

Green competencies: Construct development and measurement validation

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ABSTRACT

The organisations formulate and implement green human resource management practices to achieve competitive advantage. In green human resource management literature, green competencies has evolved to a significant construct in the recent years. The state-of-the-art literature on green human resource management considers green competencies as an essential requirement for organisation to achieve environmental performance. However, literature lacks construct development and measurement validation regarding the concept of green competencies. In this regard, the study developed a Green Competencies Scale in accordance with the Natural Resource-Based View. Initially, an extensive literature review was conducted to identify the six dimensions of the construct. Subsequently, through fifteen qualitative interviews, the authors matched the literature review with the statements of the respondents and finalised a total of forty items. Later, the Q-sort procedure was conducted to refine the results. Exploratory Factor Analysis was completed to determine the factor structure of the green competencies construct, which is comprised of six dimensions and twenty nine items. After finalising the scale, the partial least square structural equation modelling tool was tested to prove the construct's precision, which reasserted its reliability and validity. To examine the nomological validity, the direct effect of green training on green competencies was examined and the relationship was affirmed. The key finding of the study is that green competencies is a reflective, multi-dimensional scale which comprises of dimensions such as green knowledge, green skills, green abilities, green attitudes, green behaviour and green awareness. The direct relationship between green training and green competencies was evaluated. The theoretical and practical implications of the findings are discussed followed by the future scope and limitations.

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1. Introduction

The organisations can acquire numerous benefits from the implementation of environmental management, especially from the viewpoint of competitive advantage and environmental conservation (Rosen, 2001). This implementation encourages a transformation in the organisation that focuses on sustainable development and integrates business along with protection of the environment. Moreover, environmental management is not only related to the integration of environmental concern within an organisation, it is also associated with opportunities in the organisation to convert the existing production processes and products

so that they become environmentally friendly (Berry and Rondonelli, 1998). Conventionally, the aforementioned activities have been undertaken by different departments such as marketing and operations (Mittal and Sangwan, 2014). But recently, these activities have also been expanded to the Department of Human Resources because of their importance in accomplishing the desired goals of environmental management (Jackson et al., 2011). Similarly, Perron et al. (2006) highlighted the need for integrating the technical aspects of environmental management with other environmental management practices of Human Resources Management and named it Green Human Resource Management (GHRM). The functions of GHRM are comprised of green recruitment and selection, green training, green performance management, a green pay and reward system, and green employee involvement (Tang et al., 2017). Furthermore, green competencies are considered an essential GHRM requirement.

This study provides novel insights and fill the literature gap in

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the GHRM literature. The existing literature discusses about the relationship of GHRM and GSCM (Jabbour and De Sousa Jabbour, 2016; Nejati et al., 2017) and environmental management (Jabbour, 2013; Jabbour et al., 2013a, 2013b; Siyambalapitiya et al., 2018), wherein very few research articles are available which examined the GHRM function like green training (Jabbour, 2015; Teixeira et al., 2016). Furthermore, the literature related to green competencies uncovered major number of papers related to the construct from the viewpoint of green skills, i.e., specifically in the vocational context (Bozkurt and Stowell, 2016; McGrath and Powell, 2016). The studies state that there is ambiguity in the concept of green competencies (Dlimbetova et al., 2015), and furthermore, there is a paucity of study that examines construct development and measurement validation. To date, no effort has been made to formally establish a measurement scale for green competencies, which creates ambivalence and ambiguity around the concept. Hence, this study is first of its kind to address the above mentioned research gaps.

The main purpose of the present study is to formulate and validate a multidimensional and hierarchical scale for ascertaining green competencies, specifically in the context of Indian tourism and the hospitality industry. The first objective of the study involves conceptualisation of the term green competencies and identification of its nature and the dimensions of the construct. The second objective is to develop a scale for measuring green competencies from the employee's perspective in the tourism and hospitality industry. The third objective is to evaluate the psychometric properties of the green competencies scale. The last objective is to inspect the scale's nomological validity and predictive validity by measuring its relationship with the antecedent variable, i.e., green training.

2. Literature review

2.1. Concept of green competencies

Steele (1980) delineated that green competencies are the ability of people to interact with the immediate environment in a way that is constructive and reflective of immense enthusiasm. The study further added that people require three factors to interact with the natural environment. First, the person must be aware about environmental issues and want to protect the environment; hence, their lifestyle should cause minimal harm to the environment. Second, they must have knowledge regarding the basic concepts of the environment. Finally, they are required to maintain skills like the reduction of waste and emissions to ensure environmental protection. Pedersen (1999) posits that green competencies consist of (1) resource conservation, practice skills, and outdoor skills as part of environmental skills, (2) conscientiousness as part of an individual's attitude, style and awareness, and (3) knowledge as well as a way of searching for and developing environmental knowledge. In another study, Corral-Verdugo (2002) discussed green competencies as a higher-order dispositional variable, which consists of environmental perception and motives as well as attitudes, and proved its validity through empirical evidence. The study discussed green competencies as effective responses, green motives, perceptions and beliefs, which were essential to conserve the natural environment. Similarly, Fraijo-Sing et al. (2010) described that green competencies are comprised of two key elements, i.e., environmental knowledge and environmental skills, which need to be employed in accordance with the ecological requirement demanded by the society. In the management literature, Subramanian et al. (2016) asserted that green competencies can consist of two types: artificial and natural. Natural green competencies consist of an innate trait, especially environmental

concern, wherein artificial green competencies consist of dimensions such as knowledge, skills, awareness, and behaviour that pertain to the environment.

2.2. Dimensions of green competencies

Based on an extensive literature review, the researchers arrived at the conclusion that green competencies are hierarchical dispositional constructs that are comprised of green knowledge, green skills, green awareness, green attitudes, green abilities, and green behaviour. The descriptions regarding these dimensions are explained in the following section.

2.2.1. Green knowledge

Green knowledge is defined as “general knowledge about the facts, concepts, and relationship regarding the natural environment and the entire ecosystem” (Fryxell and Lo, 2003, p. 48). The construct is concerned with knowledge related to environmental issues and formulating solutions to solve such issues through the formation of green attitudes and green behaviour (Kollmuss and Agyeman, 2002). Green knowledge is generally viewed into objective green knowledge and subjective green knowledge. The former means the factual green knowledge about environmental issues and latter means the action taken by the person against environmental issues based on knowledge (Pagiaslis and Krontalis, 2014). Green knowledge is valuable to employee as it enable them to be eco-literate i.e. ability to recognise concepts and behaviour which is associated to preservation and conservation of environment (Laroche, 2001).

