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Unlocking employee's green behavior in fertilizer industry: the role of green HRM practices and psychological ownership

RESEARCH ARTICLE

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Abstract

The engineering of agrochemicals and inorganic fertilizers indirectly facilitates the emissions of NO₂ and CO₂. The extensive use of pesticides and inorganic chemical fertilizers has drawn the world's attention to green practices. Grounded on the ability-motivation-opportunity (AMO) theory, we investigated the effect of green human resource management (GHRM) practices on employees' green behavior with the mediating role of psychological ownership. We applied the partial least square structural equation modeling (PLS-SEM) technique to 279 responses acquired from the fertilizer manufacturing firm employees. The results show that GHRM practices (green competence building, green motivation enhancing, and green employee involvement practices) significantly improve employee green behavior. Additionally, GHRM practices enhance the sense of ownership of nature among employees due to which they involve themselves proactively in eco-friendly activities and behavior.

Keywords: employee green behavior, green HRM, psychological ownership, ability-motivation-opportunity theory, PLS-SEM

JEL code: N55, O15, Q13, Q15

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1. Introduction

Realizing the protection of the planet for future generations, intergovernmental organizations are continuously developing policies to align 'green' with 'development' (Thore and Tarverdyan, 2016). Since agriculture is the backbone of many developing countries (Newman *et al.*, 2020), this holds particularly for rebuilding natural capital by reducing agricultural greenhouse gas (GHG) emissions, biodiversity loss, decreasing deforestation, inorganic agrochemical pollution, and maintain soil fertility (Struik and Kuyper, 2017). Like other developing countries, Pakistan is also heavily dependent on the agriculture sector. Around 20% of the gross domestic product is contributed by the livestock and agriculture sector while 42% of the labor force is employed by the agricultural sector of Pakistan (Rehman *et al.*, 2017). Nonetheless, environmental quality is largely compromised as the agriculture sector contributes a 40% share of GHG emissions primarily from the burning of crop residues, manure management, enteric fermentation, rice cultivation, soil management, and livestock which demands urgent consideration (Ullah *et al.*, 2018).

Nitrogen (N) and carbon dioxide (CO₂) are generally taken by crops from the soil and atmosphere which they reallocate to residues, soil organic matter, and living biomass. In cycle due to the combustion process, soil organic matter, biomass decomposition, and the respiration of the plants, toxic gases such as NO₂, methane (CH₄), and CO₂ are released to the atmosphere. Additionally, engineering of required inputs like agrochemicals and inorganic fertilizers also indirectly facilitate the emissions of NO₂ and CO₂ (Tripathi and Mishra, 2017). Thus, researchers believe that ecological catastrophes can be avoided by discouraging the use of pesticides and inorganic chemical fertilizers (Xu *et al.*, 2015; Zhang *et al.*, 2015). Nitrogen-rich fertilizers may form solid particles in the air with combustion emissions (Bauer *et al.*, 2016). Although the use of fertilizers facilitates output growth, low-quality fertilizers are not safe for human consumption and have detrimental effects on soil fertility (Rahman and Zhang, 2018). Especially in the context of Pakistan, farmers have protested the shortage of several micronutrients in fertilizers that directly influence their crop production and soil fertility. Farmers' outrage encouraged Soil and Water Testing Laboratory for Research to test the samples of fertilizers. Ten out of eleven samples were found substandard (Dawn, 2020). This prominent issue motivates us to investigate if the greenness of the fertilizer industry can be improved by linking green human resource management (GHRM) practices to employee green behavior. The key elements of GHRM enhance a firm's sustainability by providing green opportunities, motivating pro-environmental behavior, and developing green ability in their employees (Renwick *et al.*, 2013).

The contribution of an employee in environmental matters can be explained through the life cycle assessment (LCA) methodology that unravels the connection of environmental impacts with the entire production system (Russell *et al.*, 2005). Since the employees are principal stakeholders of the production processes, they have assessable and more distinguishable social impact compared to other stakeholders (Mattioda *et al.*, 2017). Their behavior is bound to affect the effective enactment of the firm's eco-friendly policies. In order to execute related practices efficiently, promoting environmental awareness in individual employees is crucial (Owino and Kwasira, 2016). The green HRM, defined as the set of systems, policies, and practices to develop a socially responsible, resource-efficient, and environmentally sensitive workplace is an efficient tool to encourage green employees' behavior. The green HRM practices (green competence building, green employee involvement, and green motivation enhancing practices) foster eco-friendly initiatives that result in sustainable development through the reduction of carbon footprint, better farming practices, and proper waste disposal (Jackson *et al.*, 2011). Such green practices also play a vital role in managing brand equity and sustainable growth (Bombiak and Marciniuk-Kluska, 2018; Moise *et al.*, 2019). However, the ultimate model to drive environmental performance cannot be developed without aligning the organizational green goals with employee behavior (Saeed *et al.*, 2019). These concerns have highlighted the importance of the adoption of green HRM practices for better eco-friendly production processes. Accordingly, this study explains how GHRM practices lead to employees' green behavior by analyzing the mediating effect of psychological ownership (PO). Generally, researchers have associated psychological ownership with positive behavioral and attitudinal outcomes such as employee commitment, retention, job satisfaction, organizational citizenship behavior, and knowledge sharing (Degbey *et al.*, in press; Pittino *et al.*, 2018; Wang *et al.*, 2019). Similarly,

