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Analysing the relationship of adaption of green culture, innovation, green performance for achieving sustainability: Mediating role of employee commitment



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ABSTRACT

Increasing sustainability traction in business and the environmental consciousness of customers have forced multinationals to adopt eco-friendly processes. Despite using the different recycling approaches the textile industry is still fighting with problems like higher water pollution, emissions, and increased carbon footprint. Hence, the need for innovating green products or using sustainable material is growing and researchers still have discordance on the predictor and outcome of innovation in the industry. Considering this, the present study is tried to understand the impact of the environmental consciousness of consumers on the green performance of the textile industry. A conceptual model has been proposed which includes adaptability of green culture, innovation, green performance, and employee commitment. The study uses the data of 198 employees from textile manufacturing organizations through a structured questionnaire. With the help of the structural equation modeling (SEM) technique, it was found that the most relevant factor of innovation is the adaptability of green culture and green performance was found as the major outcome and significant mediating role of employee commitment between innovation and green performance. The findings of the study would help the textile industry managers to create a green culture by creating its link with green innovation and green performance through developing environmental consciousness among the employees which further support the textile industry in pollution reduction.

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1. Introduction

Emerging markets (EM) potential economic growth has lifted millions of people out of poverty, conversely, it has led to budding environmental damage and resource degradation (OECD, 2017). EM dependency on natural resources and their vulnerability to climate change threats poses risks for their future economic growth.

Groundwater depletion, degrading air quality, unavailability of sanitary landfills to dispose of the generated waste are some of the major environmental challenges of EM (EMS, 2017). Certain industries contribute to significant carbon footprint such as the Textile industry specifically, fast fashion, cheap and dirty textiles. EM such as India and China are the largest cotton producers and exporters in the world and half of the global textile industry is in the Asia-Pacific region. The textile industry is water-intensive as it requires water in all stages of manufacturing. The wastewater from textile manufacturing processes comprises of chemicals, salts, dyes, and solvents that are harmful to the environment (Bento et al., 2019; Samanta et al., 2019; Saxena et al., 2017). Today, the textile is one of the most polluting industries and it has been further stated

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that it contributes to total global emission around 5% (Bauck, 2017). Global climate change and environment protection policies enforced manufacturers to adopt environmental procedures and practices. Organizations in EM find managing corporate environmental sustainability a challenging task as they are required to act and behave responsibly towards the environment while focusing on its economic goals (Gupta et al., 2018) with the help of their human resources. In India considering the usage of water, regulatory authorities have enforced wastewater treatment and discharge standards. Therefore, organizations are forced to opt for more sustainable solutions. Some of the innovative sustainable solutions are zero liquid discharge solution, recycling water. Organizations have to frequently develop different strategies to survive in business competition in EM, for example, General Electric Healthcare (an American Multinational) uses different strategies as they make software for diagnostic machines in India and their parts in China, Hungary, and Mexico. Home Depot (headquartered in Georgia, US) is another example of an organization that used different strategies for different markets such as they set up stores in Chile and Argentina markets but failed. Later with the help of greenfield strategy, they entered Mexico successfully and they have been exploring new emerging markets. Hence, there lies the need to innovate. It can be business model innovation, product innovation, or process innovation.

The innovation literature is categorized into: (1) studies related to the process (for instance: Ziegler and Nogareda, 2009; Rennings et al., 2006); (2) studies related to the relationship between innovation and policies (for instance: Demirel and Kesidou, 2011; Kemp and Pontoglio, 2008). Manufacturing products that do not contain dangerous and toxic substances are crucial for organizations today considering global climate change and to raise environmental awareness, hence green innovation has become important and a critical factor for organizations (Chiou et al., 2011; Lin and Chang, 2009). According to Calza et al. (2017) Green innovation refers to the innovative approaches adopted by industries to shift their traditional practices into sustainable operations. Green innovation can be further of different types: product, process or managerial innovation (Chen, 2008). In this study, we have focused on product innovation and not on the processor managerial because an understanding of the determinants and consequences of product innovation is very limited (Kurkkio et al., 2011). Hence, in the context of textile manufacturing industries, the antecedents and consequences of innovation are crucial to understanding.

The pattern of shared basic assumptions about environmental management and problems is defined as green organizational culture (Marshall et al., 2015; Schein, 2010). These assumptions or beliefs values regarding environmental management shape the behaviours of individuals and the green culture has been found to have a positive influence on green innovation (Chang, 2015). Furthermore, organizations with adaptability or adaptability culture take risks and learn from mistakes and have the capability and experience to create change (Denison, 2000; Senge, 1990). These organizations can reform themselves to meet the changing market demands (Eisenhardt and Martin, 2000). Hence, it can be said that organizational culture influence creativity and innovation (Martin and Terblanche, 2003) that can further increase the performance (Danneels, 2002) specifically, green performance.