According to the literature, objective and subjective green knowledge are important to influence the behaviour of university students for being environmental consciousness in the context of emerging and advanced nations (Vicente-Molina et al., 2013). Such environmental capacity is provided to the student through environmental education (Zsóka et al., 2013). Similarly, in case of organisations, it is evident that green knowledge acts as impetus to improve green scepticism and green purchase intention. Green knowledge influences the customers' behaviour and attitude to purchase green products. It relies heavily on impacting state of knowledge about environmental problems, influence of anthropogenic interference in ecosystem and engagement in solving such issues which impacts their attitude and behaviour to buy green products (Goh and Balaji, 2016).

2.2.2. Green skills

Commonwealth Department of Education, Employment and Workplace Relations (DEEWR) (2011) has defined green skill as “the professional and vocational skills, as well as the generic skills (such as sustainable approaches, innovation and problem solving) required for new green jobs and the greening of existing jobs across all industry sectors as a response to climate change and sustainability imperatives” (Brown, 2013, p. 23). The Department for Business Innovation and Skills (2011) stated green skills as ‘vivid skills’ that are required to develop products/services/operations by considering climate change. Vivid skills are the skills for sustainability such as professional skills, vocational skills, and generic skills (e.g. skills required for eco-innovation and problem solving) (CEDEFOP (European Centre for the Development of Vocational and Training), 2012).

As a vital GHRM requirement, green skills serve to ensure the positive impacts of implementing environmental management system which involves supporting education for sustainable development and improve pro-environmental activities (Kanyimba et al., 2014). Imbibing green skills among workforce, ensures sustainable operations in an organisation. The construct is helpful to

achieve green ability and above all acts as a catalyst for improving the financial and environmental performance (Wu et al., 2016). Such skills are geared towards not only to analyse and synthesise the knowledge, but also to ascertain the existing information on various environmental challenges and to further solve such challenges through the necessary course of action (Karimzadegan and Meiboudia, 2012).

2.2.3. Green abilities

Abilities can be referred as the innate capacity that ease the learning and results in improved job performance (Goffin and Woycheshin, 2006). In the management literature, it is well known that through human resource management practices, the abilities of the employees are enhanced. Green abilities is the dimension in GC that enable the employee to develop their capacity (Gerhart, 2005). In the same sense, green abilities support an employee to develop themselves and enhance their performance to achieve environmental conservation. The dimension is the key determinant to achieve green human resource management innovation in the organisation (Rajiani et al., 2016).

Green abilities signify the ability of the employees not only to promote altruism which is considering well-being of co-workers but also to develop biospherism by exhibiting green behaviour in the organisation (Rajiani et al., 2016). Bürgener and Barth (2018) examined the sustainable competencies in the context of teacher education and state green abilities involve recognition of conflict of interest among associated parties, selecting the relevant subject to evaluate the aptitude in sustainability dimensions and its relevance, providing access to students about sustainability dimensions and facilitating tasks and problem to solve and learning opportunities for sustainable development. In the case of hospitality industry to achieve sustainability, facilitating green abilities among employees enable them to assist local communities on ecotourism initiatives for their subsistence. In return, local communities cooperate in such conservation activities wherein they have environmental education which provide consciousness about the usefulness of nature and economic benefit of environmental conservation (Das and Hussain, 2016).

2.2.4. Green awareness

The literature has viewed green awareness in various context such as awareness about the consequences of air pollution (He and Liu, 2018), awareness of customers about the production process and the carbon footprint (Garcia et al., 2019), awareness about energy consumption in production process (Shrouf et al., 2017), and awareness of environmental risk and cost-benefit (Peng and Liu, 2016). Green awareness in the organisation enables the employees to be concerned about their adverse effect on the environment and they are likely to initiate action for mitigating such negative impacts (Gadenne et al., 2009).

Green awareness was considered to be a vital factor to implement environmental management systems in the organisation. Such effective steps are required to initiate sustainable as well as responsible decision for the business organisation (Perron et al., 2006). In the context of construction industry, Sakr et al. (2010) asserted the role of green awareness in supporting environmental management system to reduce environmental degradation and results in sustainable development. In their study on natural reserves located in Nicaragua, Somarriba-Chang and Gunnarsdotter (2012) identified the role of green awareness among local communities that depend on natural resources who are adjacent to ecotourism sites. The authors found that green awareness enables the local communities to participate in biodiversity conservation. Similarly, Kirstges (2002) examined the impact of ecotourism on a nation's economy and stated that green awareness is a vital factor

in achieving sustainability in tourism and helps the tourists to visit the appropriate ecotourism site.

2.2.5. Green attitude

Attitude refers to “the degree to which a person has a favourable or unfavourable evaluation or appraisal of the behaviour in question” (Ajzen, 1991, p. 188). In the context of environmental management, green attitude has been defined as an “individuals’ cognitive assessment of the value of environmental protection” (Lee, 2008, p. 580). Green attitude is a key variable that drives stakeholders to involve in pro-environmental behaviour (Bergin-Seers and Mair, 2009).

Green attitude has been referred as the feelings which includes evaluative action to engage in environmental performance. Several prior studies have investigated the advantages of green attitude in environmental management. The study which is in the context of Information Technology professionals examined the relationship of green attitude and green computing practices, and established the association between the constructs (Ojo et al., 2019). Casaló and Escario (2018) discussed the heterogeneous nature of green attitude and green behaviour wherein stronger the green attitude to protect the environment, stronger the green behaviour exhibited by the employees. Hence, it is critical to create green attitude among the employee. At this point, the importance of environmental education is highlighted wherein such education develops sustainability and environmental consciousness to integrate the pro-environmental traits among the employees (Major et al., 2017).

2.2.6. Green behaviour

Green behaviour is known by various terms such as eco-friendly behaviour, environmentally sustainable behaviour and responsible environmental behaviour (Wang, 2016). From an organisational context, green behaviour is defined as “scalable actions and behaviours that employees engage in that are linked with and contribute to or detract from environmental sustainability” (Ones and Dilchert, 2012, p. 87).