Matilainen *et al.* (2017) noted that ownership feelings may promote optimal use of natural resources under both cooperative and conflicting stakeholders' opinions. Here, we posit that GHRM practices build employees' green competency which boosts their feeling of possession over environmental concerns and motivates them to bring eco-friendly solutions.

Several key limitations in the existing literature led us to the design and rationale of this study. Based on the data collected from 279 employees associated with the fertilizer industry, this study extends the limited but rapidly growing body of research on employees' green behavior in several ways. First, prior studies have empirically investigated the effect of GHRM practices on employees' behavior in various sectors such as manufacturing small and medium enterprises (Singh *et al.*, 2020), automobile industry (Yu *et al.*, 2020), hospitality and tourism industry (Pham *et al.*, 2019) but largely ignored the fertilizer sector. However, this study provides a better understanding of GHRM practices and employees' green behavior in the Agri industry in the context of a developing country like Pakistan. Since the field of GHRM is still in its infancy, consequently, this study directly answers the call (Dumont *et al.*, 2017; Shafaei *et al.*, 2020) for more extensive empirical evidence. Second, this study empirically tests GHRM practices separately derived from the ability-motivation-opportunity (AMO) framework which are so far tested by Anwar *et al.* (2020) on environmental performance through organizational citizenship behavior (OCB) in academics. Third, scant GHRM literature has considered individual-level employee engagement or behavior. However, employees may show less reluctance toward adopting eco-friendly behavioral facets when green policies or practices are adequately implemented (Unsworth *et al.*, 2013). Thus, ignoring the behavioral aspects of employees may not provide a parsimonious model to proficiently improve a firm's sustainability. Studies suggest that HRM policies may influence employee behavior and outcomes through different aspects of psychological processes and called for incorporating certain mechanisms in the framework (Dumont *et al.*, 2017; Renwick *et al.*, 2013). Thus, introducing the mediating role of employee psychological ownership between green HRM and employee green behavior fills a major gap in the literature.

2. Literature review and hypotheses development

2.1 Green competence building practices and psychological ownership

The AMO theory substantially explains the role of GHRM and how the employee's ability, motivation, and opportunity contribute to organizational performance (Appelbaum *et al.*, 2000; Renwick *et al.*, 2013). The theory states that having relevant knowledge and skills by employees, continuous employer motivation, and provision of opportunities to the employees for participation in organizations' decision-making processes are conducive to smooth organizational operations. Thus, in order to achieve environmental sustainability, organizations should design efficient green HRM practices based on the AMO framework to align employees' behavior and attitudes with organizational green objectives (Dumont *et al.*, 2017; Jia *et al.*, 2018; Pham *et al.*, 2019). Grounded on AMO perspective, Appelbaum *et al.* (2000) stated that the HRM practices that promote abilities, motivation, and opportunities of their employees and lead the organization to capture the mental and psychosomatic possession of its employees which further improves not only the performance of employees but also the performance of the organization. Organizations that demonstrate the wide application of GHRM practices get more benefits from their employees' productivity and efficiency (Salem *et al.*, 2012).

In the light of the AMO model, several researchers have discussed the concept of Green HRM (GHRM) in multiple areas (Pham *et al.*, 2019; Singh *et al.*, 2020; Yu *et al.*, 2020). For instance, Pham *et al.* (2019) noted that green education, green employee participation, and green functioning administration lead to organizational residency and employees' organizational citizenship behavior in the hospitality industry. Based on 126 automobile manufacturers in China, Yu *et al.* (2020) revealed that GHRM is positively related to environmental collaboration with clients and vendors while green supply chain management strengthens this association. Similarly, Singh *et al.* (2020) examined how green HRM practices interlink among green transformational leadership, green modernization, and ecological presentation in small and medium enterprises. Based on AMO theory and seminal work of Renwick *et al.* (2013), three major activities of GHRM are

evaluated, i.e. green competence building practices (GCBP), green motivation enhancing practices (GMEP), and green employee involvement practices (GEIP).