A key competitive advantage for any organization is human resource management (HRM) (Sun et al., 2007) as it affects the performance of the organization through its influence on employee organizational commitment (Nishii et al., 2008). Employee organizational commitment is a predictor of performance (Caillier, 2012; Anderfuhren-Biget et al., 2010) as employees committed to a particular organization devote more effort to their job. Organizations when using HRM policies to encourage the sustainable use

of the resources and promotes the cause of environmentalism to boost employee morale and satisfaction is described as green HRM (GHRM) (Mampra, 2013). Additionally, they feel strongly about the environment as employees today are more committed as well as satisfied with the organization that is proactive in endorsing green (Ahmad, 2015). To reduce environmental degradation and wastage, international organizations, academicians, and policies framed nationally are focusing on the importance of green initiatives (Rahman et al., 2020). Moktadir et al. (2019) explored several antecedents such as green organizational culture, top management commitment for the implementation of GHRM practices (Kumar et al., 2020) also stated that organizational culture is the most influencing behavioural factor, followed by 'commitment from higher authority'. According to Ng et al. (2010), higher organizational commitment at all levels from senior management to people of the show floor leads to higher innovative work behaviour but there is a lack of empirical research related to it (Jafri, 2010) especially in the Asian context (Nguyen et al., 2019). Hence, exploring the role of employee commitment in innovation is crucial and therefore this work addresses the following research question: 1) what are the major precursors of innovation in the textile industry? 2) what are the major outcomes of innovation in the textile industry? and 3) what is the role of employee commitment in innovation?

Green capabilities have been found as an antecedent of green product innovation (Chen et al., 2012). While current literature comprises various internal and external organizational factors, in this study we have focused on the internal organizational factors as this study focuses on the internal variables such as adaptability of green culture inside the organization and commitment of employees. One of the key antecedents of green product innovation is corporate environmental ethics and culture (Keskin et al., 2013; Chen et al., 2012; Dangelico and Pujari, 2010). In response to the change in the external business environment with flexibility, the adaptability culture has a high potential to change internally (Denison and Mishra, 1995) which contributes to organizational innovation (Daft, 2007) which is important for the firm performance (Danneels, 2002; Cooper and Kleinschmidt, 1995; Brown and Eisenhardt, 1995). It has been found that any improvement made in environmental commitment will affect green innovation as they are related to each other (Keogh and Polonsky, 1998). Additionally, a corporate culture that encourages environmental commitment throughout the company helps in attaining green innovation which can be achieved by setting clear environmental targets, criteria and practices (Dangelico, 2016). Hence, The current study identifies the adaptability of green culture as a major antecedent and green performance as an outcome of innovation. The following objectives have been set for the study based on the literature:

- To find the relationship between adaptability culture and innovation.
- To find the relationship between innovation and green performance
- To test the mediating role of employee commitment between innovation and green performance.

The paper is structured as: firstly, the literature review has been presented along with the hypothesis for the study. In the next section, research methodology has been discussed followed by analysis. The next section is a discussion and implication in which theoretical and practical contributions, as well as managerial implications, have been discussed. The last section presents the conclusion, limitations and future research directions of the study.

2. Literature review

According to Chang (2011), industrial competition patterns are changed due to two environmental pressures i.e., environmental regulation and consumer environmentalism. Therefore, organizations have to change their processes, products and even business models. Developing environment-friendly products and processes by adopting organizational practices such as the use of few or green raw material that aims at reducing the water consumption, emissions (Albort-Morant et al., 2017; Gunasekaran and Spalanzani, 2012) is defined as green innovation. According to Howard-Grenville (2006), successful implementation of green innovation can be achieved by leading organizations and employees through green organizational culture. According to Harris and Crane (2002) Green organizational culture is defined as the set of assumptions, values, symbols, artefacts of an organization that reflected a desire or need to operate in an environmentally sustainable manner. Hence, the culture of the organization is considered green, when the employees seek to reduce the profit-seeking purposes and encourage organizational action's that have a positive influence on the environment (Roscoe et al., 2019). As culture has been found a predictor of innovation but empirical studies on this are limited. Either the studies have focused on the cultural element (Lin et al., 2013; Buschgens et al., 2013) or have pointed to the need for empirical studies (Nakata and Di Benedetto, 2012). Further, what type of culture is effective and can help in innovation and employee behaviour is still not clear. Concerning improvement in organizational performance, several studies have focused on innovation that helps in enhancing it (Koc and Ceylan, 2007). But despite having a wide scope of innovation in the literature scholars pay less attention to green innovation (Gürlek and Tuna, 2017; Lin et al., 2013; Chen et al., 2006). Based on the literature review it was found that there are studies that have focused on service and manufacturing industries in western countries but there is very less attention given to green innovation specifically textile industries in India. The present study aims to bridge this gap by exploring the antecedents and consequences of innovation as pointed by Crossa and Apaydin (2010) that to advance the research on innovation it is important to test the relationship between innovation determinants and their outcomes. Therefore, the literature review is looking into three aspects such as adaptability culture and innovation, innovation and green performance and the mediating role of organizational commitment.

2.1. Conceptual framework and hypothesis development

2.1.1. Adaptability culture and innovation

"Adaptive culture" (Kotter and Heskett, 1992) has been described as the range of cultural attributes that enables an organization to become more adaptive to environmental changes by helping "organizations anticipate and adapt to the environmental change". One of the essential features of an organization in the contemporary environment identified in competitive sustainability (Wei and Lau, 2010) is adaptability. Hence, to survive and compete, organizations must understand the importance of cultural adaptability (Schein, 1992). The research on green innovation has been growing over the past few years (Dangelico, 2016). Due to increasing social and political pressures organizations are gradually creating an environment that is more adaptive as well as contributes to the green innovative products (Song et al., 2020). Organizational adaptive culture can facilitate its innovation (Woodman et al., 1993) and the culture of the organization is one of the critical factors for innovation performance (Herbig and Dunphy, 1998). If any organization have an adaptive culture then they have a high potential to change internally concerning a change in the external

conditions (Denison and Mishra, 1995). The working environment or the organizational culture encourages or influences the innovation capacity of the employee and the organizations that are engaged in continuous innovation and development of knowledge and capabilities can enhance their performance as developing a new product is a precursor to organizational performance (Chan et al., 2017). The adaptation of green culture depends on three key factors: managerial, internal and external (Law and Gunasekaran, 2012). Managerial includes mindset or strategic policies; internal includes the system and performance and external factors include competition, market trends, law and regulations. The different influence level of these factors within an organization determines their adaptation level to sustainable development. Hence, we propose that:

H1. There exists a relationship between adaptability culture and innovation

2.1.2. Innovation and green performance

The adoption of green practices would result in the improvement of green/environmental performance (Zhu and Sarkis, 2004). According to Olsthoorn et al. (2001) Green performance is defined as the measurement of the interaction between the business and the environment. Product innovation can be the idea generation or creating something new that is reflected in the changes made in product or services by the organization (Prajogo and Ahmed, 2006). Earlier studies have found a relationship between innovation and performance and clearly defines the importance of innovation for the firm's performance (Danneels, 2002; Cooper and Kleinschmidt, 1995; Brown and Eisenhardt 1995). This can be explained further with the help of various empirical studies on green innovation that have stated performance as the major outcome specifically, environmental performance (Singh et al., 2020; Huang and Li, 2017; Kucukoglu and Pinar, 2015; Weng et al., 2015; Alhadid and As'Ad, 2014; Chiou et al., 2011) and firm performance (Zhang et al., 2019; Tang et al., 2018; Handayani et al., 2017; Lin et al., 2013). Additionally, there exists a relationship between environmental innovation and performance (Carrion-Flores and Innes, 2010), green innovation and business performance (Gluch et al., 2009), eco-innovation activities and market performance (Pujari, 2006). Based on the above discussion, we assume that innovation has an association with green performance. Hence, this study hypothesizes that.

H2. There exists a relationship between innovation (green product) and green performance.

2.1.3. Mediating role of commitment

Employee commitment refers to the intentions to behave in some way that is beneficial to the organization. Further, according to Klien et al., this area of study has a long history but in the environmental sustainability context, it was first explored by Polonsky in 1998. Hence, the environmental aspect recently emerges as a research focus. In this study, we have focused on the affective commitment of employees. Innovation initiatives by employees rely on their commitment (Youndt et al., 1996). Employee commitment has a positive relationship with turnover (Steers, 1977). Employees with less commitment only show the required behaviours for employment (Riketta, 2002). Also, employees can go beyond their regular responsibilities if they are proud to work for the organization hence, demonstrate employee commitment and these committed employees are often loyal that results in better performance (Allen and Shanock, 2013; Jaworski and Kohli 1993). Employees commitment to the environment rely on their desire to share and care about the environmental concerns of their organization (Paille and Valeau, 2020). Hence, Organizational green goals

can be achieved if the employees are committed. It has been found that higher levels of employee commitment led to enhanced organizational performance (Arthur, 1994; Owens 2006) and also increase organizational productivity. Additionally, top management commitment towards the environment influences their employee commitment (Aguinis and Glavas, 2012). In brief, employee commitment to change (here, adopt green behaviour) is important for the operational process of an organization and its ability to innovate product that satisfies the environment and market need (Hasu et al., 2014). Employee commitment to change positively influence their perceptions which in turn improves performance (Nohe et al., 2013). Conversely, without commitment, the innovation may be difficult to achieve (Herscovitch and Meyer, 2002) and it will affect the performance. Based on the above discussion, we propose that.

H3. Commitment mediates the relationship between innovation and green performance

H3a. : There exists a relationship between innovation and commitment

H3b. : There exists a relationship between commitment and green performance

Fig. 1 proposes a conceptual framework for the study which shows the relationship between adaptability culture, product innovation, commitment and green performance.

3. Research methodology

The research methodology framework for the study has been presented in Fig. 2. Initially, problem identification and literature review have been conducted (described in Section 1, 2 and 3) related to adaptability culture, innovation, green performance and commitment in the textile industry. Then, a structured questionnaire has been used for data collection from the middle-level employees working in textile manufacturing organizations in India. Further, the assessment of the model has been carried out such that for measurement model assessment: unidimensionality was checked using exploratory factor analysis. Internal consistency reliability was checked using Cronbach's alpha and composite reliability. Indicator reliability has been checked using indicator loading. Convergent validity was checked using Average variance extracted while discriminant validity was checked using cross-loadings, Fornell-Larcker criterion and HTMT_{0.85} criterion. Further, indicator validity was checked using indicator weights and variance inflation factor (VIF), construct validity using inner construct correlations. For structural model assessment: Model validity has been

assessed using the coefficient of determination (R^2), Path coefficients and T value, effect size (f^2), Predictive relevance (Q^2), goodness of fit index, standardized root mean square residual. After model validation, hypothesis testing results have been presented and interpreted.

3.1. Questionnaire design

A structured questionnaire has been designed to collect the data through paper and pen survey. It comprises of two sections: A and B. Section A consists of demographic details of respondents such as age, educational qualification and gender, while section B comprises the constructs used in the study. The minimum sample size for the pilot study can be thirty or above (Browne, 1995). As some items of the scale have been modified therefore a pilot study of thirty-seven respondents were collected from industry professionals as well as from the academicians. After making the relevant language correction and modifications based on the suggestion received, the final questionnaire was then used for data collection.

