

RESEARCH ARTICLE

Green human resource management: Development of a valid measurement scale

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Abstract

The objective of the study was to develop a valid measurement scale for green human resource management (HRM). Even though the common practices of green HRM have been presented in much of the literature, the previous studies focused only on a small number of functions in integrating environmental management with HRM. Additionally, the measurement of green HRM practices still calls for empirical validation. The two-stage methodology of structural equation modeling in AMOS was employed for data analysis. Exploratory factor analysis revealed seven dimensions of the construct measured by 28 items. Confirmatory factor analysis confirmed the factor structure. The measuring instruments revealed convergent and discriminant validity. Several model fit indices indicated the model fitness. The study provided supplementary evidence on the underlying structure of the construct that can be valuable to researchers and practitioners in this area.

KEYWORDS

confirmatory factor analysis, convergent validity, discriminant validity, environmental management, exploratory factor analysis, fit indices, human resource management, structural equation modeling

1 | INTRODUCTION

Sustainability and environmental protection is currently a global concern. Organizations are allocating more resources to tackle environmental problems (Paillé, Chen, Boiral, & Jin, 2014). Corporations primarily want to stabilize the industrial advancement and demand environmental management (Daily & Huang, 2001). Environmental management is the approach embraced by a company to establish the environmental management policies and strategies for resolving environmental issues (Lee, Kang, Hsu, & Hung, 2009). It contains environmentally conscious practices of green organizations (Pane Haden, Oyler, & Humphreys, 2009). The development of green management took place as a result of implementation of environmental management practices that offered diverse benefits to organizations (Molina-Azorín, Claver-Cortés, López-Gamero, & Tarí, 2009; Wagner, 2007). A few advantages related to this implementation included decrease in total expenses, increased collaboration, better operating performance, and enrichment in business values and principles (Hart, 1997; Jabbar & Abid, 2014).

In the framework of environmental protection, effective green management requires significant human resources (HR; Daily & Huang, 2001). Aligning HR functions with environmental management goals can aid in the effective design and implementation of environmental management (Jabbour & Santos, 2008; Jackson, Renwick, Jabbour, & Muller-Camen, 2011). Green human resource management (GHRM) is defined as the incorporation of green management elements into job design, staffing, training and development, motivation, and maintenance functions of human resource management (HRM) to improve employee pro-environmental behavior, meet employee expectations, and achieve organizational objectives. Uddin and Islam (2015) pointed out that HRM can play a useful role in promoting environmental management activities. HRM has additional scope and potential to increase organization's pro-environmental performance. Taylor, Beechler, and Napier (1996) generalized that workers accepted culture of green management when organizations provided incentives in the form of green rewards. Employees were inspired and came up with novel waste reduction opinions when offered incentives (Denton, 1999). Dechant and Altman (1994) found that employee perceptions



were vital and were keen toward working in a company that will improve their value profile. A firm pro-environmental stance improves its attractiveness toward applicants (Bauer & Aiman-Smith, 1996). Further, applicants' intention to work with ecofriendly firm was greater together with higher acceptance of employment offer. To carry out the extra responsibility of contributing in environmental work required the provision of rewards and reinforcement (Forman & Jorgensen, 2001). Organizations must adopt an approach of attaining the most of HR to achieve green objectives. Mishra, Sarkar, and Kiranmai (2014) argued that it is essential to incorporate green concept into HRM.

Even though the common practices of GHRM have been suggested in much of the literature, the previous studies narrowly measured the functions and practices of GHRM. Nevertheless, the dimensions of GHRM calls for empirical validation. Thus, the development of a valid measurement scale was essential for further research in this subject. It will help to provide an in-depth understandings of its implications for environmental management and individual or organizational performance. This study was carried out with the objective to develop and validate a measurement scale for GHRM.

2 | LITERATURE REVIEW

2.1 | Green human resource management

Roome (1992) stated that the ability to manage the environmental issues is restrained by the approach adopted by organizations to tackle environmental issues and organize their resources. In the era of environmental management, GHRM has become the buzz word. The number of studies on greening of management increased in 1990 (Hale, 1995; Wehrmeyer, 1996). The principal reason for this increase was the launch of International Organization for Standardization 14000 and the growth of green management system (Chan, 2011; Jabbour & Santos, 2008). With large number of scholarly work on green management (Daily & Huang, 2001; Govindarajulu & Daily, 2004), it became evident that business needs the support of HRM. Wehrmeyer (1996) conducted the groundbreaking work on GHRM in his book "Greening People." Daily and Huang (2001) specified that HRM support was vital to green management implementation. Jackson et al. (2011) asserted that the deliberate contribution of HR in strategic planning activities is necessary for corporate environmental management practices.

GHRM revealed the HR side of environmental management (Renwick, Redman, & Maguire, 2013). Opatha and Arulrajah (2014) defined GHRM as the practices related to the formation, implementation, and sustaining of a structure that make employees pro-environmental. It involves changing the usual workforce to green workforce to accomplish green objectives and participate in environmental sustainability. To Rani and Mishra (2014), GHRM is the process of utilizing every worker interface in a way that encourage and maintain practical corporate exercises as well as creating awareness. The practices of high-commitment, high-performance, and strategic HRM have been embraced by the concept of GHRM. Mishra, Sarkar, and Kiranmani (2014) theorized that it is composed of a system of specific

HRM practices that shows a company orientation toward environmental safety. According to Boiral (2002), GHRM focuses on the uncertainty of environments and the environmental consequences of firms' commercial actions. The current study also developed a definition of GHRM based on study findings. GHRM is defined as the incorporation of green management elements into job design, staffing, training and development, motivation, and maintenance functions of HRM to improve employee pro-environmental behavior, meet employee expectations, and achieve organizational objectives. Through this definition, we delimited the domain of the construct to generate representative measuring items. The objectives of HRM are twofold (Shah & Aman, 2019): first, to achieve organizational objective and, second, to meet employee expectations. Incorporating green management aspects in HRM adds a third objective, which is improvement of employee pro-environmental behavior. The previous definitions failed to take into consideration the functional aspect of HRM. They relied on only a few practices of HRM for improving pro-environmental behavior in organization. Employee commitment to and participation in green initiatives may benefit other stakeholders.

2.2 | Functions and practices of GHRM

According to Decenzo and Robbins (2005), HRM comprised four major functions, namely, staffing, training and development, motivation, and maintenance. There are underlying practices associated with these functions. The next section describes how these underlying practices align with the concept of GHRM. The practices were intended to be incorporated in GHRM measurement scale.