The green competence building practices (GCBP) refer to green recruitment, selection, training, and development (T&D) that improve employees' pro-environmental behavior through the green familiarity, recognition, branding, and criterion (Tang *et al.*, 2018; Teixeira *et al.*, 2012; Vidal-Salazar *et al.*, 2012). The GCBP facilitates the environmental agenda of the organization by upskilling the employees in executing green working practices, instilling green values, and enhancing employees' environmental consciousness. The employers also give preference to those applicants who possess more diversified and compatible knowledge or skills to proactively deal with environmental issues within the organization (Tang *et al.*, 2018). Developing green competencies of employees improve their sense of purpose and meaningfulness of work that makes them more psychologically available to tackle the environmental problems of the organizations. In line with these arguments, Pinzone *et al.* (2016) found the positive relationship of GCBP with collective organizational citizenship behaviors toward the environment. Similarly, Dumont *et al.* (2017) argued that green T&D improves job-related and discretionary green behavior of employees.

Although studies have directly linked GHRM practices with employee's pro-environmental behavior (Harvey *et al.*, 2013; Paillé *et al.*, 2014), we believe that green T&D or recruitment policies may enhance employee's psychological ownership, involves both shared beliefs and norms of behavior that are in line with the organization's best interest. Employees may take green initiatives when their targets are compactly associated with the self and extended self through the feeling of possession. Based on the AMO framework, Lu *et al.* (2017) found a positive effect of certain HRM practices on psychological ownership in Chinese small and medium-sized enterprises. Competence building of employees may help employees to intimately know their organizations. Based on their knowledge and skills, they share information frequently which enables them to familiarize, associate, and understand the organizational goals intimately (Huselid, 1995). This argument is also supported by other management theories (e.g. expectancy theory) that when employees will be recruited and trained on the green agenda, they will feel more proud once an organization's environmental goal is successfully fulfilled (Kim and Beehr, 2017). Accordingly, the following hypothesis is developed:

H1: Green competence building practices is positively related to psychological ownership.

2.2 Green motivation enhancing practices and psychological ownership

The green motivation practices emphasize the need for performance assessment and reward system. These practices align the employees' behavior towards the accomplishment of the organization's mission and goals (Harvey *et al.*, 2013). In the case of firms' environment management, it must ensure that its employees clearly understand the environment of the organization. By providing regular feedback regarding environmental performance, the skills, professional approach, efficiency, and productivity of employees in environmental management can be improved (Jackson *et al.*, 2011). Daily and Huang (2001) documented that rewards based on environmental performance improves employees' commitment and make them more environmentally responsible.

A previous study by Milkovich and Wigdor (1991) argued that performance-contingent rewards motivate employees to invest the self into organizational goals. Appraising performance and rewarding employees on the basis of their connection with environmental performance, incentives for recycling, proposing solutions to mitigate emissions, using pollution-free conveyance may act as positive reinforcement (Jackson *et al.*, 2011). This reward and assessment system may create a win-win situation and individuals may experience a cognitive-affective state (i.e. psychological ownership, where they own the responsibilities for achieving success (Degbey *et al.*, in press). In light of the aforementioned arguments, we have built the following hypothesis:

H2: Green motivation enhancing practices is positively related to psychological ownership.

2.3 Green employee involvement practices and psychological ownership

Organizations with green practices provide equal opportunities to their employees in the decision-making process (DuBois and Dubois, 2012) which makes them feel empowered. Employee empowerment leads to self-control and improves their problem-solving skills (Renwick *et al.*, 2013). When the employees are involved in decision-making, it leads to an establishment of pro-environmental culture in the firms and supports the free exchange of knowledge and ideas at the desired levels (Alt and Spitzbeck, 2016). Firms that encourage their employees to become a part of the decision-making process, help them to develop a positive attitude of psychological ownership (Liu *et al.*, 2012). The enriched autonomy related to self-managing work teams stimulates the feeling of possession (Pierce *et al.*, 2003). Employees who can control the work are more likely to be aroused to work in the best interests of the organization (Lu *et al.*, 2017). The theory of psychological ownership strongly supports the notion that empowering employees may make them more responsible, protective, and attached to the organizational goals (Van Dyne and Pierce, 2004). Thus, we believe that GEIP enhances psychological ownership by empowering and engaging the workforce to recommend green policies and execute them confidently (Haddock-Millar *et al.*, 2016). Accordingly, the subsequent hypothesis is recommended:

H3: Green employee involvement practices is positively related to psychological ownership.