3.2. Variables and measurement

Green Performance has been used as a dependent variable. It has been measured using Yu et al. (2017) nine-item scale (for instance: our firm conforms with requirements of inputs of energy) Adaptability culture has been measured using three items from previous studies (Denison and Mishra, 1995; Lau and Ngo, 2004) (for instance: The culture of this firm can be regarded as flexible). Innovation, here product innovation has been used. Green product innovation has been measured using Chang (2019); Chen (2008); Chen et al. (2006); scale having three items (for instance: The enterprise uses materials with the least pollution during the process of product development, design, or production). Employee commitment towards the environment has been measured using three items (the modified scale that has been developed by Raineri and Paillé, 2016) (for instance: I care about the environmental concern of my organization). All the items were measured on a five-point Likert scale. The items for each construct have been mentioned in Table 2.

3.3. Sample and data collection

The questionnaire was sent to textile manufacturing organizations in the Delhi National Capital Region (NCR). A representative of each organization was given two questionnaires. The questionnaire

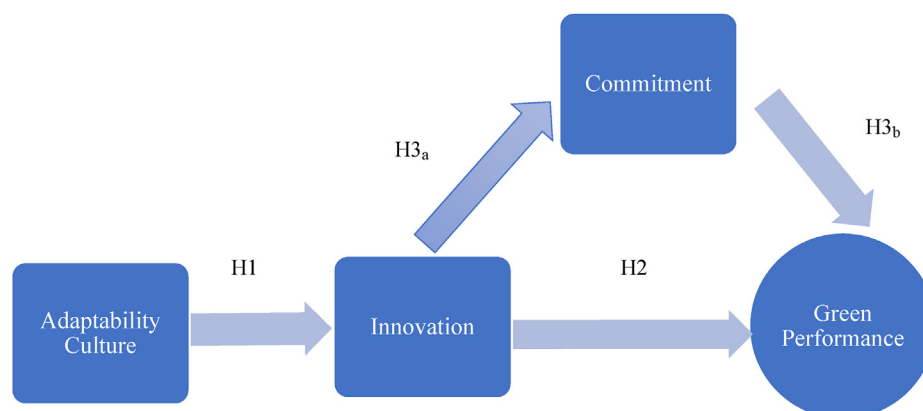


Fig. 1. Proposed conceptual model.

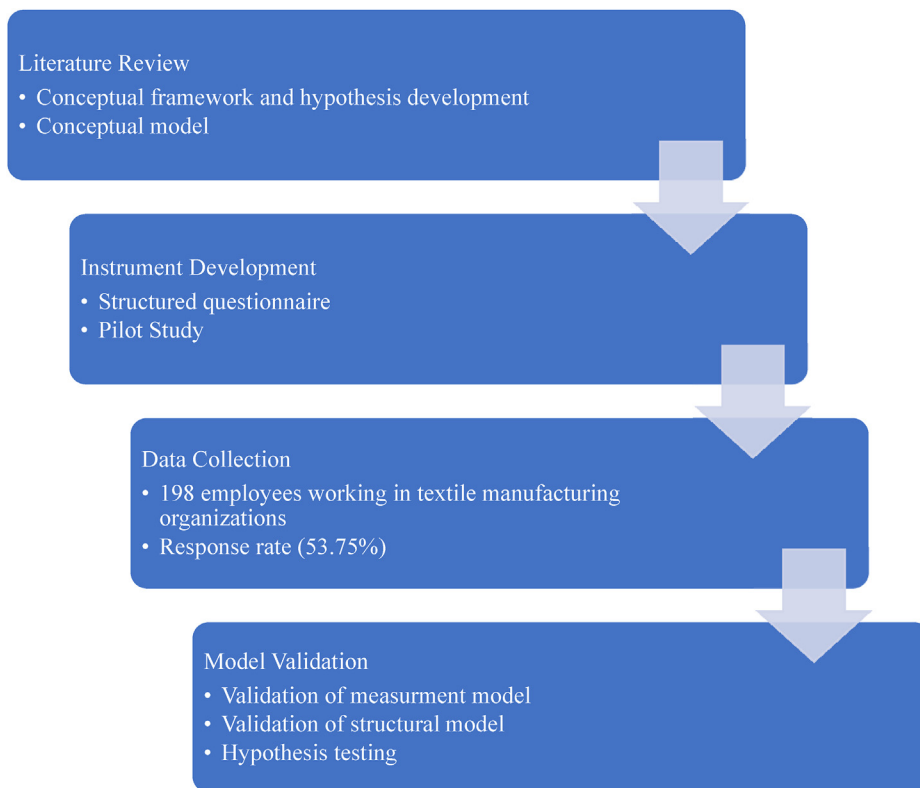


Fig. 2. Research methodology framework.

was attached with a cover letter that elucidates the study objective along with the guidelines and instructions to fill it. Data was collected between August 2019 to January 2020, and to collect the data snowball sampling method (Johnson, 2014) was used as it was hard to approach the senior managers for the researcher. A total of 215 questionnaires were collected (response rate of 53.75%). Out of 215 questionnaires, only 198 were used for further analysis due to incomplete information provided by the respondents. Based on the minimum sample size estimation method of the “10 times rule” in PLS-SEM (Hair et al., 2011), 198 is acceptable sample size for the present study. Table 1 shows the respondents details.