2.2.1 | Staffing function

Green job analysis and design

Job analysis is a systematic process through which we analyze job duties, responsibilities, and working conditions as well as the human requirements of a job (Dessler & Tan, 2006). Job description and job specification are the two tangible outcomes of job analysis. A job description is a document that defines job tasks and responsibilities as well as the working conditions of a job. From a green management perspective, it can serve to identify several job duties and responsibilities related to environmental management (Renwick et al., 2013; Renwick, Redman, & Maguire, 2008; Wehrmeyer, 1996). Firms have combined environmental and societal responsibilities and to the best of their abilities in each job to protect the environment. Several companies have incorporated at least one task related to environmental management in job descriptions. Further, job descriptions and job specification must cover tasks related to organizational, environmental, and societal obligations, green reporting, and health and safety responsibilities. Furthermore, certain firms use cross-functional teams to effectively handle the environmental problems of the business (Crosbie & Knight, 1995; Jabbour, Santos & Nagano, 2010; May & Flannery, 1995; Revill, 2000; Wehrmeyer, 1996). Dangelico (2015) argued that the foundation of employee green teams significantly influenced both green reputation and green performance.

Environmental protection duty of a firm require multidisciplinary teamwork. Presently, numerous businesses have created

environment-related ranks to emphasize entirely on green management features of the company. Likewise, several firms have designed their current jobs in a more ecofriendly fashion by integrating green duties and responsibilities.

Green recruitment and selection

Jackson et al. (2011) and Ahmad (2015) regarded green recruitment and selection (GRS) as an essential element of GHRM. Dechant and Altman (1994) found that employee perception was vital and were keen toward working in a company that will improve their value profile. A firm practical outlook toward environmental protection improves firm's attractiveness (Bauer & Aiman-Smith, 1996). Further, applicants' intention to work with ecofriendly firm was greater along with higher acceptance of employment offer. Friedman (2003) claimed that individuals would like to work for pro-environmental companies. The motivation among incumbents to work for the firms was greater toward pro-environmental companies (Brekke & Nyborg, 2008). Further, when incumbents in different firms were offered with parallel wages, they choose to move toward socially responsible firms. Grolleau, Mzoughi, and Pekovic (2012) noted the influence of green criteria of a firm staffing. A firm commitment to environmental management improved its reputation. Guerici, Montanari, Scapolan, and Epifanio (2016) found a significant positive association between recruiting effort and attracting job applicants. The three features of GRS recognized by Renwick et al. (2013) were green criteria to hire applicants, green employer branding, and applicants' green awareness.

Green awareness includes behavioral elements that allow an organization to attain green objectives. Environmental management is eventually enhanced when individuals develop pro-environmental information as a result of operational process (Del Brío, Fernández, & Junquera, 2007). Such individuals are of value to organization in terms of environmental management. Numerous selection tools can be employed to confirm that job incumbents have green awareness and are optimistic about green concerns (Milkovich & Boudreau, 2000). Ehnert, Parsa, Roper, Wagner, and Muller-Camen (2016) referred to green employer branding as a firm's aspect and reputation associated with environmental management that can be developed through GHRM. Applicants can recognize a good fit between a company and their own beliefs through green employer branding (Jones & Willness, 2013). Jabbour (2011) stated that applicants can be attracted to organization with progressive green indicators. Job applicants gather data about a company green performance and are willing to utilize their energy for an organization with proper green atmosphere. Thus, green employer branding is a useful technique of hiring prospective individuals who are positive about green issues. Organizations should use green criteria to evaluate and appoint individuals. Hiring companies can emphasize environmental features in job analysis. Queries associated to green information, standards, and views can be questioned.

2.2.2 | Training and development function

Green training and development

Organizational change activities to manage green problems often used education programs (Jackson, Schuler, & Jiang, 2014; Stalcup, Deale, & Todd, 2014). It exposed green practices and conveyed company values

to notify individuals about desired change throughout the early pursuit of environmental protection. Wiernik, Ones, and Dilchert (2013) postulated that individual behavior can be shaped through intervention-based methods. Such methods direct the philosophy of education and motivation related to learning, development, and organizational change.

Green training (GT) indicates a scheme of events that stimulate workers to acquire environmental protection abilities and pay attention to environmental concerns (Jabbour, 2011). Pellegrini, Rizzi, and Frey (2018) predicted a positive association between GT and in-role and ex-role sustainable behavior. Fernández, Junquera, and Ordiz (2003) reckoned on that employee awareness and skills about green activities can be improved through training. All members of the firm should be trained in green management courses. According to Tang, Chen, Jiang, and Jia (2018), GT involved three elements: knowledge management, green awareness, and environmental protection activities. GT can improve individuals' awareness of pro-environmental actions. Pun, Fung, and Wong (1998) made point that individuals can realize the significance of environmental protection through GT practices. Further, it make them sensitive to environmental control or protection procedures. Firms need to develop specified GT programs tailored to the requirement of a business (Perron, Côté, & Duffy, 2006). Moreover, organizations should utilize validated instruments to assess the consequent training outcomes. The establishment of an efficient and effective green management structure was reliant upon GT (Daily & Huang, 2001). Further, the effective management of GHRM practices required GT initiatives in organization. Environmental management training was significant, but education programs were not very robust. Further, the findings revealed that lack of provision of green know-hows and the absence of upper management support were the main subjects of focus on expanding learning programs (Unnikrishnan & Hegde, 2007).

Del Brío et al. (2007) described GT as part of the company's knowledge management program that assists employees to exercise green practices. Govindarajulu and Daily (2004) asserted that workers developed skills in dealing with difficult environmental issues. Further, employees get training as part of organization knowledge management initiatives that broadens their understanding of environmental protection. Roy and Thérin (2008) claimed that it improves employee know-how of gathering information on environment. Sound environmental training mediated the manifestation of environmental management practices (Sarkis, Gonzalez-Torre, & Adenso-Díaz, 2010). Businesses that encouraged new and actual green management practices constantly delivered a routine environmental management training within organization. Jabbar and Abid (2014) found that talent acquisition, training, motivation, and compensation significantly related to the development of green management values. The commitment level of employees at all levels of organization determined the association of GT and environmental management (Teixeira, Jabbour, & de Sousa Jabbour, 2012). Developing a pro-environmental workplace requires integrated training programs linked to evaluation and performance management.

2.2.3 | Motivation function

Green performance management

Jabbour and Santos (2008) refer to green performance management (GPM) as the practice of appraising individuals' performance through

remunerations in the course of green management practices. Companies need to identify an efficient way of executing GPM. Implementing a general GPM standard is therefore a priority for numerous companies. Tang et al. (2018) reported that GPM is composed of four elements: developing green objectives, creating green indicators, appraising members' green results, and exercising disbenefits.

Clair, Milliman, and Whelan (1996) indicated that developing green objectives involves translating ecofriendly goals into action plans for workforce. Setting green performance indicators requires creation of a set of environmental benchmarks for all employees in appraisal and communication of green guidelines. Performance appraisal was most effective for both executive and staff in influencing the usefulness of compensation (Ahmad, 2015). In the practice of performance management, exercise of vibrant green indicators was crucial. Appraising managers' green results plays a major role in green management, making them responsible for green performance. Individuals who do not meet green performance standards are dealt with disbenefits (Renwick et al., 2013). Disbenefit is a negative measure that may aptly drive individuals to make every effort for environmental objectives in their forthcoming job.