2.4 Psychological ownership and employee green behavior

Psychological ownership plays a vital role in developing certain attitudes and behaviors of the employees, thus, the environment of organizations is highly founded on psychological rather than legal or real ownership (Jackson *et al.*, 2011; Pierce *et al.*, 2003). For instance, employees may have developed a sense of ownership for their working organizations despite the absence of any equity in it (Van Dyne and Pierce, 2004). In the organizational settings, an increased level of psychological ownership leads to higher commitment and loyalty (Han *et al.*, 2010) and employees' stewardship behavior (Avey *et al.*, 2009). The sense of ownership also positively influences employees' efforts towards achieving the organizational objectives and develop their pro-environmental attitudes (Jussila *et al.*, 2015; Kamleitner and Rabinovich, 2010). Furthermore, psychological ownership makes them (employees) understand their roles and responsibilities within the organization. It also leads to their citizenship behavior (Anwar *et al.*, 2020; Poutsma *et al.*, 2015), and extra-role behavior (Mustafa *et al.*, 2015), including employee green behavior (Dumont *et al.*, 2017). Süssenbach and Kamleitner (2018) argued that psychological ownership is an effective tool that may stimulate pro-environmental behavior and combat systematic obstacles to sustainable development. Although the empirical link between PO and employee green behavior (EGB) is developed in previous literature, it is still underexplored especially in the context of the fertilizer industry's employees. Based on the above-mentioned argument, the following hypothesis is expressed:

H4: Psychological ownership is positively related to employee green behavior.

2.5 The intervening role of psychological ownership

The developmental HRM literature identifies that HR practices may not directly have an emotional impact on employee behavior; rather, effects are transferred through various underlying mechanisms (Jiang *et al.*, 2012). In this study, it is proposed that psychological ownership is a psychological process through which green HRM practices influence EGB. The AMO-based GHRM practices develop meaningfulness of work along with the sense of familiarity and knowledge of the organization which in turn develop psychological ownership. Likewise, more control over their work through GHRM boosts employee's work autonomy and self-efficacy (Pierce *et al.*, 2003). When employees feel psychological ownership, they consider the organizational identity as their extended self and thereby, thrive to achieve the organization's environmental and sustainable goals (Jiang and Li, 2019). Through accountability, self-identity, belongingness, and self-efficacy, PO involves employees to take more initiative in citizenship behavior toward the environment (Wang *et al.*, 2019).

Prior studies have utilized PO as an alignment mechanism between positive leadership and employees' extra-role behaviors (Kim and Beehr, 2017), transformational leadership and employee engagement (Ghafoor *et al.*, 2011), ethical leadership and job satisfaction (Avey *et al.*, 2012), material values and pro-environmental behaviors (Felix and Almaguer, 2019) and between empowered leadership and OCB toward the environment (Jiang and Li, 2019). Grounded on psychological ownership and AMO theory, we hypothesized that green HRM practices trigger green behavior of employees by enhancing their psychological ownership toward the environment and eco-friendly organizational policies:

H5: Psychological ownership mediates the relationship between green competence building practices and employee green behavior.

H6: Psychological ownership mediates the relationship between green motivation enhancing practices and employee green behavior.

H7: Psychological ownership mediates the relationship between green employee involvement practices and employee green behavior.

3. Methods

3.1 Data collection and sampling

The respondents of the study were associated with the fertilizer sector of Pakistan and only those fertilizer manufacturing companies were taken as samples that were ISO 14000 certified.¹ Discussion with higher management revealed that these companies were engaged in environmental management and green HR practices. Before the distribution of the questionnaires, approval was taken from the respective higher management. The objective of the study and the confidentiality of the responses were explained to the respondents. Survey questionnaires were distributed during the working hours. Respondents were allowed to fill the questionnaire voluntarily and can return it without filling it. Questionnaires were returned during the working hours in the presence of their supervisors and managers.

Keeping in mind the time and budget constraints, the data were collected through the convenience sampling technique.² For estimating appropriate sample size, we have utilized G*Power software (Heinrich-Heine-Universität, Düsseldorf, Germany) ('*a priori*' power analysis) suggested by Hair *et al.* (2017). This analysis recommended a minimum sample size of 138 for a statistical power of 80% in terms of 0.15 effect size and four predictors. However, we distributed 400 questionnaires for this study. The targeted employees were working in four different companies situated in different provinces of Pakistan. Therefore, we believe that a sample of 400 respondents is adequate for the study. The questionnaires were returned by 296 respondents but 279 were retained after discarding missing and improper responses. The response rate for this study was 69.5%. Around 73.4% of the respondents were male and 26.6% were female, the highest percentage (i.e. 54.2%) of the respondents were within the age bracket of 31 to 35 years, most of the respondents (i.e. 66.8%) had at least master's degree, 48% of the respondents were highly experienced (served between 5 to 10 years in the fertilizer industry) and 23% of the individuals are employed in the same organization from last 10 years.

¹ Although there are six ISO 14000 certified fertilizer firms in Pakistan, we were able to collect data from four companies, i.e. Fauji Fertilizer, Engro Fertilizer Company, Dawood Hercules, and Fatima Fertilizers

² Although convenience sampling is criticized by the researcher due to its inability to produce representative results, we used this technique due to limited population of the study. There are only six fertilizer companies in Pakistan with ISO 14000 certification from which two companies did not respond positively toward the survey. For rest of the firms, we were able to collect the data from the employees referred by the management. Nonetheless, we have tried to reduce several statistical biases (e.g. CMV or measurement error) to produce representative estimates.