4. Analysis

Partial least square equation modeling technique has been used by SmartPLS 3.3.2, the results are shown in Fig. 3. PLS is recommended for a small sample size (Agarwal and Karahanna, 2000) and is widely accepted as a method for testing research model (Zhu et al., 2012) at early stages which have not been used extensively, therefore, we have used this technique. Model reliability and validity are shown in Tables 2 and 3. Composite reliability values

should be greater or equal to 0.7 to be reliable (Hair et al., 2014). Table 2 reveals that the composite reliability value is 0.88 for commitment, 0.93 for green performance, 0.93 for adaptability culture and 0.83 for innovation. Further, the analysis results reveal that all variables have a satisfactory i.e., above 0.70 level of internal consistency reliability. In this, the average variance extracted value is 0.72 for commitment, 0.65 for green performance, 0.88 for adaptability culture and 0.75 for innovation. Since all values are above 0.5 (Fornell and Larcker, 1981), the measures used in this study have a high level of convergent validity while discriminant validity has been assessed using Fornel-Lacker criterion. The average variance extracted (AVE) should be more than 0.50 (Chin, 2010). The table shows the square root of AVE of construct Adaptability culture, commitment, innovation and green performance is greater than the corresponding latent variables correlation. For example, The AVE of adaptability culture is 0.88 and its square root is 0.93. Therefore, 0.93 is greater than the correlation values in the column of adaptability culture and similar is the case with all other variables. Additionally, all heterotrait-monotrait ratio of correlations (HTMT) values were also less than 0.85 (Henseler et al., 2014), hence the establishment of discriminant validity based on

Table 1
Respondent details.

Age	Less than 25	25–35	35–45	More than 45
	42 (21%)	82 (42%)	62 (31%)	12 (6%)
Gender	Male	Female		
	132 (67%)	66 (33%)		
Education qualification	High School	Graduation	Post-Graduation	PhD
	21 (11%)	97 (49%)	71 (36%)	9 (4%)
Managerial Level	Executives	Middle-Level Managers		Senior Level Managers
	25 (12%)	111 (56%)		62 (32%)

Table 2
Constructs and their Indicators, loading, reliability estimates and convergent validity.

Constructs and their indicators	Item Loading	Alpha	Rho_A	CR	AVE
Commitment		0.80	0.81	0.88	0.72
I care about the environmental concern of my organization (COM1)	0.864				
I feel as if my organization's environmental problems are my own (COM2)	0.856				
I would feel guilty about not supporting the environmental efforts of my organization (COM3)	0.828				
Green Performance		0.93	0.93	0.94	0.65
Our firm conforms with the requirements of inputs of energy (PER1)	0.853				
Our firm conforms with the requirements of community relations (PER2)	0.764				
Our firm conforms with the requirements of outputs of air emissions (PER3)	0.755				
Our firm conforms with the requirements of indicators on the local, regional or national condition of the environment (PER4)	0.831				
Our firm conforms with the requirements of outputs of waste-water (PER5)	0.818				
Our firm conforms with expectations of implementation of environmental policies and programs (PER6)	0.877				
Our firm has achieved an important environment-related certification (e.g. ISO 14031) (PER7)	0.781				
Our firm has regularly achieved targets for energy conservation, recycling or waste reductions (PER8)	0.806				
On average, the overall environmental performance of our company has improved over the past five years (PER9)	0.787				
Adaptability Culture		0.934	1.03	0.95	0.88
The culture of this firm can be regarded as flexible (ADC1)	0.99				
Our firm values adaptability and responsiveness to change (ADC2)	0.82				
Our firm emphasizes creativity and innovation (ADC3)	0.98				
Green Product Innovation		0.833	0.86	0.90	0.75
The enterprise uses materials with the least pollution during the process of product development, design, or production. (INN1)	0.928				
The enterprise uses the most energy-efficient materials during the process of product development, design, or production (INN2)	0.857				
The enterprise examines whether products are easily recycled, reused, and decomposed during the process of product development, design, or production. (INN3)	0.809				

Note^a: For reliability (CR > 0.70), convergent validity (CR > AVE>0.50) and discriminant validity (MSV < AVE).

^a Hair et al. (2010).

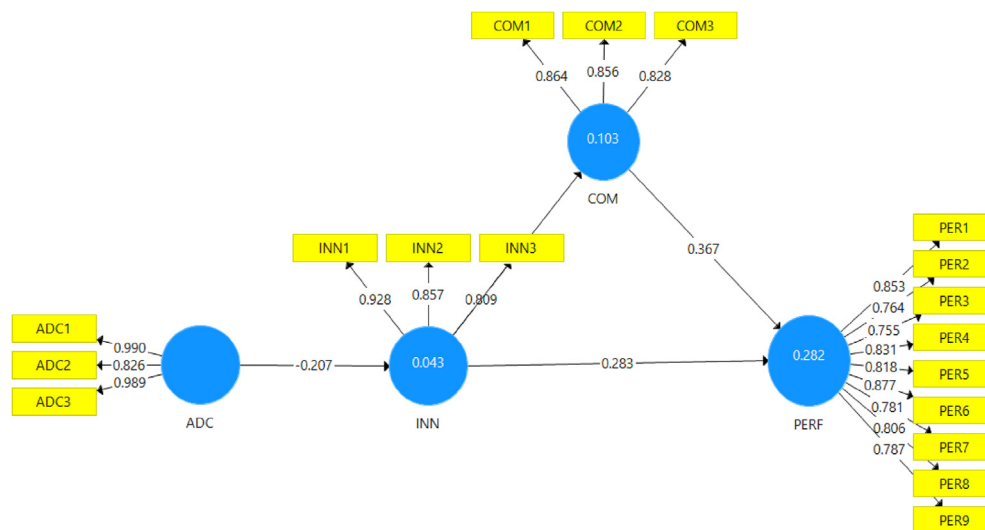


Fig. 3. PLS SEM results (ADC- Adaptability Culture, INN- Product Innovation, COM- Employee Commitment, PER- Green Performance).