Green compensation management

Mandip (2012) and Jabbour, Santos, and Nagano (2010) referred to green compensation management (GCM) as the practice of using rewards, aimed at hiring and motivating workforce to work toward environmental objectives. A mix of business-specific incentives and benchmarking best practice in industry will stabilize the problems of resource allocation (Lothe & Myrtveit, 2003).

Ramus and Montiel (2005) recognized the significance of non-monetary rewards in influencing strategy execution in European businesses. It was observed that perceived supervisory support and enhanced recognition improved employee commitment toward implementing environmental strategies. Jackson and Seo (2010) predicted that rewards were beneficial when individual performance was linked to company's objectives. According to Jackson et al. (2011), non-monetary rewards such as praise and recognition were significant for motivating employees. Pellegrini et al. (2018) stated that reward positively affected sustainable behavior. Tang et al. (2018) theorized that along with financial incentives, employees should be paid with non-monetary rewards such as green recognition, green tax incentives, and green travel benefits.

Green health and safety

Green health and safety (GHS) covers the old-fashioned health and safety administration and certain other features of environmental management of a company. It includes environmental protection and community livelihood programs. The provision of green workplace for all employees is the central function of GHS management. Businesses constantly devote resources to make various environmental-related initiatives to decrease worker stress and job-related sickness instigated by harmful work setting. Some firms have developed policies to maintain a promising workplace to avoid health issues. Environmental management and its associated cost lead to improvement of employee's health and local communities. Thereby, it improves a firm image as a suitable employer and socially responsible citizen.

2.2.4 | Maintenance function

Green labor relations and employee involvement

In the context of GHRM, employee relations and collective bargaining are essential in executing company environmental management plans and programs. Labor relations and union actions might support member involvement and input in green suggestion activities, problem-solving circles, and workers' experimentation with green ideas (Renwick et al., 2008, 2013).

Florida and Davison (2001) contended that the performance of green management system can be enhanced through employee green involvement (GI). Internal drivers were associated with green consciousness (Chinander, 2001). The development of valuable ecofriendly programs was contingent upon the amount of response that employee receive on particular environmental problem. Organization dedication, individual autonomy, recognition, and reward were important factors to promote efficient green management practices (Govindarajulu & Daily, 2004).

HRM aspects comprising individuals' empowerment, training, teamwork, and environmental management training were associated with company environmental actions (Daily & Huang, 2001). GI comprised five components, namely, green learning environment, green vision, inspiring GI, communication, and supporting green practices (Tang et al., 2018). The staff members should be knowledgeable regarding green matters in organization, which require various communication channels and green learning environment. Green vision is the pattern of principles, which inspire green behavior. It directs individuals toward participation in ecofriendly activities (Harris & Crane, 2002; Renwick et al., 2013). Such an environment inspires individuals to be aware about each other's conduct regarding green initiatives. Various channels of communication can develop a green culture. In such a culture, individuals can develop their green behaviors and awareness.

2.2.5 | Measurement of GHRM

Clair et al. (1996) suggested that GHRM should take account of green idea, training, appraising individuals' green performance, and offering rewards. Improvement in green performance can be determined by providing training on green initiatives, non-monetary rewards, collaboration, considering environmental objectives, and organizational culture (Jabbour & Santos, 2008). Renwick et al. (2008) identified six components of GHRM, namely, recruitment, training and development, performance appraisal, reward management, employment relations, and exit. Sudin (2011) reported that GHRM construct is composed of top management support, recruitment and selection, performance appraisal, training and development, employee relations, and reward system. Meta-analysis of publications on GHRM conducted by Cherian and Jacob (2012) published in *Emerald* and *ScienceDirect* journals during 1992 to 2012 identified four dimensions, which includes recruitment, training and development, reward and compensation, and employee empowerment. Renwick et al. (2013) proposed that the components of staffing and learning on environmental awareness can be incorporated in concept of GHRM. Prasad (2013) proposed six areas where HRM can have green approach.

These included sourcing and acquiring talent, onboarding, induction, learning and development, performance management, and compensation management. Majority of the studies (Cherian & Jacob, 2012; Jabbour et al., 2010; Prasad, 2013; Zibarras & Coan, 2015) ponder that GHRM practices consist of staffing, training and development, performance management, reward, human relations and employee involvement.

Even though the common practices of GHRM have been suggested in much of the literature, considerable number of previous studies narrowly measured GHRM. Such studies were unsuccessful in sufficiently addressing the requirements of organizations' policy makers (Fernández et al., 2003). The outcomes were not comprehensive to demonstrably state a set of effective GHRM practices in industries (Jabbour & Santos, 2008). The multidimensional nature of GHRM should be kept in mind while developing a measurement scale for GHRM (Tang et al., 2018). To describe the level of accomplishment in GHRM, organizations require certain indicators. Thus, it was essential to develop a valid measurement instrument for GHRM. The current study was carried out with the objective to develop and empirically validate a measurement scale for GHRM.

3 | RESEARCH METHODOLOGY

3.1 | Proposed dimensions and measurement items

All possible relevant indicators and measures of GHRM were analyzed and collected through an extensive literature review to create a listing of proposed items measuring various dimensions of GHRM. Through definition, the domain of the construct was delimited to generate representative measuring items. Moreover, the proposed dimensions and associated items were evaluated and affirmed by two assistant professor in management sciences. Seven HRM practices and 81 items measuring these practices were identified and selected, which exhibited actual HRM practices that affect environmental management. The dimensions were clearly stated and explained. All the similar items were then grouped into relevant dimensions of GHRM as shown in Appendix A. The dimension green job design (GJD) was represented by 7 items, GRS by 17 items, green training and development (GTD) by 16 items, GPM by 13 items, GCM by 12 items, GHS by 3 items, and green labor relations (GLR) by 16 items, respectively. All these GHRM measures were then incorporated into a 5-point Likert scale questionnaire. Two assistant professors of management studies agreed on seven HRM dimensions and their measuring items as valid indicators of GHRM construct.

3.2 | Data collection and sampling procedure

Data were collected from 378 respondents. The population of the study consists of 19 International Organization for Standardization certified companies listed on Pakistan Stock exchange. The companies operated in 10 different industries including cement, chemical industry, commercial banks, engineering, investment sector, oil and gas, transport, textile, power generation, and technology and communication. A sampling frame was developed from the population, which

contained the list of potential respondents. The minimum required sample size was 412, which was calculated through (Cochran, 1977) equation " $n = z^2 s^2 / d^2$." However, the method of oversampling was employed to get the desired response rate of 60%. Through equal allocation, 33 organizational members were randomly selected, which gave a sample size of 627 respondents. The link of the questionnaire was mailed to the participants on their official email address. Follow-up of respondents was done through reminders in emails, phone calls, and SMS messages. The response rate was 60%.

