), factor 3 (green training and development) and factor 4 (green pay and rewards). Five items were related to each factor. Discriminant validity, on the other hand, was assessed by average variance extracted (AVE). Values of AVE should be greater than 0.5 [25]. Internal consistency was measured by composite reliability (CR) and Cronbach's Alpha ( $\alpha$ ). Values of CR should be 0.7 or above [26].

**Table 2. Results rotated component matrix**

Items	Component				AVE	CR	$\alpha$
	1	2	3	4			
Q10	<b>0.812</b>	0.002	0.102	0.125	0.602	0.883	0.856
Q4	<b>0.801</b>	0.102	0.227	0.224			
Q12	<b>0.787</b>	0.155	0.123	0.001			
Q5	<b>0.765</b>	0.004	0.028	0.201			
Q1	<b>0.711</b>	0.051	0.128	0.025			
Q2	0.021	<b>0.882</b>	0.292	0.109	0.582	0.873	0.847
Q3	0.016	<b>0.754</b>	0.134	0.091			
Q17	0.168	<b>0.741</b>	0.116	0.137			
Q15	0.277	<b>0.722</b>	0.300	0.118			
Q11	0.334	<b>0.701</b>	0.033	0.096			
Q19	0.200	0.007	<b>0.933</b>	0.140	0.622	0.891	0.860
Q13	0.114	0.139	<b>0.824</b>	0.179			
Q16	0.250	0.214	<b>0.733</b>	0.157			
Q20	0.346	0.107	<b>0.721</b>	0.175			
Q14	0.110	0.003	<b>0.711</b>	0.208			
Q9	0.234	0.203	0.004	<b>0.749</b>	0.527	0.848	0.808
Q7	0.073	0.152	0.228	<b>0.739</b>			
Q8	0.271	0.211	0.132	<b>0.727</b>			
Q6	0.007	0.001	0.150	<b>0.713</b>			
Q18	0.153	0.213	0.128	<b>0.701</b>			

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

## E. Means, standard deviation and correlations

Results in Table 3 shows means, standard deviations and correlation coefficients among study variables. It was revealed that industrial companies moderately adopt GHR practices, mean values were ranged from 2.99 to 3.65. Correlation coefficients between independent variables ranged from 0.29 to 0.61 and indicated significant correlations between those variables. However, no multicollinearity problem was noted. Correlations between independent and dependent variables showed that green

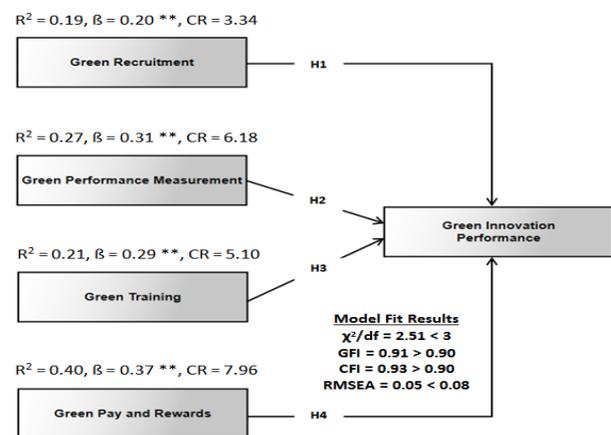
recruitment ( $r = 3.51$ ), green performance measurement ( $r = 3.55$ ), green training ( $r = 2.99$ ), green pay and rewards ( $r = 3.65$ ) were related to green innovation performance.