3.2 Measures

Measures used in this study were adopted from the existing literature. All the responses were recorded on a five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. The theoretical framework contained three exogenous constructs, two of them were green competence building practices (GCBP) and green motivation enhancing practices (GMEP) which were reflective-reflective. GCBP was a higher-order construct (HOC) whereas green recruitment and selection (GRS) and green training (GT) was its lower-order constructs (LOCs). Similarly, GMEP was HOC whereas green performance and management (GPM) and green pay and reward (GPR) were LOCs. Green employee involvement practices (GEIP) were a third and lower order construct. These three constructs were measured by using a 19-items scale by Tang *et al.* (2018). The reliability coefficient of all their constructs was above 0.7. A sample question includes 'we develop training programs in environmental management to increase environmental awareness, skills, and expertise of employees'. We found Cronbach alpha and composite reliability of all the constructs above 0.80 ensuring the scale's reliability.

Psychological ownership was measured by using five items scale by Pierce *et al.* (1991). An example of an item was 'I am comfortable being in this organization'. Cronbach's alpha value was 0.870, and composite reliability of 0.918. Employee green behavior was measured by using five items from Pierce *et al.* (1991). A sample item was 'At work, I take part in environmentally friendly programs'. Cronbach's alpha value was 0.73.

3.3 Common method variance bias

Common method variance (CMV) was addressed using Harman single factor analysis (Harman, 1967) because data were collected from a single source (Podsakoff *et al.*, 2003). Exploratory factor analysis showed the first factor explained 30.494 variances suggesting CMV was not an issue (Babin *et al.*, 2016).

3.4 Statistical analysis

Recent studies relevant to green HRM have used Smart PLS (Anwar *et al.*, 2020; Fernando *et al.*, 2019; Pham *et al.*, 2019). The partial least square structural equation modeling (PLS-SEM) approach using Smart PLS 3.2.8 (SmartPLS GmbH, Bönningstedt, Germany) was utilized for data analysis. The PLS-SEM can deal with complex mediation models (Hair *et al.*, 2019), and it does not assume strict normality (Chin *et al.*, 2003). Following the guidelines provided by previous studies (Ramayah *et al.*, 2018), in the first stage, the measurement model of the LOCs was reported. Latent Variable Scores were saved and copied to the original data file. These latent variables served as indicators of the HOCs (GCBP and GMEP). In the second stage, the measurement model of the HOCs and structural model were reported.

■ Measurement model

The measurement model was evaluated by outer loadings, average variance extracted (AVE), composite reliability (CR), heterotrait-monotrait (HTMT) criterion. These tests were used to assess convergent validity (CV), internal consistency reliability, and discriminant validity (DV) respectively. Factor loadings and AVE should be equal to or greater than 0.50. CR should be equal to or greater than 0.70 and HTMT value should not exceed 0.90 (Franke and Sarstedt, 2019). It can be seen from Table 1 that all AVE values were above 0.50, CR was greater than 0.70 for all constructs, outer loadings were above 0.50. However, GPR1 was removed in the first stage to bring the results in the acceptable range. HTMT criteria showed that all values were less than 0.90. Therefore, all the criteria requirements of the measurement model for the first stage were fulfilled.

Table 1. Reliability and validity of the first order constructs.¹

Constructs and items	Factor loadings	Composite reliability	Average variance extracted
Green recruitment and selections (GRS)		0.813	0.594
GRS1	0.770		
GRS2	0.863		
GRS3	0.667		
Green training (GT)		0.855	0.664
GT1	0.800		
GT2	0.906		
GT3	0.729		
Green pay and reward (GPR)		0.773	0.632
GPR2	0.869		
GPR3	0.714		
Green performance management (GPM)		0.890	0.669
GPM1	0.807		
GPM2	0.809		
GPM3	0.867		
GPM4	0.786		
Green employee involvement practices (GEIP)		0.837	0.510
GEIP1	0.745		
GEIP2	0.790		
GEIP3	0.594		
GEIP4	0.765		
GEIP5	0.658		
Psychological ownership (PO)		0.895	0.632
PO1	0.850		
PO2	0.797		
PO3	0.824		
PO4	0.684		
PO5	0.808		
Employee green behavior (EGB)		0.838	0.563
EGB1	0.763		
EGB2	0.732		
EGB3	0.788		
EGB4	0.718		

Similarly, the measurement model for second-order constructs was evaluated using the same criteria. It can be noticed from Table 2 that all AVE and CR values were within the acceptable range. EGB1, EGB3, and EGB5 were deleted due to low outer loadings. HTMT correlation value between GMPE and GCBP was very close to 0.90 as shown in Table 3. However, items or LOCs could not be removed from the model because they were considered a necessary part of HOC. Therefore, LOCs with higher correlation values were retained.