4 | RESULTS

4.1 | Demographic features of the participants (N = 378)

The sample consists of 378 managerial level employees of which 18 were female and 360 were male participants. Of the total participants, 69 (18%) were HR professionals, 58 (15%) were top-level managers, 88 (23%) were middle-level managers, and 163 (43%) were lower level managers. In addition, 100 (26%) participants were from small companies having less than 200 employees, 166 (63%) from mid-sized companies having 200 to 1,000 employees, and 112 (29%) from large companies having more than 1,000 employees. One hundred sixteen (30%) participants were having experience of less than 2 years, 175 (46%) participants having experience of 2 to 5 years, 50 (13%) participants having experience of 5 to 10 years, and 37 (0.9%) participants having more than 10 years of experience.

4.2 | Exploratory factor analysis

To explore the factor structure, an exploratory factor analysis with principal component technique (Hotelling, 1933) in SPSS was performed. The Promax rotation method with Kaiser Normalization (Kaiser & Rice, 1974) was employed to identify the linear combination of variables and their respective items. Two criteria were used for retaining items. First, a cutoff value of 0.5 was considered for retaining items. Second was item deletion criteria. The items that loaded on more than one factor should be deleted (Fabrigar, Wegener, MacCallum, & Strahan, 1999; Henson & Roberts, 2006; Osborne & Costello, 2009). Maskey, Fei, and Nguyen (2018) conducted a meta-analysis of 35 articles published from 1999 to 2016 in which majority of the researcher used such criteria. Seven factors were extracted, which accounted for 84% variance in the model. Out of the total 81 items, only 28 items were explored to be associated with seven factors in the model. All the items exhibited factor loadings greater than 0.50, demonstrating acceptable reliability of the scale. Among the items, GPM4 has the highest loading of 0.963 followed by GPM2 (0.925) and GLR2 (0.903). The item GCM6 exhibited the lowest loading of 0.504 followed by JTD8 (0.552) and GJD2 (0.571). No items loaded on multiple factors, which indicated the discriminant validity of the scale. All the items loaded on single factor were significant at $p < 0.01$, which indicated unidimensionality of the construct. The item factor loadings are offered in Table 1, and the explored items in their respective dimensions are presented in Table 2.

TABLE 1 Results of exploratory factor analysis

Constructs	Items	Rotated factor loadings						
		1	2	3	4	5	6	7
GLR	GEI5	0.758						
	GLR1	0.746						
	GLR2	0.903						
GRS	GRS4		0.675					
	GRS5		0.904					
	GRS7		0.751					
GPM	GPM2			0.925				
	GPM4			0.963				
				0.746				
	GPM7			0.871				
	GPM9			0.774				
	GPM11			0.642				
	GPM13							
GCM	GCM2				0.838			
	GCM5				0.711			
					0.504			
					0.637			
	GCM6				0.799			
	GCM7							
	GCM11							
GJD	GJD1					0.774		
	GJD2					0.571		
						0.758		
	GJD5					0.871		
	GJD6							
GTD	GTD4						0.730	
							0.836	
	GTD6						0.552	
	GTD8						0.824	
	GTD13							
GHS	GHS1							0.752
	GHS2							0.647
	GHS3							0.688

Note. GCM: green compensation management; GHS: green health and safety; GJD: green job design; GLR: green labor relations; GPM: green performance management; GRS: green recruitment and selection; GTD: green training and development.

Extraction method: Principal component analysis. Rotation method: Promax with Kaiser Normalization.

Rotation converged in six iterations.

4.3 | Confirmatory factor analysis

A confirmatory factor analysis in AMOS (version 23) was employed to validate and confirm the factor structure. The model fitness was determined through several fit indices, namely, CMIN/DF (Marsh & Hocevar, 1985), goodness of fit index (GFI; Jöreskog & Sörbom, 1989), normed fit index (NFI; Bollen, 1989), root mean square residual (PMR), Tucker–Lewis index (TLI; Bentler & Bonett, 1980), root mean square of approximation (Browne & Cudeck, 1993), and comparative fit index (CFI; Bentler, 1990). Reliability and validity analyses were performed to confirm and validate the factor structure.

4.4 | Reliability and validity analyses

The reliability of construct was determined by assessing the internal and composite reliability of the subconstructs. The Cronbach's α co-efficient of reliability was employed to determine the internal reliability of the scale (Awang, 2012). The results showed that all

Cronbach's α values were greater than 0.70, which approved the internal reliability of the measurement scale.

The critical ratio (CR) values of the subscales were computed to determine the composite reliability of the scale. Hu and Bentler (1999) suggested a CR value of greater than 0.60 as acceptable for appropriate composite reliability of the construct. All the CR values as displayed in Table 3 were greater than the threshold value of 0.60, which demonstrated the composite reliability of construct.

Average variance extracted (AVE; Fornell & Larcker, 1981) was computed for subconstructs of the scale to confirm the convergent validity. Hu and Bentler (1999) considered an AVE > 0.50 as an acceptable value. All the subconstructs demonstrated AVE values greater than the standard value of 0.50 as showed in Table 3, which indicated that the scale demonstrated convergent validity. Moreover, Chin, Gopal, and Salisbury (1997) suggested the criteria that all factor loading of items should be significant and greater than 0.60. All the items exhibited significant factor loadings, which were greater than 0.60. This demonstrated the convergent validity of the scale.

Fornell and Larcker (1981) and Hair, Black, Babin, Anderson, and Tatham (2006, 2010) suggested the criteria for determining

TABLE 2 Dimensions and their measurement items

Dimensions	Measuring items
GJD	JD1: My company has integrated several environmental protection responsibilities in each position. JD2: My company has included green and social needs of the company in job description and specification. JD5: My company has incorporated green capabilities as a distinctive element in job specification. JD6: My company has designed and executed innovative positions to emphasize on environmental protection aspects.
GRS	RS4: Our company has incorporated "green aware" criteria in HR staffing policy. RS5: My company practices the use of paperless recruitment and selection process. RS7: We appeal to green job applicants who practice green criteria choose employer (green employer branding).
GTD	TD4: My company assesses who need training in environmental management. TD6: My company evaluates whether the incumbent has manager and peer support to apply the learned content on the job. TD8: My organization uses environmental protection elements as the central themes of green training. TD13: My organization delivers environmental management training to improve employee awareness, skills, and know-how in environmental management.
GPM	PM2: Our company establishes green targets, objectives, and duties for each employee across organization. PM4: In my company, there is communication of green goals. PM7: The use of green criteria to evaluate performance. PM9: My company keeps track of non-compliance or not meeting green objectives. PM11: My company reinforces compliance of meeting environmental goals. PM13: Identification of "Green Superstars" (remarkably talented individuals who perform beyond the standards) and distribution of prizes based on their green contributions.
GCM	CM2: Our compensation system recognizes and rewards contributions in environmental protection. CM5: My company rewards green skills acquisition CM6: My company rewards for learning a green curricula. CM7: My company uses non-monetary rewards for contributions in environment management such as paid time off, special leave, and gifts to employees and their families. CM11: My organization recognizes green initiatives of employees via organization wide publicity and public praise.
GHS	HS1: My organization provides green workplace for all. HS2: My organization takes green initiatives to decrease worker anxiety and work-related sickness instigated by harmful work setting. HS3: My organization develops and executes strategies to sustain a favorable work setting to avoid several fitness problems to develop health and safety of workforce.
GLR	EL5: Our company emphasizes a culture of environmental protection. Offering green practices. LR1: My organization offers opportunities to individuals to take part in green suggestion schemes. LR2: My organization presents green whistle-blowing and helplines.