Paço et al. (2019) elaborated this definition by describing such behaviour as usage of green products that is energy efficient, least pollutant, reusable and recyclable. It is alleged that green attitude, green values and green communication as the antecedents for the construct and act as a means to achieve environmental performance. Green behaviour is extended to developing eco-friendly production and regular monitoring of environmental costs which has positive impact on environmental management system and further leads to increase in financial performance (Cheng et al., 2019). Aprile and Fiorillo (2017) discuss about certain circumstances wherein people express green behaviour. Such behaviour is shown as a result of environmental issues such as pollution and resource exhaustion causes threat to their life and welfare.

2.3. Theoretical justification

Green competencies can be viewed within the scope of a Natural-Resource-Based-View (NRBV) (Hart, 1995), which is an extended theory of the Resource-Based-View (RBV). Resource-Based-View postulates that human resources, as a core element which helps an organisation to embrace a sustainable competitive advantage and maximise profits. The theory further adds that a firm's resources and capabilities, which include human resources, are rare, valuable, non-imitable, and substitutable. Hence, they need to be developed not only for a competitive advantage but also for long-term performance (Barney, 1991). Natural-Resource-Based-View addresses the gap present in the Resource-Based-View, which fails to describe the relationship between the organisation and its natural environment. The basic tenant of the Natural-

the generation of 40 items categorised under six dimensions and after the deletion of unmatched or duplicate items. In the later stage of the study, the reliability and validity of the created items was examined. The items that matched the responses of the in-depth interviews and literature reviews are showcased in Table 2.

3.1.2. Item sorting

The domain coverage was examined with the help of two experts, viz., one academican and one manager. The items in the constructs were sorted using a Q-sort procedure (Rosenzweig and Roth, 2007). Q methodology is preferred over R methodology because green competencies is a psychological construct and such methodology is applied to those constructs which are subjective in nature (Cross, 2005). The technique is primarily used for examining the important viewpoints of green competencies. The experts sorted the statements according to the themes and provided their perspective on the topic. Based on their viewpoint, similar statements associated with the constructs were clustered and grouped (McKeown and Thomas, 1988). This procedure is commonly used to understand the different perspectives related to areas, which are complex, disputed, and value laden. Therefore, the procedure was particularly applied in the domain of environmental studies (Dryzek, 2008).

The Q-sort procedure helps to identify the appropriate placement items within the constructs. This procedure ensures necessary proof of content validity among various items in the constructs. Item placement ratio and Cohen's kappa score are used to measure the inter-rater reliability. Item placement ratio has advantages such as easy to calculate and credits raters' independence but fails to consider raters' guess on the scores. On the other hand, Cohen's kappa score accounts the possibility of guess but discredits raters' independence. Hence, both scores are used to rectify the disadvantages of each method (Nahm et al., 2002). The results obtained from the item placement ratio indicate that 31 correct placements were acquired from a total of 40. The individual hit ratio was greater than 75%, which is within the acceptable limit prescribed by Menor and Roth (2007). The Cohen's Kappa score obtained from the analysis was above the threshold limit of < 0.41 (McHugh, 2012). Finally, a sum of 31 items was considered for instrument testing (see: Table 3).

3.2. Instrument testing

3.2.1. Purification of measures

The items generated from the previous stage were transferred into the initial survey questionnaire to conduct the pilot study. The sample of the study was employees of the tour operator in Kerala, India. Back translation method (Brislin, 1970) was applied to translate the English questionnaire to the local language of Kerala, i.e., Malayalam with the help of language experts in the respective field. However, the majority of the respondents in Kerala preferred the English questionnaire, which might be because of the high level of education and knowledge of the English language.

Exploratory Factor Analysis (EFA) was conducted using SPSS software. During the process of conducting EFA, the items with factor loadings less than 0.60 (Green Behaviour 2) and cross loadings (Green Behaviour 3) were dropped. The factor loadings of each item are presented in Table 4. After dropping the items, the authors applied component analysis and varimax mode of rotation of factors. The results revealed that the eigen value of each factor is greater than one, and the values recorded after rotation are 4.741, 4.341, 3.251, 2.591, 2.193, and 2.039 (Hair et al., 2010). The Kaiser-Meyer-Olkin (KMO) index was used to measure the overall sampling adequacy and it was found to be > 0.50, i.e., the value of 0.888 and Bartlett's test of sphericity indicated the validity of the

instrument ($\chi^2 = 4699.016$, $df = 465$, and $p = 0.000$), and the sum of the squared loadings of the six constructs with 29 items resulted in a cumulative variation of 61.793 (see: Table 5).

3.2.2. Model specification

3.2.2.1. Formative or reflective construct. This study followed the guidelines stipulated by Jarvis et al. (2003) to identify whether green competencies are a reflective or formative construct. First, the direction of causality of the literature shows that the dimensions of green competencies were from constructs to indicators. For instance, the dimension of green knowledge was reflected through three items wherein the items are interchangeable, and elimination of an indicator will not alter the domain coverage of the construct. Second, the results of the EFA demonstrated the existence of a positive correlation among items under a construct, which further indicates that the construct is reflective in nature and internal consistency is within the cut-off. Third, it was observed from the extensive literature that the nomological network of the construct of green competencies do not change and are also backed by the existence of the same antecedent and consequent variable. Fourth, there is proof of the unidimensionality of the construct, which is visible during scale refinement. Fifth, the dropping of the items in the scale enhanced the construct validity without affecting its content validity. Based on these arguments, green competencies are reflective construct.

3.2.2.2. Nomological validity. Based on proof from the literature and statistical evidence regarding the structure of green competencies, a model was drafted to validate the scale. The green competencies were comprised of 6 dimensions and 29 items and were used to establish the direct relationship between the constructs, green training and green competencies.

Teixeira et al. (2016) elaborated on green training as a vital element to broaden the competencies of human resources and to transform the world to achieve sustainability. An organisation with a managerial commitment towards improving environmental conservation conducts green training because it equips the employees that are competent enough to engage in environmental improvement activities (Govindarajulu and Daily, 2004). Ramus (2002) elaborated that providing green training, which is comprised of the contents of environmental sustainability issues and policies, may assist the employees to voluntarily be a participant in environmental conservation because the employees are assimilated with green competencies. In fact, green training helps in enhancing green knowledge, green awareness (Fernández et al., 2003), and green skills (Renwick et al., 2013), which gives employees the ability to solve environmental issues in a practical situation by applying the imbibed environmental aspects. Green training is a vital antecedent and it also stimulates employees' attitudes towards engaging in green behaviour (Ramus, 2002). Therefore, green training results in disseminating environmental attributes, such as green knowledge, green skills, green abilities, green awareness, green attitude, and green behaviour, which can be collectively termed green competencies. In summary, it can be asserted that there is a direct and positive impact between green training and green competencies. The conceptual model of the study is shown in Fig. 2.