Table 2. Reliability and validity of the second-order constructs.

Constructs and items	Factor loadings	Composite reliability	Average variance extracted
Green competence building practices (GCBP)		0.800	0.669
GCBP1	0.892		
GCBP2	0.736		
Green motivation enhancing practices (GMEP)		0.806	0.676
GMEP1	0.881		
GMEP2	0.759		
Green employee involvement practices (GEIP)		0.837	0.510
GEIP1	0.745		
GEIP2	0.791		
GEIP3	0.594		
GEIP4	0.764		
GEIP5	0.658		
Psychological ownership (PO)		0.895	0.632
PO1	0.852		
PO2	0.793		
PO3	0.824		
PO4	0.686		
PO5	0.810		
Employee green behavior (EGB)		0.815	0.690
EGB2	0.733		
EGB4	0.919		

Table 3. Discriminant validity of the second-order constructs.¹

Constructs	EGB	GCBP	GEIP	GMEP	PO
EGB					
GCBP	0.806				
GEIP	0.637	0.855			
GMEP	0.782	0.898	0.782		
PO	0.653	0.816	0.601	0.684	

¹ EGB = employee green behavior; GCBP = green competence building practices; GEIP = green employee involvement practices; GMEP = green motivation enhancing practices; PO = psychological ownership.

■ Structural model

According to guidelines provided by Ramayah *et al.* (2018) and Hair *et al.* (2017), the structural model was assessed, using 5,000 resample for bootstrapping technique. Multi-collinearity was assessed through the variance inflation factor (VIF) values. Diamantopoulos and Siguaw (2006) suggested that the VIF value should be less than 3.3. All values were below 3.3 for all relationships ensuring no issue of multi-collinearity. Predictive relevance (Q^2) was evaluated using the blindfolding procedure (Geisser, 1975). Q^2 value greater than zero indicates the presence of a model's predictive relevance (Sinkovics *et al.*, 2016). Q^2 values of two endogenous constructs (PO and EGB) were 0.237 and 0.147 indicating sufficient predictive relevance of the model. Effect sizes (f^2) were evaluated for all relationships. According to Cohen (1992), 0.02, 0.15, and 0.35 represent small, medium, and large effects respectively. GCBP, GEIP, and GMEP had a medium effect on PO, and PO had a large effect on EGB respectively.

4. Results

The results show that all GHRM practices are positively and significantly associated with PO. Thus, we accept the first three hypothesis that GCBP ($\beta=0.330$, $t=4.832$, $LL=0.195$, $UL=0.460$), GEIP ($\beta=0.223$, $t=3.072$, $LL=0.074$, $UL=0.359$) and GMEP ($\beta=0.184$, $t=2.711$, $LL=0.047$, $UL=0.310$) have a positive effect on PO. The three predictors explained 38.7% of the variance in PO which is satisfactory as per the above 10% criteria of Falk and Miller (1992). The results of the direct effects also show a positive and significant association of PO with EGB ($\beta=0.485$, $t=9.861$, $LL=0.376$, $UL=0.573$), leading to the acceptance of the fourth hypothesis (Table 4). Additionally, R^2 was 0.235 explaining a 23.5% variance in EGB by PO.

We follow the criteria of Preacher and Hayes (2004) for the mediation analysis (indirect effects). A statistically significant indirect effect (two tail) with t -value equal to or greater than 1.96 and P -value equal to or less than 0.05 was considered for mediation to exist (Memon *et al.*, 2018). PO mediated between GCBP and EGB ($\beta=0.160$, $t=3.906$, $LL=0.084$, $UL=0.243$), GEIP and EGB ($\beta=0.108$, $t=2.809$, $LL=0.034$, $UL=0.184$), and between GMEP and EGB ($\beta=0.089$, $t=2.594$, $LL=0.023$, $UL=0.157$). Thus, H5, H6, and H7 were also supported. The details of indirect effects are presented in Table 5. A more comprehensive overview of the results is given in Figure 1.

Table 4. Direct effects.¹

Hypothesis	Relationships	S. Beta	S.D.	t -value	P -value	BCI LL	BCI UL	f^2	VIF
H1	GCBP \rightarrow PO	0.330	0.068	4.832	0.000	0.195	0.460	0.104	1.705
H2	GEIP \rightarrow PO	0.223	0.073	3.072	0.002	0.074	0.359	0.047	1.742
H3	GMEP \rightarrow PO	0.184	0.068	2.711	0.007	0.047	0.310	0.036	1.520
H4	PO \rightarrow EGB	0.485	0.049	9.861	0.000	0.376	0.573	0.307	1.000

¹ BCI = bias confidence interval; f^2 = effect size; LL = lower limit; S. Beta = standardized Beta; S.D. = standard deviation; UL = upper limit; VIF = variance inflation factor.