Note. GCM: green compensation management; GHS: green health and safety; GJD: green job design; GLR: green labor relations; GPM: green performance management; GRS: green recruitment and selection; GTD: green training and development; HR: human resource.

discriminant validity of the scale, that is, $CR > AVE > MSV$ (maximum shared variance) and squared correlation $> MSV$. The results of the validity analysis showed that the values of $CR > AVE$ and MSV and the square of correlation of each dimension were greater than its MSV value as presented in Table 4. Thus, the scale met the criteria of discriminant validity.

The questionnaire was also presented to two assistant professors in management studies. The professors studied the subject matter of the scale and suggested minor changes. Further, they validated the content of the questionnaire.

4.5 | First-order factor analysis

Structural equation modeling in AMOS was used to perform first-order factor analysis of the seven dimensions, namely, GLR, GRS, GPM, GCM, GJD, GCD, and GHS. The model fitness was analyzed through good of fit criteria. All the model fit indices met the threshold values: $CMIN/DF = 1.283$, $GFI = .923$, $PMR = 0.28$, $CFI = 0.964$, $NFI = 0.938$, $TLI = 0.958$, and $RMSE = 0.048$. While conducting the analysis, the parameters of one of the items of each of the seven dimensions was constrained to 1.0 to estimate standardized estimates of all other items. As evident in Figure 1, all the items

displayed factor loadings greater than 0.50. Similarly, the correlation among seven dimensions was also computed. The highest correlation was between GJD and GHS ($r = 0.99$) followed by GLR and GRS ($r = 0.97$) and GPM and GTD ($r = 0.93$). The lowest correlation was between GRS and GPM ($r = 0.72$) followed by GLR and GPM ($r = 0.76$).

4.6 | Second-order factor analysis

In AMOS, a second-order factor analysis was executed. A latent factor GHRM was inserted in the first-order model to see the correlation among seven dimensions. Numerous fit indices were used to analyze the model fitness. All the fit indices values satisfied the criteria of model fitness: $GFI = 0.916$, $NFI = 0.903$, $CFI = 0.930$, $TLI = 0.924$, $CMIN/DF = 1.326$, $PMR = 0.042$, and $RMSE = 0.053$. To obtain the standardized factor loadings of all items, the parameters of one of the item of each subconstruct was constrained to 1. As depicted in Figure 2, the regression weight between the latent construct GHRM and all the factors was significant ($p < 0.01$). The factor GRS demonstrated the highest factor loading of 0.98 followed by GTD (0.95), GCM (0.93), GJD (0.92), GLR (0.91), and GPM (0.86), respectively.

TABLE 3 Cronbach's α , CR values, and items factor loadings of subconstructs

Dimensions	Items	Factor loadings	Cronbach's α	CR
GLR	GEI5	0.758	0.96	0.946
	GLR1	0.746		
	GLR2	0.903		
GRS	GRS4	0.675	0.93	0.956
	GRS5	0.904		
	GRS7	0.751		
GPM	GPM2	0.925	0.92	0.970
	GPM4	0.963		
	GPM7	0.746		
	GPM9	0.871		
	GPM11	0.774		
	GPM13	0.642		
GCM	GCM2	0.838	0.95	0.979
	GCM5	0.711		
	GCM6	0.504		
	GCM7	0.637		
	GCM11	0.799		
GJD	GJD1	0.774	0.94	0.976
	GJD2	0.571		
	GJD5	0.758		
	GJD6	0.871		
GTD	GTD4	0.730	0.92	0.921
	GTD6	0.836		
	GTD8	0.552		
	GTD13	0.824		
GHS	GHS1	0.752	0.90	0.912
	GHS2	0.647		
	GHS3	0.688		

Note. AVE: average variance extracted; CR: critical ratio; GCM: green compensation management; GHS: green health and safety; GJD: green job design; GLR: green labor relations; GPM: green performance management; GRS: green recruitment and selection; GTD: green training and development.

$$CR = (\sum K)^2 / [(\sum K)^2 + (\sum 1 - K^2)].$$

5 | DISCUSSION

5.1 | Conclusion

The findings revealed that GHRM is a multidimensional construct composed of seven dimensions, namely, GJD, GRS, GTD, GPM, GCM, GHS, and GLR, which can be measured by 28 items. Among the seven dimensions, four dimensions, namely, staffing, training and development, performance management, and reward management, were

accepted and suggested by numerous previous studies (Mishra et al., 2014; Paillé et al., 2014; Renwick et al., 2008; Tang et al., 2018). Previously, several studies (Cherian & Jacob, 2012; Clair et al., 1996; Jabbour et al., 2010; Jabbour & Santos, 2008; Prasad, 2013; Renwick et al., 2008; Tang et al., 2018; Zibarras & Coan, 2015) explained the key components of GHRM and emphasized the development of GHRM scale. Clair et al. (1996) observed that GHRM contained green idea, training, appraising individuals' green performance, and offering remunerations. Improvement in green performance was determined by providing training on green initiatives, non-monetary rewards, collaboration, considering environmental objectives, and organizational culture (Jabbour & Santos, 2008). Renwick et al. (2008) identified six components of GHRM, namely, recruitment, training and development, performance appraisal, reward management, employment relations, and exit. Sudin (2011) revealed that the GHRM construct is composed of top management support, recruitment and selection, performance appraisal, training and development, employee relations, and reward system. Meta-analysis of publications on GHRM conducted by Cherian and Jacob (2012) published in *Emerald* and *ScienceDirect* journals during 1992 to 2012 identified four dimensions, which includes recruitment, training and development, reward and compensation, and employee empowerment. Renwick et al. (2013) concluded that the components of staffing and education on environmental awareness can be incorporated in the concept of GHRM. Prasad (2013) found six areas where HRM can have green approach. These included sourcing and acquiring talent, onboarding, induction, learning and development, performance management, and compensation management. Tang et al. (2018) developed a GHRM scale in the context of China, which consists of five constructs, namely, GRS, GT, GPM, GPR, and GI. The developed scale was theoretically justified in previous literature and empirically validated.