Hypothesis 1(H1). : Green training has a direct positive impact on green competencies.

3.2.3. Confirmatory analysis

The population of the study includes tour operators who are recognised by the Government of Kerala and are known for conducting sustainable tourism activities. The number of tour

Table 2
Results of the content analysis.

Constructs	Items	Statements
Green Knowledge	The organisation uses less polluting industrial processes and products	"We avoided installing the air conditioner in ecolodge because the sound produced by the a/c compressor may suppress the humming sound of birds." P5
	The organisation has developed a green program (waste management, control of effluents, inventory of pollution sources)	"There is proper waste disposal mechanism within the premises of the property. The accumulated food waste is treated and can be used as bio gas; this bio fuel is also used for day to day purposes." P5
Green Skills	The organisation has developed a drafting of environmental emergency plans and measures	"We have well-trained staff with sufficient knowledge to take care of emergencies during trekking in wilderness. We follow standard procedures and contingency plan to overcome any unforeseen events" P7
	^a The organization promotes Environmental Management Systems (EMS)	"We have environmental policy, planning and implementation of environmental goals. If any diversion happens for such goals, we take corrective actions." P14
	^a The organisation provides skills in recycling	"...when we deliver tickets or other invoice to the customers we avoid delivering in paper or plastic covers, instead we use cloth or jute covers/packets." P4
	The organisation creates skills in energy conservation	"Recently, in our office we have changed high energy consumption lightings and replaced with LED bulbs." P12
	The organisation provides skills in reducing the consumption of materials	"...instead of providing water in plastic bottles, we use glass bottles for giving water to clients. These glass bottles were reused after sterilising measures. Thus, we reduce the consumption of plastic bottles." P3
Green Abilities	The organisation facilitates adequate skills in environmental protection	"We use cars if the number of people is less than four. In case, if there is large number of visitors we surely use coach buses. We do not use several small vehicles to accommodate large groups. We take tourists in coach buses which is not only for security or monetary advantage but also for reducing the harmful effect on ecology through pollution and reducing the traffic congestion." P15
	The organisation enables us to solve simple to complex environmental tasks	"The company provides us all kind of support to sort out the issues which can be large to small." P12
	The organisation helps to find out the several solutions for environmental issues	"We do not limit our ideas by limiting to a single solution rather we brainstorm to find more alternatives and select the best out of it." P14
	The organisation created a platform that makes me to associate different environmental concepts	"Training conducted in the company help us to know about various concepts related to environment and we were able to connect it with real life situation" P13
	^a The employees are able to utilise the knowledge and skill to solve environmental issues	"we provide sufficient education to employees for usage of their expertise to figure out the problems related to environment" P6
Green Attitude	The organisation ensures that the employee can relate the past environmental problem with the new issues	"Our senior staffs are well-versed to solve the new issues arising in the company as they can cite the previous cases and solve the issues within short span of time." P13
	It is essential to promote green living from the part of my organisation	"We will only consider the number of tourists based on the carrying capacity of the destination. For example, if we are taking a group in village, in case, if the group is greater than thirty, we try to divide the group and send them to nearby tourist destinations" P2
	I strongly agree that more environmental protection works are needed from my organisation	"I have learned from the classroom about the aspects such as environmental conservation, protecting the local communities, promoting the handicrafts, and integrating them with ecotourism activities. But, sometimes in the industry, the benefits were diverted to the suppliers not to the local communities. To be frank, I think the company need to stop this economic leakage." P8
	It is very important to raise environmental awareness among employees	"If I perceive that the fresher's who join the firm lacks environmental awareness. We always strive to provide the necessary information to them. It is our responsibility to instantaneously undertake the necessary measures to avoid the future repercussions." P4
	Environmental protection works are not simply a waste of money and resources	"The tourists prefer the destination such as Kumarakom because there are several resorts that support the responsible tourism initiatives. The cost is the major factors that deter large chunk of tourists to visit such destinations. However, we make our effort and spend money for such initiative because we believe the necessity of environmental protection." P9
	Environmental protection issues are our business	"we do not allow any tourism activities that damages nature because we consider protecting environment is important for the well-being of our business" P1
	The organisation think environmental protection is meaningful	"The employees working in the tour operation companies may not behave like other employees who may indulge in polluting the environment. We really know how meaningful and important is to conserve the environment" P15
	It is wise for organisation to spend a vast amount of money on promoting environmental protection	"This company has a total number of 35 properties in Thattakad which provides only ecotourism activities. The occupancy rate is not full but it is sufficient to reach break-even point. However, we value such initiatives because these investments help to protect the environment." P5
	^a The organisation is concerned about the environment	"we are concerned about the plastic menace. Earlier we used to provide plastic carry bags to the guests. Currently, we are providing eco-products which is completely free from resins, and use jute bags." P12
	^a It is important to be conscious about the consequences of climate change	"you may know that recently we were hit by Ockhi cyclone which is a rare incident in Kerala's history. The prime reason for such events are climate change due to absence of environmental protection" P9
Green Behaviour	The employees in organisation try to learn more about the environment.	"Several naturalists would be attending these conferences and while interacting with them we will get several information related to environment. Recently, we have visited the Wayanad with these naturalists, while we were walking in forest, the naturalists showed us several varieties of snails which is an amazing experience." P2
	The organisation find ways of working that are better for the environment.	"We provide only one PET mineral water bottle to the tourists and insists to keep the empty bottle with them. To refill the PET bottle we provide 20 L of water container. The bottle can be refilled from this 20 L jar." P6
	The organisation offer ideas for reducing our impact on the environment.	"We provide necessary awareness to the employees by organising excursion to tourist destinations. There will be interaction between us in the travel and we would discuss our ideas to conserve the environment" P2
	The organisation shares knowledge about the environment with others.	"We markets the property as a nature camp. Before starting of the camping facilities our coordinator provides the necessary briefing to the customers. We state the camp as an ecotourism initiative and nobody is allowed to litter the premises" P5

Table 2 (continued)