Table 5. Indirect effects.¹

Hypothesis	Relationships	S. Beta	S.D.	t -value	P -value	BCI LL	BCI UL
H5	GCBP \rightarrow PO \rightarrow EGB	0.160	0.041	3.906	0.000	0.084	0.243
H6	GEIP \rightarrow PO \rightarrow EGB	0.108	0.039	2.809	0.005	0.034	0.184
H7	GMEP \rightarrow PO \rightarrow EGB	0.089	0.034	2.594	0.010	0.023	0.157

¹ BCI = bias confidence interval; LL = lower limit; S. Beta = standardized Beta; S.D. = standard deviation; UL = upper limit.

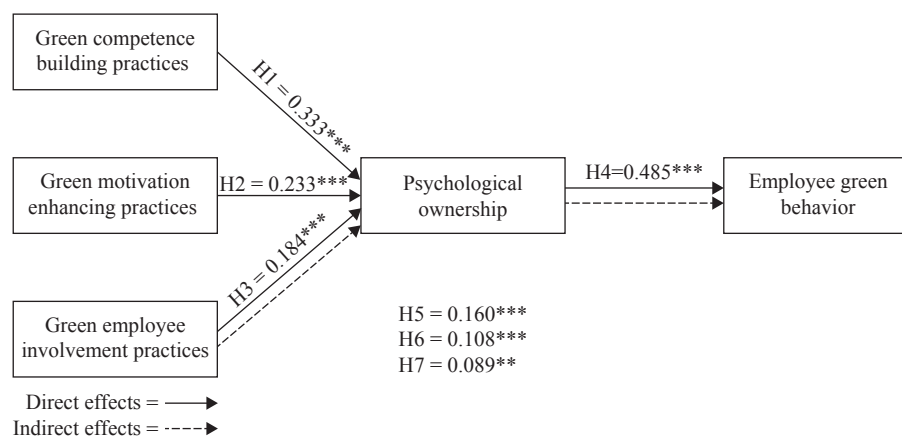


Figure 1. Mediation model of psychological ownership in the relationship between green HRM and green employee behavior ** $P<0.05$, *** $P<0.01$.

5. Discussion

The current study sheds light on green HRM practices which are an emerging area of interest among researchers and practitioners. This study is the first attempt that provided insights into the green practices and behavioral mantra of the fertilizer industry of Pakistan. Nitrogen-rich and phosphate fertilizer industry are the major source of the ambient level of hazardous air pollutants and soil pollution (Bauer *et al.*, 2016; Kassir *et al.*, 2012; Li *et al.*, 2015). Thus, implementing eco-friendly policies and stimulating employee behavior toward green products may improve the environmental performance of the industry. Although a wide range of studies have underpinned the AMO theory to explain the mechanisms through which green HRM executes pro-environmental behavior in the organization (e.g. Jia *et al.*, 2018; Renwick *et al.*, 2013; Yu *et al.*, 2020), little has been explored in the context of a comprehensive AMO framework. We extended the theoretical contributions by introducing the mediating role of psychological ownership between green HRM practices and employee green behavior.

Our findings suggest that the underlying parsimonious framework can be implemented to stimulate individual green behavior in an organization. The findings suggest green competence building practices that include green training, recruitment, and selection develop psychological ownership of the environment among employees through which they behave in an eco-friendly manner. Consistent with prior studies, we argue that when employers recruit employees based on green criteria or green awareness, the more likely they thrive to reduce environmental risks (Yong *et al.*, 2020). In the same way, building green competency in an employee through adequate training and development boost their complementary role to bring environmentally friendly solutions (Anwar *et al.*, 2020) against mineral depletion, acidification of the soil, air pollution, crop burning methods, and waterway pollution. Thus, green recruitment and training of employees enhance their interdependent self-construal focus toward societal well-being and they psychologically own the environmental concerns of their firm (Felix and Almaguer, 2019; Wang *et al.*, 2019).

Our results also suggest that psychological ownership mediates the relationship between green motivation enhancing practices and employee green behavior. Rewarding and appraising employees may help organizations to develop certain mechanisms (such as psychological ownership) that mitigate systematic barriers to sustainability and environmental performance (Süssenbach and Kamleitner, 2018). Green motivating enhancing practices excite individuals to achieve environmental goals through different routes of psychological ownership including investing, gaining knowledge, and controlling environmental issues (Pierce *et al.*, 2001). A reward system is an effective mechanism to foster employee engagement through psychological functioning (Presbitero, 2017; Renwick *et al.*, 2013). Since psychological ownership enhance the satisfaction of rewards (Dawkins *et al.*, 2017), voluntary environmental behavior of employees can be developed when systematic rewards for environmental initiatives are offered.