5.2 | Discussion and implications

The current study adds to the shared knowledge on GHRM by offering supplementary evidence on the underlying structure of the construct. Previous researches (Dechant & Altman, 1994; Jabbour, de Sousa Jabbour, Govindan, Teixeira, & de Souza Freitas, 2013; Jackson et al., 2011; Mishra et al., 2014; Paillé et al., 2014; Renwick et al., 2013; Taylor et al., 1996) emphasized the incorporation of green

TABLE 4 Results of validity analysis of the construct

Dimensions	CR	AVE	MSV	GLR	GRS	GPM	GCM	GJD	GTD	GHS
GLR	0.946	0.746	0.087	0.864						
GRS	0.956	0.784	0.209	0.295***	0.885					
GPM	0.970	0.844	0.131	0.153**	0.069	0.918				
GCM	0.979	0.904	0.131	0.268***	0.157**	0.362***	0.951			
GJD	0.976	0.909	0.075	0.273***	0.127*	0.027	0.090 ^a	0.953		
GTD	0.921	0.746	0.209	0.286***	0.458***	0.113*	0.213***	0.177***	0.864	
GHS	0.912	0.779	0.075	0.211***	0.074	0.028	0.107*	0.084	0.274***	0.883

Note. CR: critical ratio; GCM: green compensation management; GHS: green health and safety; GJD: green job design; GLR: green labor relations; GPM: green performance management; GRS: green recruitment and selection; GTD: green training and development.

$$AVE = \sum K^2 / n. CR = (\sum K)^2 / [(\sum K)^2 + (\sum 1 - K^2)].$$

Significance of Correlations: * $p < 0.050$; ** $p < 0.010$; *** $p < 0.001$.

^aThe underlying mathematical equations showing how AVE and CR values were calculated.

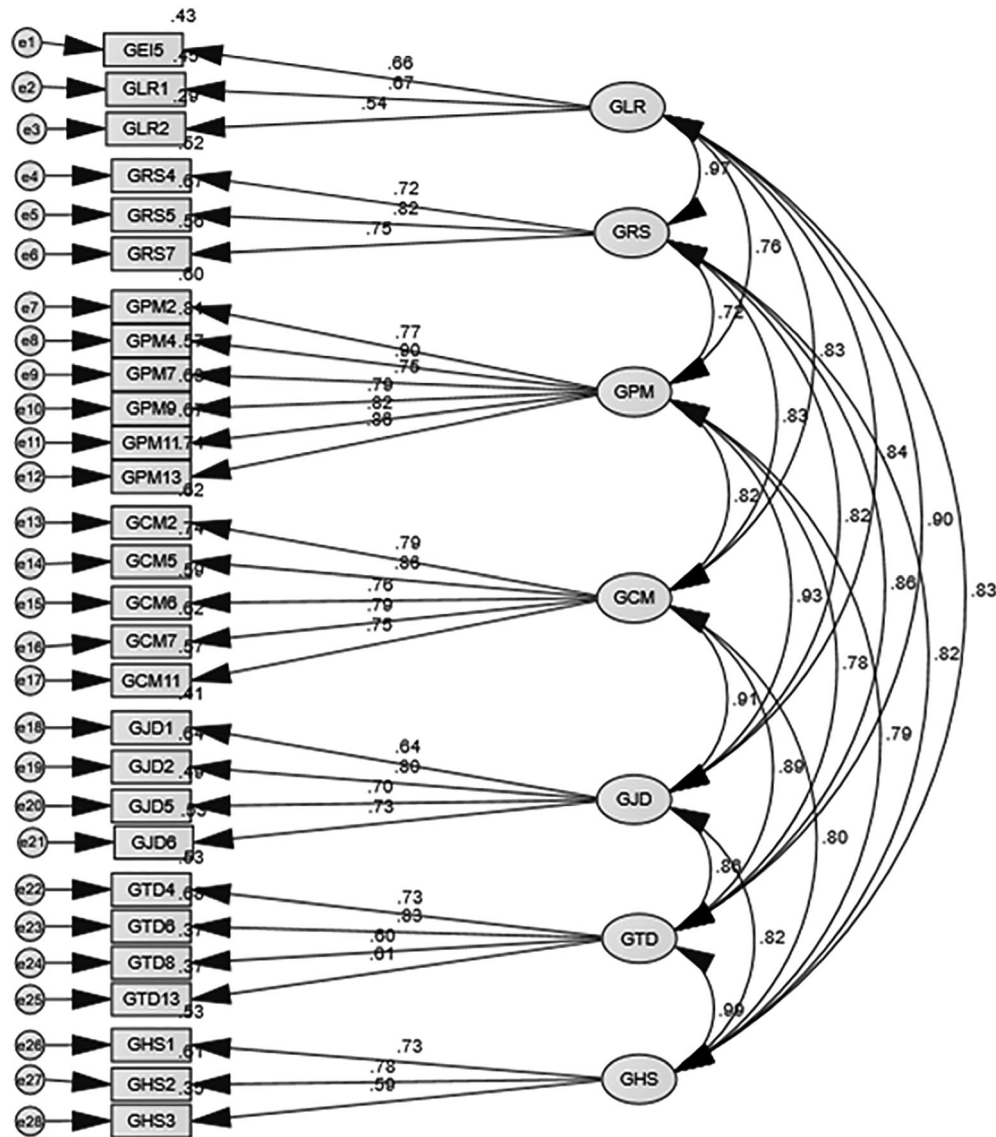


FIGURE 1 First-order model of green human resource management. GCM: green compensation management; GHS: green health and safety; GJD: green job design; GLR: green labor relations; GPM: green performance management; GRS: green recruitment and selection; GTD: green training and development

components into HRM and confirmed the significance of HRM in environmental management. The current study revealed that GHRM is a multidimensional construct that consists of seven components, namely, GJD, GRS, GTD, GPM, GCM, GHS, and GLR, which are measured by 28 items.

The GJD dimension emphasize the incorporation of green elements into jobs. It calls for an integration of environmental protection duties in each position, emphasizing its actual practice in organization. Organizations should include its green and social requirements in job descriptions and job specifications. Renwick et al. (2013) proposed that hiring companies can stress environmental features in job descriptions and specifications. Job specification should include green capabilities as a distinctive elements. Moreover, a company need to design innovative roles and positions to give emphasis to environmental protection aspects.

GRS highlighted that environmental management should be an essential element of a company strategic and HR planning process. This requires the development of strong progressive vision to direct

individuals' activities in environmental protection. Achieving environmental protection objectives needs an organization to become a green employer. Ehnert et al. (2016) refer to green employer branding as a firm's image and status associated with green management. Firms develop green brand through green HR practices. Job applicants match and determine a fit between a company's and their own values through green employer branding. It include practices of paperless recruitment and selection process and incorporation of "green aware" criteria in HR staffing policy (Jones & Willness, 2013). Hiring practices should be tailored to attract job applicants who practice green criteria to choose employer. A recruitment policy should be developed to hire individuals who are competent as well as well-informed about environmental protection issues. The scrutiny committee should use green criteria for shortlisting candidates. Organizations should socialize new incumbents in a way to adopt to organizations' philosophy of green awareness.