Constructs	Items	Statements
	The organisation applies new ideas for reducing our impact on the environment.	"Recently, we are planning to provide paper pens instead of plastic pens and the order has been processed. There is seed embedded inside this pen and after the use this seed can be sowed. It is seed from Agastya (<i>Sesbania grandiflora</i>) which has numerous Ayurvedic capabilities. The doctors insist the necessity of this plant in every household." P7
	^a The organisation creates green processes and products.	"We ask employees to state the services that can be rendered to the tourists from the existing natural environment, which may be free of cost and should not harm or causes any negative impact on environment." P2
	The organisation performs environmental tasks that are not required.	"We do engage in activities other than our core business activities. As part of Clean Kochi Foundation, which is a committee of tourism stakeholders to clean the surroundings of tourist destination such as Fort Kochi" P3
	The organisation questions the practices that are likely to hurt the environment.	"We can see that tress cut down by people in our localities. If it is nearby my locality I will surely initiate action. Whatever it maybe, if it is damaging the environment, I will take an opportunity to question the situation." P4
	The organisation reuses materials.	"There is a need to provide bottled water to the clients which is a necessity that is unavoidable. As a solution to the problem, instead of plastic bottles we gave metallic bottles to the clients that can be reused." P8
	The employees reduce their energy use.	"Even it is in my personal life or official life, I will try to reduce power consumption like reducing the usage of fan or turn off after its use. I also felt the need to conserve water, as we see that people turn on the tap and wasting water." P9
	^a The organisation make the employees involved in environmental activities that are not part of their job	"Our employees' participate in initiative such as cleaning the tourist destination - Fort Kochi beach and plant tree saplings as part of World Environmental Day." P6
	^a The organisation has working environment that encourage employees to think about the environment	"We conduct periodical training with qualified trainers and also integrated eco-projects with these sessions. These sessions have enabled the employees to consider environmental conservation." P10
	The organisation supports the employees to solve environmental problems in society	"Transportation facilities in tourist destination creates air pollution. To reduce its impact, we keep old vehicles for particular tenure and it is well maintained. The pollution control measures and documentation were also properly maintained. We also follow nations' vehicle laws and environmental law to reduce the pollution." P11
Green Awareness	The organisation facilitates the use of environmentally friendly products	"As far as gifts are concerned, earlier we were providing gifts made up of plastics. Right now we were providing bamboo made gifts which is not only to protect ecosystem but also to help the poor people who were employed in such jobs." P1
	The organisation encourage the employees recycle	"We do have recycling process. We do not use any plastic or steel bins to dump wastes which is not only in our office but also during tour with clients, instead we use bamboo made baskets." P1
	The organisation creates understanding among the employees to learn about environmental issues	"We send employees to external conferences which has enhanced their environmental knowledge. We also send employees to nature walk in villages such as Kumbalangi and provide opportunities for them to interact with local communities." P11
	The organisation educate employees regarding the negative impact caused to environment	"We educate our employees on adverse effect caused to environment through our tourism activities because conservation of environment has influence in gaining future business." P14
	^a The decisions that organisation initiate have important effect on the natural environment	"If we are reluctant to protect the nature, I think it will cause several environmental problems. Therefore, we take judicious decisions through planning to avoid such events." P10

^a Items that are ignored during q-sort process.

Table 3

Item placement ratio and inter-rate reliability.

Constructs	Theoretical construct classification	Number of dropped items	Actual items in construct	% of Hits	Cohen's Kappa score
Green Knowledge	4	1	3	75.00	0.55
Green Skills	4	1	3	75.00	0.55
Green Abilities	5	1	4	80.00	0.57
Green Attitude	9	2	7	77.78	0.68
Green Behaviour	13	3	10	76.92	0.69
Green Awareness	5	1	4	80.00	0.63
Total	40	9	31		

operators is low, the list has been extended by including the members of the Indian Association of Tour Operators (IATO). Cross-sectional data were collected from the tour operators through face-to-face surveys. A total of 350 survey questionnaires were distributed among the sample group and 276 questionnaires were returned, which indicates that the response rate was 78.86%. After eliminating the questionnaires with missing data and outliers, 268 questionnaires were used for further analysis. The demographic details of the study are presented in Table 6. The sample size of 268 was enough for the analysis, which was verified through G*Power 3.1 software (Faul et al., 2009) because the software shows the adequate sample size necessary for attaining statistical significance by recovering false outcomes. The results obtained after data

processing were 0.30 as the effect size and 0.99 as the power (1- β error probability), which reveals that the minimum sample of the study was 55. Hence, the sample size of 266 satisfies the criteria for adequate sample size.

Common method bias is another concern as the responses were collected from a single category of respondents. The methodology adopted in the study, such as selecting items for constructs through qualitative interviews and the Q-sort process, resulted in data triangulation, and this reduced the common method bias to a certain extent. In addition, Harman's one factor test was assessed and the results depicted that the un-rotated analyses were within the threshold limit of 50%, i.e., 29.406% (Podsakoff and Organ, 1986).

Table 4
Results obtained from Exploratory Factor Analysis (EFA) – Pilot Study.

Items	Extracted Factors					
	1	2	3	4	5	6
Green Knowledge 1	-.068	.019	.054	-.083	.018	.797
Green Knowledge 2	.057	-.076	.171	-.041	.096	.767
Green Knowledge 3	.084	.004	-.001	-.012	-.018	.856
Green Skills 1	.206	.200	.022	-.005	.808	.020
Green Skills 2	.316	.171	.076	.138	.751	.031
Green Skills 3	.280	.218	-.011	-.036	.743	.079
Green Abilities 1	.073	.127	.862	.026	-.001	.019
Green Abilities 2	.148	.187	.832	.052	.053	.030
Green Abilities 3	.240	.154	.846	.021	.016	.109
Green Abilities 4	.173	.123	.840	.071	.032	.118
Green Attitude 1	.709	.162	.094	.081	.139	-.049
Green Attitude 2	.701	.139	.210	.041	.164	-.038
Green Attitude 3	.599	.196	.106	-.013	.315	-.027
Green Attitude 4	.762	.079	.068	.000	.182	.013
Green Attitude 5	.681	.174	.032	.063	.136	.063
Green Attitude 6	.684	.149	.001	.047	.147	.048
Green Attitude 7	.595	.294	.221	.065	.051	.081
Green Behaviour 1	.456	.525	.164	.044	.004	.022
Green Behaviour 2*	.524	.503	.279	.123	.124	.011
Green Behaviour 3*	.499	.408	.169	-.063	-.201	.021
Green Behaviour 4	.453	.543	.212	.004	.028	.044
Green Behaviour 5	.166	.733	.129	.067	.094	-.038
Green Behaviour 6	.173	.677	.018	.037	.127	-.091
Green Behaviour 7	.064	.722	.106	.018	.132	.027
Green Behaviour 8	.135	.655	.097	.136	.181	-.075
Green Behaviour 9	.352	.677	.065	-.015	-.011	.057
Green Behaviour 10	.134	.690	.092	.176	.225	.038
Green Awareness 1	.065	.106	.060	.786	-.007	-.037
Green Awareness 2	.012	.014	.013	.739	-.026	-.024
Green Awareness 3	.013	.119	.071	.767	.068	-.023
Green Awareness 4	.095	.055	.000	.839	.048	-.057