The findings also revealed that green employee involvement practices significantly affect employee green behavior through psychological ownership. The sense of psychological ownership can be boosted if employees are encouraged to actively participate in certain decisions and activities (Lu *et al.*, 2017). Greater involvement and participation of employees may enhance their sense of empowerment, opportunity, and ownership that satisfy their humanistic needs (Han *et al.*, 2010). Consequently, employees align their interests to the organization's green goals by opting for voluntary eco-friendly behavior and proactively involving themselves in knowledge sharing, idea exchanging, and open discussion to deal with environmental issues (Alt and Spitzack, 2016; Hameed *et al.*, 2020).

Besides theoretical contributions, the findings of the study also provide practical implications. While prior studies consider different industries (Anwar *et al.*, 2020; Pham *et al.*, 2019; Pinzone *et al.*, 2016; Singh *et al.*, 2020; Yu *et al.*, 2020), we apply an AMO-based framework to the fertilizer industry. In this instance, Pakistan is facing severe environmental issues including desertification, natural disasters, soil erosion, pesticide misuse, climate change, noise pollution, and air pollution. Nutrients, pesticides, animal wastes, and sediment are primary agricultural pollutants. Hazardous pesticides may contaminate ground-water resources

and surfaces while the fumes from nitrogen and phosphorus cause air pollutant emissions (Bauer *et al.*, 2016; Hussain *et al.*, 2017; Ullah *et al.*, 2018). Thus, implementing green practices, policies, and indulging employees in pro-environmental behavior is very important for the fertilizer industry.

While recruiting and selecting employees for the firm, employers should ask about innovative ideas to reduce environmental issues caused by the fertilizer industry. Attracting employees with an eco-friendly approach may enhance the organization's environmental innovation and eventually, motivate employees to propose methods to produce environmentally friendly fertilizers. For instance, coating the fertilizers in a natural substance (chitosan, wheat, starch, etc.) may prevent the fertilizers from being delivered all at once. Training and involving employees based on green agenda may also motivate them to explore approaches to avoid the wastage of micronutrients which is one of the main causes of malnutrition in developing countries. Furthermore, continuous training, rewarding, and involvement of employees in pro-environmental activities can enhance their psychological ownership of nature through which they may go beyond their prescribed job responsibilities to develop products or solutions that resolve the issues of waterway pollution and algae bloom caused by excess nutrients from the fertilizers.

5.1 Limitation and future research

This study is not beyond certain limitations which should be accounted for by future studies. We utilized a cross-sectional method and single-source data. Future studies should use a multi-source, longitudinal, and multi-wave approach to provide more robust estimates. Researchers may also focus on other sectors to enhance the generalization of the results using other mediating factors. One of the major limitations of this study is the consideration of only positive aspects of psychological ownership. Future studies should also incorporate the negative effects of psychological ownership such as resistance to change, rejection of new knowledge, and reluctance to share knowledge and ideas with co-workers (Baer and Brown, 2012). A recent study by Cocieru *et al.* (2019) argued that when an organizational representative imposes revolutionary and subtractive changes on the project which is psychologically owned by the employees, negative emotions such as intentions to resist change and decreased level of affective commitment to change may emerge. Furthermore, negative reactions to changes namely the need for control and recipient narcissism caused by excessive psychological ownership may have detrimental effects on organizational functions. Since PO has a 'double-edged sword' effect in organizations, future studies are suggested to estimate if the relationship between PO and employee behavior is curvilinear.

6. Conclusions

Public awareness of environmental degradation is forcing firms to adopt clean practices and technologies. In the face of stakeholder outrage and consumer attitude toward green products, the fertilizer industry cannot achieve long-term sustainability without environmental initiatives and green practices. We contribute to the limited literature on the relationship between green HRM practices and employee pro-environmental behavior. Our results suggest that green HRM practices (ability building, motivation enhancing, and opportunity providing) develop a sense of ownership of nature among employees through which they behave and act in an eco-friendly way. The findings provide fruitful insights to policymakers for enhancing the green behavior of employees through recruitment, selection, training, empowerment, involvement, and the provision of opportunities.

The food and agriculture sectors generate both environmental harm and conserve ecosystem services. This is because these sectors both depend on and impact natural resources (land, water, and biodiversity) in the production process. The pressure on natural resources, climate change, and the recent economic crisis have highlighted the need for a greener model of growth. Green growth is the pursuit of economic growth and development while preventing environmental degradation, biodiversity loss, and unsustainable natural resource use. There is considerable interest in understanding the contribution of the agriculture sector to green growth, and the role of policies in moving towards a greener growth model. The implications of green

growth for agriculture and the contributions of agriculture to green growth can be reciprocal or incongruent. In the short-term, green growth policies which place a premium on environmental protection may constrain agricultural output, reduce global food supply and entail adjustments in the use of human, financial, and natural resources. Adaptation measures may be helpful in the transition towards green growth. But the implications of green growth for agriculture and the food system in the longer-term should be mutually-reinforcing in terms of environmental sustainability (including avoiding resource depletion), economic growth, and social well-being.

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