GTD dimension involves individual and organizational learning activities regarding environmental management. A culture of

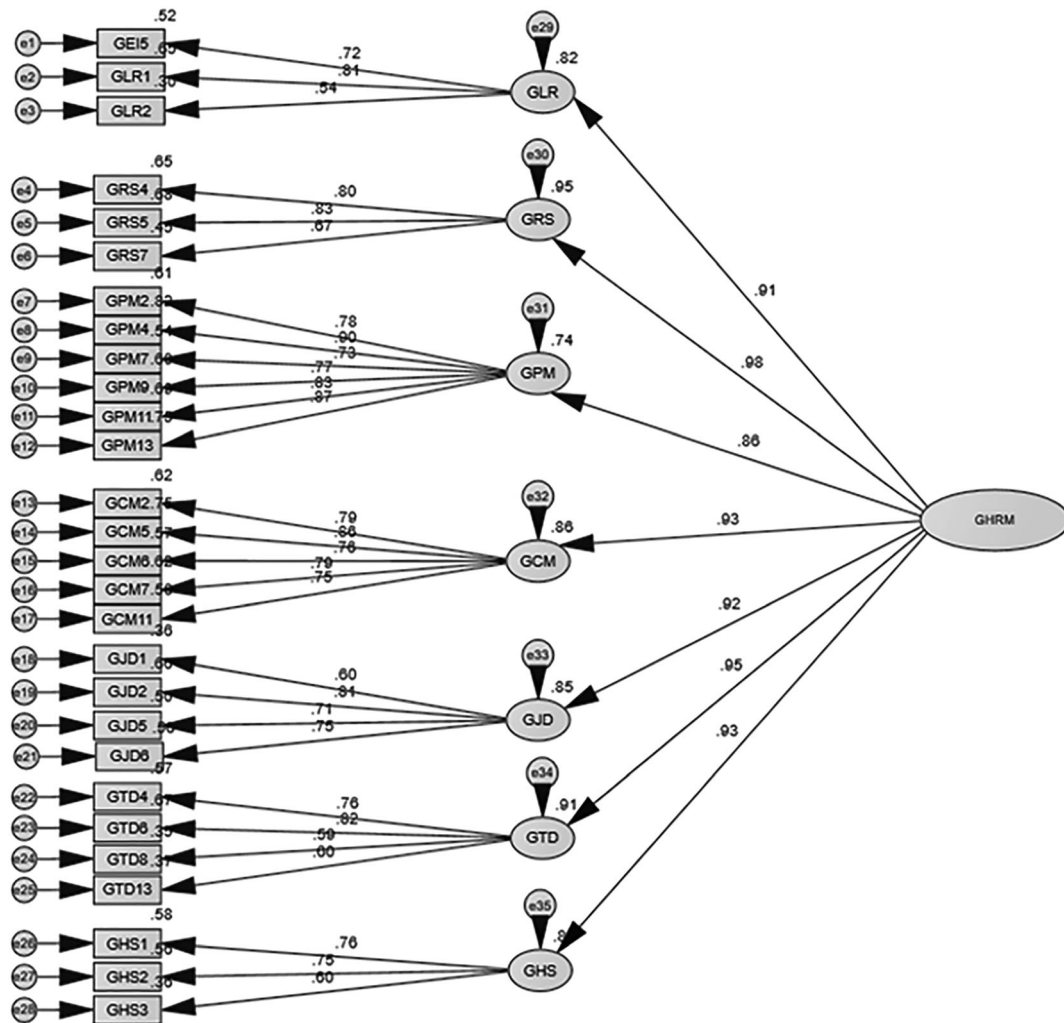


FIGURE 2 Second-order model of green human resource management. GCM: green compensation management; GHS: green health and safety; GJD: green job design; GLR: green labor relations; GPM: green performance management; GRS: green recruitment and selection; GTD: green training and development

environmental protection should prevail by offering a mutual learning environment for green awareness and behavior. An organization that periodically delivers environmental management training can improve environmental mindfulness, abilities, and know-how of workforce. Training needs in environmental management need to be periodically assessed in organization. Organizations can use environmental protection elements as the central themes of GT. Fernández et al. (2003) suggested that employee awareness and skills about green activities can be improved through training. Members of the firm should be trained in green management courses. It should evaluate whether the incumbent has manager and peer support to apply the learned content on the job.

GPM requires the establishment of green objectives for all employees across the organization. Clair et al. (1996) recommended that developing green objectives for all workers highlights transforming environmental objectives into action plans for all workforce. The green goals should be communicated to employees. Green criteria should be used to evaluate employee performance. Ahmad (2015) proposed that vivid green performance indicators were crucial in performance management practice. It should keep a track of non-compliance or not meeting green objectives. The company performance management

system reinforces the meeting of environmental goals. A company identifies "Green Superstars" (remarkably talented individuals who perform beyond the standards) and distributes prizes based on their green contributions. An organization compensation system can be based on recognition and rewarding contributions in environmental protection. A company can reward green skills acquisition or learning a green curricula. The company uses non-monetary rewards for contributions in environment management such as special leave, gifts, paid time off, and family trips. Organizations need to recognize green initiatives of staffs via extensive publicity and public praise. Ahmad (2015) noted that for both executives and staff, the most significant facet of GPM was performance evaluations, which affected the procedure and usefulness of following rewards and compensation.

GHS dimension entails an organization responsibility to offer a green workplace for all. Organizations take green initiatives to decrease worker concern and work-related illness brought about by harmful work setting. It should develop and implement strategies to maintain a favorable work setting to avoid a number of health problems to develop health and safety of workforce. GLR require an organization to provide opportunities to individuals to take part in

green suggestion activities. Organizations should establish a green whistle-blowing system and helplines for grievance handling. Organizations should constantly deliver training to the union members in environmental management and support them in collective bargaining.

5.3 | Limitations and future directions

Findings of the present study are not conclusive, and it would be useful to study the GHRM concept in other contexts and develop a more comprehensive measurement scale for GHRM. One more limitation is that the information was gathered from respondents in a single point of time. It would be valuable to use a case study or longitudinal data to obtain a detailed interpretation of the construct of GHRM. Finally, additional research on the multidimensional nature of GHRM is needed.