Table 3
Discriminant validity (Fornell-Larcker criteria).

Construct	Adaptability Culture	Commitment	Innovation	Green Performance
Adaptability Culture	0.938			
Commitment	-0.058	0.850		
Innovation	-0.207	0.320	0.866	
Green Performance	-0.078	0.458	0.401	0.809

HTMT_{0.85} criterion.

4.1. Structural model evaluation

To assess the collinearity, the variance inflation factor (VIF) values were calculated. VIF values should be less than 3 (Hair et al.,

2019). All the values were less than 3 for the exogenous construct which indicates no concern of collinearity issues (refer to Table 4). Further, identifying the direct relationship between the variables, the mediator was added to the model. The model was tested using the bootstrapping method (5000 subsamples) to assess the significance of the outer loading of proposed hypotheses. The outer

Table 4
Variance inflation factor.

Variables	Adaptability Culture	Commitment	Innovation	Green Performance
Adaptability Culture			1.000	
Commitment				1.114
Innovation		1.000		1.114
Green Performance				

loadings were more than 0.7 at a significance level $p < 0.001$. Common method bias (CMB) is very frequent in self-stated surveys. Therefore, to tackle the CMB, process orientation and statistical solutions by Podsakoff et al. (2012) were applied. In the process-oriented solutions step the data were collected from one source; several sources procedure was used. Apart from that several rearrangements in the order of the items were applied to maintain the confidentiality of answers, Moreover Harman’s single factor (<50%) and common latent factor (CLF < 50%) were also calculated; found that the data is free from CMB issue. After the above procedure, data from 198 respondents were considered.

The coefficients of direct as well as indirect path reveal that the structural model relationship is statistically significant as shown in Table 5. R square values of commitment are 0.103, Innovation is 0.043 and green performance is 0.282. In behavioural sciences, according to Giao et al. (2020), R square values above 0.26 are considered a large effect, 0.13 as moderate effect and 0.02 as a small effect. Additionally, according to Ritchey (2008), in social science, the R square values between 0.04 and 0.16 can be described as moderately weak while values between 0.2 and 0.49 as moderately strong. Hence, based on these criteria green performance has a moderately strong effect, while commitment and innovation have a moderately weak effect on the model. As the R square for green performance was 0.282 which indicated that 28.2% of the total variation of green performance may be explained by employee commitment, green product innovation and adaptability culture. Hence, proved the model-data fit. Path coefficient and hypothesis testing results are shown in Tables 5 and 6. The t value of the path (ADC → INN) is 2.966 with a p-value of 0.003, which confirms the relationship between adaptability culture and innovation. Hence, supports hypothesis 1. The t value of the path (INN → PERF) is 4.855 with p-value 0.00, which confirms the relationship between innovation and green performance. Hence, support hypothesis 2. The t value of indirect path (INN → COM → PERF) is 2.536 with a p-value of 0.01, confirms the mediating role of commitment between the relationship of innovation and green performance. Hence, supports hypothesis 3. Q^2 (cross-validated redundancy) was calculated using the blindfolding procedures (Tenenhaus et al., 2005) and for green performance, it was 0.175 which was greater than the threshold limit (greater than zero) supporting the path model predictive relevance.

The standardized root means square residual (SRMR) values of the saturated, as well as an estimated model, were 0.057 and 0.057 respectively. These values were below the threshold limit (between 0 and 1) that indicates the model goodness of fit (Hair et al., 2019; Henseler, 2015). Hence, the model is parsimonious and plausible

Table 5
Path coefficients.

Path	t-value	p-value
ADC → INN	2.966	0.003
COM → PERF	5.852	0.000
INN → COM	3.416	0.001
INN → PERF	4.855	0.000
INN → COM → PERF	2.536	0.011

Table 6
Hypothesis testing result.

Hypothesis	Path	p-values	Decision
Hypothesis 1	ADC → INN	0.003	ACCEPTED
Hypothesis 2	INN → PERF	0.000	ACCEPTED
Hypothesis 3	INN → COM → PERF	0.011	ACCEPTED
H3 _a	INN → COM	0.001	ACCEPTED
H3 _b	INN → PERF	0.000	ACCEPTED

(Henseler et al., 2016). Cohen f^2 was used to examine the effect size where $f^2 \geq 0.02$, $f^2 \geq 0.15$, and $f^2 \geq 0.35$ represent small, medium, and large effect sizes, respectively (Cohen, 1988). The effect size measures if an independent variable has any impact on the dependent variable. Here, the f^2 of employee commitment represents a large effect on green performance while green product innovation has a medium effect on green performance.