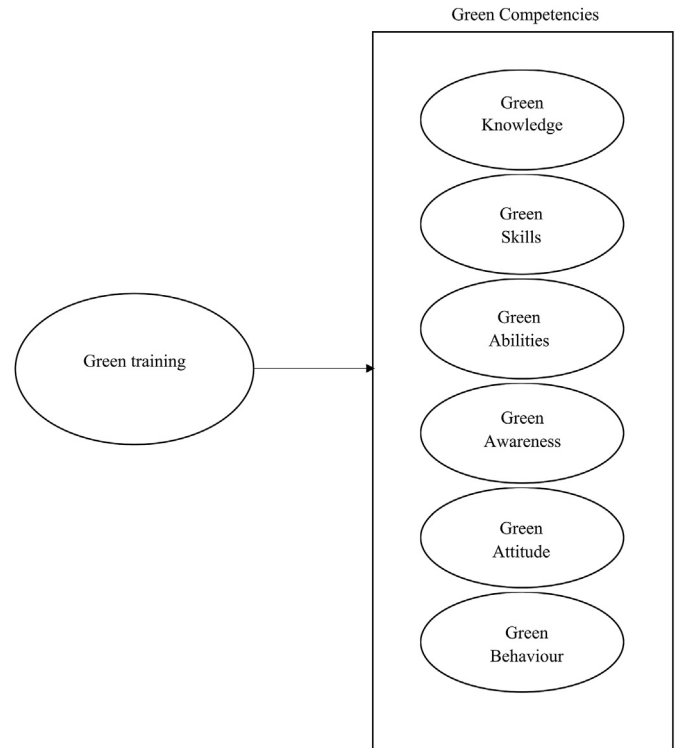


Fig. 2. Conceptual model.

Table 5
Results obtained from Exploratory Factor Analysis (EFA) after dropping items –Pilot Study.

Items	Loadings	Eigen value	Cumulative variation	Cronbach's α
Green Knowledge 1	.653	8.021	27.659	.749
Green Knowledge 2	.635			
Green Knowledge 3	.739			
Green Skills 1	.761	2.713	37.014	.820
Green Skills 2	.730			
Green Skills 3	.716			
Green Abilities 1	.767	2.527	45.727	.902
Green Abilities 2	.758			
Green Abilities 3	.812			
Green Abilities 4	.770	1.925	52.367	.862
Green Attitude 1	.597			
Green Attitude 2	.608			
Green Attitude 3	.522	1.715	58.281	.868
Green Attitude 4	.639			
Green Attitude 5	.525			
Green Attitude 6	.516	1.317	62.821	.799
Green Attitude 7	.508			
Green Behaviour 1	.510			
Green Behaviour 4	.513	1.317	62.821	.799
Green Behaviour 5	.609			
Green Behaviour 6	.526			
Green Behaviour 7	.562	1.317	62.821	.799
Green Behaviour 8	.519			
Green Behaviour 9	.611			
Green Behaviour 10	.585	1.317	62.821	.799
Green Awareness 1	.638			
Green Awareness 2	.548			
Green Awareness 3	.616	1.317	62.821	.799
Green Awareness 4	.725			

Table 6
Demographic profile of respondents -Survey.

Employees'Details (n = 266)	Frequency(s)	Percentage (%)
<i>Gender</i>	192	72.18%
Male		
Female	74	27.82%
<i>Marital Status</i>		
Single	76	28.57%
Married	190	71.43%
<i>Age (in yrs)</i>		
21–30	84	31.58%
31–40	68	25.56%
41–50	91	34.21%
51–60	15	5.64%
61 & above	8	3.01%
<i>Education</i>		
Senior School	22	8.27%
Graduation	125	46.99%
Post Graduation	119	44.74%
<i>Work Experience</i>		
1–9 years	104	39.10%
10–19 years	65	24.44%
20–29 years	89	33.46%
30 years & above	8	3.01%

3.2.4. Outer model (measurement model)

The statistical calculation in this study was computed using SmartPLS 3 software. The study prefers PLS-SEM over CB-SEM for two reasons. First, the technique is flexible as it is not limited to data assumptions and it is used for theory building because of its high statistical power (Hair et al., 2011). The theoretical model developed in this study is novel and adds to theory building. Second, the study uses a complex model and is considered a promising tool for analysing the complex and hierarchical model. The hypothesised model constitutes two constructs, viz., green training and green competencies. To measure green training, 10-item scale by Jabbour (2015) was adopted.

The factor loadings were checked to see whether they exceed 0.70. It was observed that the loadings ranged from 0.704 to 0.902 and thereby satisfied the condition (Table 7). Additionally, the t -value exceeds ± 1.96 at the 5% significance level.

The issue of multi-collinearity was assessed through Variance Inflation Factors (VIF). The values of VIF ranged from 1.485 to 2.487, which indicated that multi-collinearity is within the acceptable limit of < 3.3 (Roldán and Sánchez-Franco, 2012) (Table 7).

The values of Cronbach's α for each construct were: green training (0.912), green knowledge (0.862), green skills (0.831), green abilities (0.879), green attitude (0.885), green behaviour (0.883), and green awareness (0.783). These values are greater than the rule of thumb, i.e., 0.70 (Bagozzi and Yi, 1988) and therefore are acceptable. The composite reliability of the constructs is also greater than 0.70 and the values range from 0.860 to 0.920, which indicates the existence of internal consistency and reliability among the constructs (Table 8).

Convergent and discriminant validity were examined for the constructs. The convergent validity was examined by using the Average Variance Extracted (AVE) and it is greater than 0.50, which indicates the presence of convergent validity. The values in the study range from 0.543 to 0.784 (Bagozzi and Yi, 1988) as shown in Table 8.