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APPENDIX A

DIMENSIONS OF GREEN HRM WITH PROPOSED MEASURING ITEMS

Dimensions	Proposed measuring items
Green job design	<p>JD1: My company has integrated several environmental protection responsibilities in each position.</p> <p>JD2: My company has included green and social needs of the company in job description and specification.</p> <p>JD3: My company utilizes team collaboration as job design method for effectively achieving green targets.</p> <p>JD4: My company has incorporated environmental aspect as a task in job description.</p> <p>JD5: My company has incorporated green capabilities as a distinctive element in job specification.</p> <p>JD6: My company has designed and executed innovative positions to emphasize on environmental protection aspects.</p> <p>JD7: Our organization has incorporated environmental consciousness as a core competency in competency model for talent.</p>
Green recruitment and selection	<p>RS1: In my company, the scrutiny committee use green criteria for shortlisting candidates.</p> <p>RS2: Our company hires individuals who have environmental awareness.</p> <p>RS3: We attract green job applicants, who are competent as well as well-informed about environmental protection issues.</p> <p>RS4: Our company has incorporated "green aware" criteria in HR staffing policy.</p> <p>RS5: My company practices the use of paperless recruitment and selection process.</p> <p>RS6: We perform green practices to attract green job candidates.</p> <p>RS7: We attract green job applicants who practice green criteria to choose employer (green employer branding).</p> <p>RS8: My company makes use of green aspects in testing candidates.</p> <p>RS9: In my company, job candidates are evaluated against green aspects in job interview.</p> <p>RS10: In my company, preference in selection is given to "green aware" candidates.</p> <p>RS11: In our company, orientation programs highlight concern for workers health, safety, and green working conditions.</p> <p>RS12: Our company socializes new incumbents in a way to adopt to organizations' philosophy of green awareness.</p> <p>RS13: My company delivers general green orientation.</p> <p>RS14: My company provides job-specific green orientation.</p> <p>RS15: My company makes job incumbents acquainted with greening initiatives of the organization.</p> <p>RS16: My company inspires incumbents to participate in green interpersonal citizenship behavior.</p> <p>RS17: My company has developed orientation programs presenting environmental protection initiatives of existing employees.</p>
Green training and development	<p>TD1: My company assesses whether organization has budget, time, and expertise for conducting green training.</p> <p>TD2: My company assesses whether employees possess the necessary skills to master the content of the training program.</p> <p>TD3: My company assesses in which green aspects the employee need training.</p> <p>TD4: My company assesses who need training in environmental management.</p> <p>TD5: My company assesses what aspects of environmental management need to be emphasized during the training.</p> <p>TD6: My company evaluates whether the incumbent has manager and peer support to apply the learned content on the job.</p> <p>TD7: My company has incorporated training to develop emotional connection of employees in environmental management.</p> <p>TD8: My organization uses environmental protection elements as the central themes of green training.</p> <p>TD9: We facilitate incumbents to grow and gain awareness in environmental management, green skills, and outlook.</p> <p>TD10: My organization practices knowledge management by developing a culture of knowledge gaining and sharing among employees.</p> <p>TD11: We link environmental protection training and understanding to performance to generate protective solutions.</p> <p>TD12: We design training contents to enhance employee capabilities and awareness in environmental protection.</p> <p>TD13: My organization delivers environmental management training to improve employee awareness, skills, and know-how in environmental management.</p> <p>TD14: My organization extensively uses online and web-based training components and collaborative media.</p> <p>TD15: In my company, job rotation in green tasks is a critical segment of career development plans of managers.</p> <p>TD16: We involve employees in green events and assist them in environmental management learning.</p>
Green performance management	<p>PM1: We develop an understanding and familiarity of green issues across organization.</p> <p>PM2: Our company establishes green targets, objectives, and duties for each employee across organization.</p> <p>PM3: In my company, managers have established goals to attain green targets incorporated in periodic evaluations.</p> <p>PM4: My company focuses on communication of green goals.</p> <p>PM5: My company uses green performance indicators in our performance evaluation.</p> <p>PM6: My company uses green performance standards as a yardsticks in performance evaluation of workforce at all levels.</p> <p>PM7: The use of green criteria to evaluate performance.</p> <p>PM8: We constantly assess and record green incidents in workplace.</p> <p>PM9: My company keeps track of non-compliance or not meeting green objectives.</p> <p>PM10: My company takes into account green incidents while evaluating employee performance.</p>

(Continued)

Dimensions	Proposed measuring items
	<p>PM11: My company reinforces compliance of meeting environmental goals.</p> <p>PM12: Our company performance management system uses disbenefits for non-compliance or not achieving environmental management targets.</p> <p>PM13: Identification of "Green Superstars" (remarkably talented individuals who perform beyond the standards) and distribution of prizes based on their green contributions.</p>
Green compensation management	<p>CM1: My company makes use of monetary rewards for green accomplishments of individuals in organization.</p> <p>CM2: Our compensation system recognizes and rewards contributions in environmental protection.</p> <p>CM3: Our company compensates for green skills acquisition and accomplishments by individuals.</p> <p>CM4: Our company makes use of monetary rewards for contributions in environment management such as salary increase, cash incentives, bonuses, and so forth.</p> <p>CM5: My company rewards green skills acquisition</p> <p>CM6: My company rewards for learning a green curricula.</p> <p>CM7: My company uses non-monetary rewards for contributions in environment management such as paid time off, special leave, and gifts to employees and their families.</p> <p>CM8: My company provides green benefits such as transportation and travelling allowance.</p> <p>CM9: My company provides financial or tax incentives to its employees.</p> <p>CM10: My organization uses recognition-based rewards in environmental management for workforce.</p> <p>CM11: My organization recognizes green initiatives of employees via organization-wide publicity and public praise.</p> <p>CM12: My company appreciates green initiatives of employees.</p>
Green health and safety	<p>HS1: My organization provides green workplace for all.</p> <p>HS2: My organization takes green initiatives to decrease worker anxiety and work-related sickness instigated by harmful work setting.</p> <p>HS3: My organization develops and executes strategies to sustain a favorable work setting to avoid several fitness problems to develop health and safety of workforce.</p>
Green involvement and labor relations	<p>EI1: Our company has a strong progressive vision to direct the individuals' activities in environmental protection.</p> <p>EI2: In our company, employees take part in quality enhancement and problem solving in environmental problems.</p> <p>EI3: My company offers a shared culture of learning for green awareness and behavior.</p> <p>EI4: In our firm, employees are offered opportunities to take part in environment management practices.</p> <p>EI5: My organization stresses values of green safety presenting green practices.</p> <p>EI6: My company encourages green involvement.</p> <p>EI7: Our company uses various formal and informal communication ways to develop green values.</p> <p>EI8: My company has established a focused communications structure, which permits workers to share ideas on worker skills and motivations.</p> <p>EI9: My company promotes feedback, training, and excellence in communications.</p> <p>LR1: My organization offers opportunities to individuals to take part in green suggestion schemes.</p> <p>LR2: My organization has procedure of helplines and green whistle-blowing.</p> <p>LR3: My organization delivers green management training to members of the union.</p> <p>LR4: My organization provides joint sessions in resolving green problems of organization.</p> <p>LR5: My organization provides gain sharing relative to green initiatives or programs.</p> <p>LR6: My organization recognizes union as an important stakeholder in green management.</p> <p>LR7: My organization offers prospects about green workplace agreement to unions for collective bargaining with management.</p>

Note. HR: human resource; HRM: human resource management.

Source: Developed from Clair et al. (1996), Cherian and Jacob (2012), Friedman (2003), Jabbour and Santos (2008), Mishra et al. (2014), Opatha and Arulrajah (2014), Prasad (2013), Renwick et al. (2008), Renwick, Jabbour, Muller-Camen, Redman, and Wilkinson (2016), Sudin (2011), Tang et al. (2018), Uddin and Islam (2015), and Wehrmeyer (1996).