**Table 3. Means, standard deviation and correlation coefficients**

	M	SD	GR	GPM	GT	GPR	GIP
GR	3.51	0.41	<b>1.00</b>				
GPM	3.55	0.59	0.33*	<b>1.00</b>			
GT	2.99	0.61	0.37*	0.40*	<b>1.00</b>		
GPR	3.65	0.52	0.29*	0.39*	0.41*	<b>1.00</b>	
GIP	3.53	0.48	0.44*	0.52*	0.46*	0.63*	<b>1.00</b>

## F. Structural model fit and coefficients

Maximum likelihood method was used to estimate the model. Chi-square ratio to degrees of freedom ( $\chi^2/df$ ), the goodness of fit (GFI), and the comparative fit index (CFI), as well as the root mean square error of approximation (RMSEA) were used to evaluate the overall fit of the model. The structural model shown in Figure 2 displays fit statistics, standardized path coefficients, critical ratios (CR) and significance level associated with CR values. The figure shows that green recruitment has a significant impact on green innovation performance ( $\beta = 0.20$ ,  $CR = 3.34$ ,  $P < 0.05$ ), green performance measurement has a significant impact on green innovation performance ( $\beta = 0.31$ ,  $CR = 6.18$ ,  $P < 0.05$ ), green training has a significant impact on green innovation performance ( $\beta = 0.29$ ,  $CR = 5.10$ ,  $P < 0.05$ ), green pay and rewards has a significant impact on green innovation performance ( $\beta = 0.37$ ,  $CR = 7.96$ ,  $P < 0.05$ ).



**Figure 2. The structural model**

## IV. DISCUSSION, CONCLUSION AND RECOMMENDATIONS

The present study aimed to identify the adoption of GHR the practices in industrial companies using four practices: green recruitment, green performance measurement, green training and development, and green pay and rewards. The second aim of the study was to test the impact of GHR practices on green innovation performance, measured by product and process innovation.

The study found that industrial companies apply green practices at a moderate degree. It was also found that GHR practices have a significant and positive effect on green innovation performance.

The most important point that the study tries to focus on is that the low or moderate degree of applying GHR practices does not mean that companies are not committed to environmental issues. Companies, as the study findings show, offer environmental initiatives under the direct guidance of senior management. Perhaps the reason for the moderate degree of application is that corporate departments see the first focus on the financial goals they seek to achieve by relying on employees and leave attention to other issues to the management that carries out green activities in their own way. In other words, if the company seeks to attract employees in a particular industry, it focuses on the skills and experience that the employee has in the field of work and does not require the applicant to have a knowledge and experience in environmental management. On the other hand, it can be said that some companies have a specialized unit in environmental issues, which issues instructions and submit proposals for the production processes and other activities.

Green recruitment has a significant impact on green innovation performance. According to [18], the application of green recruitment is related to selecting candidates who are committed to environmental sustainability. Kūçūkoğlu (2018) argued that environmental innovation is associated with the reduction of the negative impacts of the products and production process[27]. In the current study, candidates who are aware of the environmental behavior of the company more able to make significant contributions to the company in green manufacturing. Green performance measurement was found to have a significant impact in green performance innovation. Arulrajah et al. (2015) defined green performance of employees as employees' involvement in activities related to greening efforts[1]. Employee accountability in response of doing these activities encourages employees to provide innovative ideas that will achieve the environmental goals of the organization through the improvement of green processes that lead to green products. Hence, a green assessment of employee performance plays an important role in improving green innovation performance.

In the current study, green training was found to have a significant impact on green innovation performance. Teixeira et al. (2016) defined green training as a type of on the job training related to the environmental management that enables managers and employees to integrate environmental issues into company performance[28]. Prior training in environmental issues has a significant impact on the environmental performance of companies[29]. Finally, the findings of this study suggested a significant impact of green pay and rewards on green innovation performance. Jabbour(2011) indicated that the aim of green pay and rewards is to attract employees and encourage them to do their best in respect of achievement of the environmental goals of the company[21]. According to Laursen and Salter (2006), great rewards is positively associated to innovation performance[30].

## V. LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

The study focused on the impact of GHR practices on green innovation performance using four practices; green recruitment, green performance measurement, green training, and green pay and rewards, future studies should extend these practices. The study was conducted using a sample of industrial companies in Jordan and did not identify the differences between companies according to the characteristics of the company, such as size and the nature of its sub-industrial sector. It is therefore recommended that future studies should test such differences. Finally, factors that encourage companies to adopt GHR practices were not investigated in the present study, and therefore a future study is recommended.

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