Besides Fornell and Larcker's (1981) AVE, the Heterotrait-Monotrait (HTMT) ratio correlation is also used to measure discriminant validity. The value of AVE was found to be < 0.85 (Henseler et al., 2015), which demonstrated discriminant validity and is shown in Table 9.

3.2.5. Inner model (structural model)

This study adopted the steps posited by Hair et al. (2016). First, the path coefficients among the constructs were evaluated and are tabulated in Table 10. It was found that green training has a positive relationship with green competencies ($\beta = 0.694$, $p < 0.001$), which highlights that Hypothesis 1 is supported. The values of the t -statistics exceeded ± 1.96 at the 5% level of significance and thus indicated acceptance of the hypothesis. Second, the variance of the constructs were measured using R^2 (the coefficient of determination) and the variance of green training to dimensions of green competencies record, such as green abilities (0.273), green knowledge (0.256), green awareness (0.219), and green skills (0.163), which indicates a moderate relationship, whereas green attitude (0.373) depicts large variance (Hair et al., 2011).

Third, f^2 (effect size) was examined to understand the variance of the independent variable on the dependent variable. Hair et al. (2016) proposed that the variance is weak if the value is 0.02, it is moderate if the value is 0.15, and it is large if the value is 0.35. The results indicate that green attitude (0.594) and green abilities (0.375) have a large variance. The dimensions, such as green awareness (0.280), green skills (0.195), and green knowledge (0.344), depict that the variance is moderate.

Finally, the existence of predictive relevance between the independent and dependent variable is measured using blindfolding (Stone-Geisser's Q^2). The results indicate that Q^2 is > 0 (Chin, 2010), i.e., green knowledge (0.114), green skills (0.108), green abilities (0.159), green attitude (0.141), green behaviour (0.031) and green awareness (0.120) showcase the presence of higher predictive relevance in the model.

4. Discussion and implications

4.1. Theoretical implications

This study elaborates the GHRM literature by formulating and validating a green competencies model, i.e., a higher-order model, which consists of different dimensions: green knowledge, green skills, green abilities, green awareness, green attitude, and green behaviour. To emphasise, this study adds to the GHRM literature from numerous perspectives. First, this study developed and defined the concept, i.e., green competencies and its measurement validation.

This study presents a model that evaluates and integrates the concept of green training and green competencies. However, there are few studies that identify the relationship between green training and environmental performance (Daily and Huang, 2001) or environmental management maturity (Jabbour, 2015). This is the first study that establishes the empirical relationship between green training and green competencies. This study employed the Natural-Resource-Based-View to arrive at the solution. In fact, the theory proves that firm's resources (i.e., green training provided to human resources) and capabilities (i.e., green competencies, which have attributes, viz., value, rare, inimitable and organisation) may increase the firm's environmental performance and result in a competitive advantage (Barney, 1991; Hart, 1995).

Second, the importance of green training to disseminate green knowledge to employees in the organisation was established. The findings agree with the work of Arulrajah et al. (2015), who posited that green knowledge is a vital element that can be provided through green training and it builds an organisational culture that supports environmental practices in the organisation. Similarly, Daily et al. (2007) indicated that green training provides green knowledge to green teams to utilise existing opportunities, which

Table 7

Standardised factor loading.

	Green Training	Green Knowledge	Green Skills	Green Abilities	Green Attitude	Green Behaviour	Green Awareness	Variance Inflation Factor
Green Training 1	0.781							2.077
Green Training 2	0.739							1.884
Green Training 3	0.748							2.003
Green Training 4	0.734							1.925
Green Training 5	0.719							1.839
Green Training 6	0.769							2.043
Green Training 7	0.753							1.983
Green Training 8	0.730							1.840
Green Training 9	0.773							1.741
Green Training 10	0.716							1.754
Green Knowledge 1		0.902						2.482
Green Knowledge 2		0.868						1.904
Green Knowledge 3		0.885						2.487
Green Skills 1			0.889					2.073
Green Skills 2			0.790					1.673
Green Skills 3			0.908					2.416
Green Abilities 1				0.869				2.263
Green Abilities 2				0.864				2.155
Green Abilities 3				0.875				2.401
Green Abilities 4				0.813				2.027
Green Attitude 1					0.726			1.657
Green Attitude 2					0.765			1.867
Green Attitude 3					0.784			1.944
Green Attitude 4					0.753			1.840
Green Attitude 5					0.720			1.614
Green Attitude 6					0.816			2.148
Green Attitude 7					0.821			2.240
Green Behaviour 1						0.712		1.860
Green Behaviour 4						0.740		1.961
Green Behaviour 5						0.716		1.849
Green Behaviour 6						0.803		2.031
Green Behaviour 7						0.704		1.797
Green Behaviour 8						0.750		1.907
Green Behaviour 9						0.744		1.638
Green Behaviour 10						0.723		1.614
Green Awareness 1							0.777	1.485
Green Awareness 2							0.794	1.622
Green Awareness 3							0.788	1.502
Green Awareness 4							0.751	1.594

Table 8

Reliability and validity (Fornell-Larcker) measures.

Construct	Cronbach's α	rho_A	Convergent Reliability	Average Variance Extracted	Green Abilities	Green Behaviour	Green Attitude	Green Knowledge	Green Skills	Green Training	Green Awareness
Green Abilities	0.879	0.891	0.916	0.732	0.856						
Green Behaviour	0.883	0.910	0.905	0.543	0.279	0.737					
Green Attitude	0.885	0.888	0.911	0.594	0.590	0.354	0.770				
Green Knowledge	0.862	0.868	0.916	0.784	0.377	0.168	0.456	0.885			
Green Skills	0.831	0.859	0.898	0.746	0.284	0.096	0.316	0.561	0.864		
Green Training	0.912	0.912	0.926	0.557	0.522	0.31	0.611	0.506	0.404	0.747	
Green Awareness	0.783	0.789	0.859	0.605	0.371	0.15	0.536	0.215	0.198	0.468	0.778

Table 9

Discriminant Validity: Heterotrait-Monotrait criteria.

	Green Abilities	Green Behaviour	Green Attitude	Green Knowledge	Green Skills	Green Training	Green Awareness
Green Abilities	1.000						
Green Behaviour	0.287	1.000					
Green Attitude	0.672	0.367	1.000				
Green Knowledge	0.428	0.172	0.521	1.000			
Green Skills	0.323	0.108	0.365	0.662	1.000		
Green Training	0.574	0.308	0.676	0.566	0.456	1.000	
Green Awareness	0.438	0.167	0.639	0.259	0.245	0.545	1.000

Table 10
Hypothesis Testing: Path coefficient.