5. Discussion and implications

The study findings reveal the relationship between adaptability culture, innovation and green performance. Both the study hypothesizes (H1 and H2) have been supported. Hence, in textile industries organizations that have an adaptative culture or enables an organization to adapt to environmental changes textile industries should innovate to increase their green performance. Employee commitment further has a mediating role in green product innovation and green performance supporting hypothesis H3. The growing need for business to integrate environmental management into their practices gave rise to the concept of GHRM that includes the practices for conservation and preservation of the natural environment (Guerci et al., 2016). Moreover, integrating environmental goals in organizational strategies and mission improves organizational image as well as its performance.

In this study we have focused on GHRM research in the Indian context, an emerging economy to explore the ways by which an organization can enhance its performance through employee commitment. Eco-friendly behaviour is more costly and effortful than eco-unfriendly behaviour (Ohtomo and Hirose, 2007). The top management eco-friendly behaviour, their commitment may influence employee behaviour and commitment (Raineri and Paille, 2016). Singh et al. (2013) identify that commitment of top management is one of the performance measures for environmentally conscious manufacturing. With the implementation of green practices and policies, employees will become conscious. Also, with proper rewards, compensation packages (Govindarajulu and Daily, 2004) employees can be motivated to adopt these practices in routine, and ultimately achieve environmental goals. Moreover, an adaptability culture of the organization can help them detect, recognize and evaluate adaptive attributes that may further aid in surviving the competition. Though adaptability culture was found as a major antecedent of innovation (Verdu-jover et al., 2017) in our findings, there was a negative significant relationship which states that the textile manufacturing firms rate of adaptation of green culture is low or lacking. There can be multiple factors that are responsible for this. According to the report of ASSOCHAM (2015)

the absorption rate of technology is slow in India as with up-gradation in the technology there is an increase in the skill requirement. Due to this fear of skill requirement, textile firms are hesitant in upgrading technology besides having schemes available from the government such as Technology Up-gradation Fund Scheme and in 2022, the shortfall in skills (26.2 million people) is estimated. Additionally, according to the report power shortage, counterfeiting and competition from other countries such as Bangladesh affect the level of investment and innovation. As power shortage forces the organization to use a manual machine that increases the cost and decrease the quality. Also, if one can imitate an innovation at a cost lower than the innovator, it is likely to kill the innovator's incentive to carry further innovation or any research and development. Hence, these might be the reason why it is delayed or very less innovation that influence the firm's green performance. But these specific reasons we have confined to our study sample as there are companies in India who have adopted international standards of sustainable manufacturing such as Century Rayon in 2014 was the first company in India that was awarded Sustainable Textile Production (STeP) certificate by OEKOTEX, which is the certification for the textile companies that want to communicate their sustainable production to the public credibly and transparently.

5.1. Implications for theory and practice on cleaner production/sustainability

5.1.1. Theoretical implications

Existing models of innovation process such as the model by Hauser (1998), West and Farr (1990), Woodman et al. (1993) suggested the importance of organizational culture variable in their innovation models (Gudmundson et al., 2003). Further, it has been found that cultural adaptation influence innovation in an organization (Kanter, 2000). However, what type of organizational culture or traits is useful for innovation is not explained or empirically tested. Hence, the findings of our study suggest that adaptive organizational culture is crucial for innovation in the organizations and add to the existing literature of organizational culture influence on innovation. Considering the significance of innovation in the textile industry, this study gives answers to the question: What are the antecedents and consequences of innovation in the textile industry? Moreover, studies about green performance are in the initial stage and the literature is very limited (Wang, 2019; Zhang et al., 2019). Hence this study further adds to the literature of green performance along with adaptability culture and employee commitment. Educating the consumers and creating awareness regarding the use of green products and their societal outcomes may induce consumers to buy these products (Tandon et al., 2020). Additionally, to build the trust in consumer's minds regarding the authenticity of the products, the consumers can be made aware regarding various certifications. The knowledge received through these awareness campaigns can influence the behavioural choice and ethical consumption intentions of the consumers which may help in converting non-buyers into buyers (Kushwah et al., 2019) as when people became aware of the various environmental problems their intentions and attitude changes (Sharma and Bansal, 2013). Earlier studies have also confirmed that environmental concern influences environmental attitude (Trivedi et al., 2018; Yadav, 2016; Yadav and Pathak, 2016) and consumers high in environmental concerns tend to buy more green products (Yadav and Pathak, 2016).

5.1.2. Managerial implications

The current research presents interesting managerial implications and practical perspectives for organizations that are seeking

to become greener. There are several environmental management systems available that can help an organization achieve environmental sustainability, greening the processes of the organization or maybe workforce but it is very costly to implement it and the majority of the organizations may not be able to adapt it (Jackson et al., 2012; Palmer et al., 1995). Hence, other methods such as changing the employee behaviour towards the environment by increasing their commitment to avoid non-green behaviour along with the organizational adaptability culture can help the organization achieve environmental sustainability improvement or increase the organization green performance. Thus, the above argument is supported by these study findings as we found that employee commitment has a crucial role in innovation and green performance of the company and organization can develop green HR practices and training modules to shape employee commitment towards the green behaviour that can ultimately help in increasing their green performance.

The present study was found to be in line with the findings of Conding and Habidin (2012) that green innovation has a positive effect on green performance. Based on the study finding we suggest that the industry managers can develop the adaptive culture as it will influence green product innovation that will contribute to green performance. They can develop this culture by measuring, evaluating and supporting positive environmental behaviour of the organizational members by giving them rewards or incentives, stating clear green goals of the organization to the employees and introducing green HRM policies and practices in the organizations. Additionally, increasing the green product innovation can also increase the organizational competitive advantage (Chang, 2011), one of the key factors in surviving the global competition.