Hypothesis	Relationship	Path Coefficient	t-value	Results
H1	Green Training → Green Competencies	0.694	12.534	Supported
	Green Training → Green Knowledge	0.506	6.153	Supported
	Green Training → Green Skills	0.404	6.367	Supported
	Green Training → Green Abilities	0.522	7.622	Supported
	Green Training → Green Attitude	0.611	7.019	Supported
	Green Training → Green Behaviour	0.310	4.244	Supported
	Green Training → Green Awareness	0.468	5.621	Supported

helps them face several challenges posed by the external environment. Green knowledge is not just confined to environmental aspects, but extended to social aspects that are related to ecotourism principles. The principle includes conservation of biodiversity and respect for cultural heritage, contributions to the welfare and empowerment of the local communities, and assistance in the democratic process and human rights (Cobbinah, 2015).

Third, this study asserted the impact of green training on enhancing green skills. Renwick et al. (2013) stated that the role of providing green training in the workspace is to nurture green skills regarding energy efficiency, waste management, and environmental analysis among employees. Dlimbetova et al. (2016) further asserted the lack of understanding and the need for developing green skills in the workspace. Hence, a deficiency of green skills can be rectified through green training by incorporating environmental aspects in the curriculum. Such acts can enable employees to engage in practices that diminish the adverse impacts caused by an organisation on the natural environment.

Fourth, the relationship of green training with green abilities was also confirmed. The findings agree with the work of Arulrajah et al. (2015), wherein the researchers described the effect of green training on employees to create green abilities in the organisation, which results in enhancing overall environmental performance. Green training ensures that the employees apply green knowledge and skills in practical situations and enables the business organisation to achieve its environmental goals. Similarly, training assists in enhancing employees' green abilities, which benefit the organisation in mitigating waste and improving productivity, profitability, and the quality of the service/product (Renwick et al., 2013).

Fifth, the relationship between green training and green awareness was established in this study, which is consistent with the assertion of Opatha and Arulrajah (2014). The researchers proved that green awareness is an important constituent that is fostered through green training. The study of Mishra (2017) (in the Indian context) provided a case of a public organisation where green training sessions were conducted on environmental awareness, and these sessions aided the employees in becoming aware of the environmental degradation and caused them to undertake measures for avoiding these environmental issues. Green awareness can be regarded as the dimension that initiates and commences green competencies in employees. For instance, the awareness imbibed in employees through green training enlightens the perception, consciousness and feelings about environmental conservation and assists the employees to learn the facts and concepts about the environment and ecosystems and thus indoctrinates green knowledge.

Sixth, training on environmental aspects influences the two core components of employees' attitudes, i.e., their belief system and thought process along with their emotions. The information accessed through green training sessions influences the employees to maintain positive emotions and to participate in activities that conserve natural resources. This agrees with the findings of Tisdell and Wilson (2005) who stated that providing education in

environmental studies alters the attitude of tourists and drives them to take part in conservation activities. Similarly, providing green training sessions within the organisation forges green attitude, which encourages a positive approach among employees to endeavour in pollution reduction, product stewardship, and sustainable development.

Seventh, green training acts as a systematic process that enables green behaviour in an employee, which in turn aids an organisation in achieving their environmental objectives. The findings reaffirm with Mishra (2017) who asserted that providing environmental training or learning to employees helps them to imbibe in green behaviour. Utilising green behaviour is a sub-dimension in green competencies that can be directly observed by people and can be stated as an outcome of green competencies in employees. Employees with green behaviour detract themselves from unsustainable activities that degrade the natural environment. Moreover, these employees display a positive attitude towards the education of various environmental concepts and transferring them to colleagues and clients.

4.2. Managerial implications

The findings of this study are significant for managers and employees in not only the tourism and hospitality industry, but also when extended to other economic sectors. The findings emphasise the existing understanding of green competencies, which need to be developed among employees. Specifically, the findings advocate that managers must nurture an ecosystem of creating green competencies in the organisation by providing adequate green training on a regular basis.

The results prove that green training is essential to inculcate green competencies among the employees in an organisation. To achieve a positive environmental performance, an organisation needs to consistently diffuse green competencies among their employees. Managers can use the scale developed in this study to assess the improvement of green competencies among employees through green training. The scale can also be used to assess the green competencies of candidates during the selection process or to evaluate the existing level of green competencies among employees. If the employees lack green competencies, this can be rectified through adequate green training (Perron et al., 2006). In fact, the scale provides insights for managers to have a basic understanding of the elements that constitute green competencies and possible ways of nurturing those elements within the organisation. Most importantly, this study elaborates on the importance of behavioural factors, such as green behaviour and green attitude, which indicates that a meagre supply of knowledge or skill is insufficient to achieve the desired environmental outcomes. The findings also discuss the idea of nurturing green abilities among employees because these abilities make the employees utilise their existing green knowledge and green skills to solve imminent environmental problems in the organisation. More precisely, the conceptual model could be helpful to managers for considering

behavioural aspects such as green competencies for overcoming environmental degradation and for facilitating sustainability in the organisation.

5. Conclusion

The present study aims to develop a valid and reliable scale for encapsulating green competencies in organisations. There are a few previous studies that conceptualised green competencies and the first study that conducted construct development and measurement validation of the green competencies scale. The outcome obtained from the analysis reveals that green competencies are a parsimonious item construct included under the six dimensions, which are reflective in nature. The measurement instrument has a high level of reliability and validity, which can be used to measure green competencies in a business organisation. This study provides new insights in theory and practice related to an essential GHRM requirement in the organisation, i.e., green competencies. The study also formulates an effective model that integrates the construct of green training and its direct impact on green competencies, which agrees with the theory of the Natural-Resource-Based-View. Therefore, the study provides insights into the existing state-of-the-art in GHRM in the literature.

The present study has a few limitations. First, cross-sectional data was used in the study to ascertain the causal relationship. Future studies could employ longitudinal data to understand the effect of the constructs at multiple time points. Second, the present green competencies scale was constructed on the basis of the experience of Indian employees in the tourism and hospitality industry; hence, the scale is subjected to national cultural bias. The replication of this scale in other national contexts would help to understand its generalised use.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jclepro.2019.07.014>.

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