Organizations that will create an appropriate culture and climate will be most innovative in future and if the culture is not conducive, innovation fails (Szczepańska-Woszczyzna, 2015; Ahmed, 1998). Our findings suggest that building an adaptive culture influence innovation and innovation in turn have a positive impact on green performance. This finding indicates that if the Indian textile industry has a high adaptive culture, they may quickly respond to the environmental changes and comes up with an innovative product or processes. For instance: During COVID 19 and under nationwide lockdown, the textile industry has been badly hit and currently to cope up with the market demands they are manufacturing fashionable masks and planning to export. However, countries such as Bangladesh and Vietnam have already started exporting these masks (Times of India, 2020). This delay in coping with the environmental situations is due to the lack of Indian textile companies' adaptive culture which affects their innovation.

Currently, the Indian government schemes and policies are focused on technology up-gradation, skills development and up-gradation, employment, attracting investments and modernization but there are no policies to assess the adaptability culture of these textile companies which has around 45 million workers employed and is the second-largest producer of textile in the world. We suggest that standardization of culture-related policies should be set by the policymakers or the organizations' board so that the existing policies and schemes can succeed. The Indian textile industry consists of a huge number of small-scale market players that makes the market competitive. The entry of foreign MNCs in India further adds to the competition. Therefore, concerning the existing competition, the companies can focus on green product innovation and industry-specific strategic culture and roadmap should be developed to achieve sustainability goals. Certain other recommendations along with the examples that could help the textile manufacturers to increase their green performance are: They can adapt a zero-waste action plan; increase the green commitment of

top management to increase the employee creativity and innovation in manufacturing processes and products; Mostly industries are currently using the recycling approach such as SMEs in Asia's biggest recycling hub, Panipat (Delhi NCR- Haryana subregion) collect the discarded clothes from all over the world and recycle it. However, the increased textile dumping still needs a better solution and adaptive culture awareness in these type organizations is a must; they can adopt the textile circular economy approach as initiated by some of the Indian start-ups such as Kiabza, Lionise; using digitization technologies such as Trustrace, which is using a blockchain technology for improving its transparency and traceability in the supply chain; new organized models can be developed by organization for collection of used clothes such as "Myntra" (E-commerce player in Fashion) collaborated with NGO (named Goonj) where the online shoppers can exchange their used clothes and that can finally be distributed to needy people by Goonj; Medical textile is another area where Indian textile companies can enter as presently there is less awareness of medical textile amongst people in India as it is under crises situation (COVID pandemic) the authorities have urged the textile industry to produce innovative and reusable personal protective kit.

6. Conclusion, limitations and future research directions

Firstly, managers, today realize the importance of innovation in the organization but fails to implement it. Hence, building adaptive culture in the organization can aid innovation i.e., the major contribution of our study. Secondly, the present study has not only focused on the textile industry innovation in India but have also explored the role of employee commitment that is crucial for the green culture of the organization. This contribution of the study bridges the existing gap in the literature concerning innovation in the Indian textile industry. The study model not only explored the predictor and outcome of innovation but also explored the role of employee commitment in enhancing the green performance of the firm. Hence, we conclude that building adaptive green culture in the textile industries will help in making the company's innovative. Further, the key recommendations are: to encourage policymakers to develop policies that can aid in measuring the use of the existing schemes, by imposing strict control over the illicit markets and providing uninterrupted power supply to this sector.

This study is survey-based which has certain limitations as it is a cross-sectional study but a longitudinal study can give a better evaluation of the employees and organization adaptability culture. Future studies may use other variables such as top management commitment to the conceptual model tested or the control variables. Additionally, the study conceptual model relationships can be affected due to some underlying moderating variables. For instance, employee commitment is positively influencing green performance. The commitment of employees may be dependent upon leadership style and behaviours in an organization, Respect for People pioneered by Toyota Production System, Employee Ownership and accountability (not command and control leadership), reward and recognition at a team level and individual levels etc. Similarly, if we say product innovation influences Green performance in a positive way, but there can be some moderating variables that affect this relationship. These elements are not explored in the study but they should be explored in future studies and hence this could be a limitation of the study. The study can be done in different industries or a comparative study of industries can be done. The study sample is limited to Delhi National Capital Region (NCR) so future studies can increase the study sample size to get more refined results and it can be done in a different geographical context. As two questionnaires were provided to each company, most likely the sample collected is one or a maximum of

two per company. Therefore, the consistency of the responses from each company is unknown unless we collate multiple samples per company. This might raise inter-rater reliability issues, thus the limitation of the study.

Credit author statement

Sahiba Sharma: Ideas; Conceptualization, Writing – original draft Preparation, Methodology; **Gyan Prakash:** Conceptualization, Writing – original draft Preparation, Methodology; **Anil Kumar:** Formal analysis, Conceptualization, Methodology, Formal analysis, Analysis; **Eswara Krishna Mussada:** Project administration, and Context Robustness; **Jiju Antony:** Supervision, Project administration, and Context Robustness; **Sunil Luthra:** Ideas; Conceptualization, Formal analysis, and Analysis

Declaration of competing interest

The authors declare that they have no known competing interests or personal relationships that could have appeared to influence the work reported in this paper.

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