
Role of artificial intelligence and smart technology to strengthen the impact of green HRM on Green Performance for a better tomorrow

Manish Naresh Bharthi^{1*}, Dr. Prakash Tiwari², Dr. Pankaj Kumar³, Dr. Rakesh K. Pandey⁴

^{1*}(Corresponding Author), Research Scholar, DIT University, Dehradun-248001, Uttarakhand, India

Email:1000018874@dit.edu.in, 0000-0003-2405-1825

²Professor, DIT University, Dehradun-248001, Uttarakhand, India,

Email:drprakash.tiwari@dituniversity.edu.in, 0000-0002-1915-6756

³Assistant Professor, DIT University, Dehradun-248001, Uttarakhand, India

Email:pankaj.kumar@dituniversity.edu.in

⁴Assistant Professor, DIT University, Dehradun-248001, Uttarakhand, India

Email: rakesh.pandey@dituniversity.edu.in, 0000-0002-5845-094x

Abstract

The study aims to explore impact of green human resource management practices, such as green skill development (GSD) which contributes to training and equipping the employees with environmental knowledge and sustainable behaviours, green motivation (GM), i.e. employees' passion towards eco-friendly or pro-environmental behaviour, green involvement (GI) which links to employees participation and commitment in promoting sustainability at workplace, green empowerment (GE) refers to providing opportunities and resources to employees to pro-actively participate in sustainability practices, green capability of organisation (GC) referring to ability of organization to adapt sustainable practices and analyse the impact of technology considering STARA as a mediator on the organisation's green performance (GP). A quantitative approach was employed to gather data from 257 respondents using a seven-point Likert scale. Structural equation modelling was used to analyse the data. The findings showcase the positive effect of GHRM practices on green capabilities; STARA positively mediates the relationship between green capabilities and green performance; also, green capability significantly impacts green performance. The study fills the gap in the existing literature by providing empirical suggestions on the application of STARA with GHRM, green capabilities and green performance, and the investigation provides valuable academic and practical insights for organisations and employees for leveraging STARA to support sustainability.

Keywords: Green HRM, Green Performance, STARA, Artificial Intelligence, Organisation Performance

Introduction

The problems associated with environmental pollution is bringing some devastating consequences to the world such as increasing sea level, extreme droughts, global warming and changing weather patterns (Junsheng et al., 2020; Doghan, 2024). These consequences are adversely impacting the social and economic activities of the world. The green human resource management practices are working to provide a more realistic way for organisations to create human capital, which can improve the environmental performance and sustainable development of the organisations (Cheng, 2020). But many companies are still struggling to effectively manage the environmental

behaviour of the employees (Ali et al., 2023). There is still a discrepancy between the environmental policies drafted by every organisation and the actual behaviour patterns of the employees (Birdi et al., 2016; Hofmann et al., 2012). The companies can fill this gap between rhetoric and reality through improving their GHRM practices (Tang et al., 2018). Green HR focuses on collective and individual efforts to bring out green behaviour. Green HRM is using HRM practices to support the sustainable use of resources in the firm to support environmental sustainability (Doghan, 2024). According to Roscoe et al. (2019, GHRM practices also help companies in proving their overall green performance and green capabilities, which have now become significantly important for organisations considering the present

era. Many organisations tackle their green performance through green HRM and green capabilities through some extra green initiatives (Yook et al., 2018). Studies have suggested that involving and empowering employees in the green objectives of the firm inspires them to engage more in green activities and improves their green abilities (Ahmad, 2015; Chams & García-Blandón, 2019; Abdulaziz et al., 2017). Green HR practices help organisations and environmental sustainability by performing several environmental and strategic movements, which play a vital role for organisations by helping them accomplish their objectives related to green performance (Hofmann et al., 2012a). Green skill development allows companies to take rational decisions regarding the current environmental and economic issues (Chams & García-Blandón, 2019). Whereas, green motivation can be considered as a green practice of love, passion and curiosity towards eco-friendly and pro-environmental behaviour (Ogbeibu et al., 2024). Green Involvement plays a very important role in sustainable organisational performance and also in running the economy sustainably. Green empowerment, on the other hand, improves an individual's capacity and alertness to maintain the hygiene of the environment, clean sanitation and a sustainable environment (Pham et al., 2019).

If we align green HRM practices with organisational strategies, then it not only enhances green involvement, green empowerment, green skill development and green motivation, but it also helps in building strong green capabilities which serve as the foundation for achieving superior green performance (Gluch et al., 2009; Renwick et al., 2013; Braz & Marotti de Mello, 2022). However, in the contemporary technological era, the role of STARA (Smart Technology, Artificial Intelligence, Robotics, and Algorithms) has become pivotal (Oosthuizen, 2019). STARA technologies allow organisations to operationalise their green capabilities more effectively by facilitating real-time monitoring of environmental practices, optimising resource consumption, and predicting ecological risks through data-driven decision-making (Brougham & Haar, 2018). By integrating STARA with green HR initiatives, firms can strengthen

employee engagement in sustainability practices, as technology provides both the tools and insights necessary for employees to align their behaviours with environmental objectives (John et al., 2009).

1. *RQ1: How can Green HRM practices within an organisation facilitate green performance in the organisation?*
2. *RQ2: Does technology STARA adoption strengthen the impact of green HRM on organisational green performance?*

The study findings will support academic research and facilitate policymakers or decision makers at organisations to explore the ways to adopt and implement technology to follow green HRM practices robustly, create greater sustainable avenues for employees to participate, and educate to enable ways to effectively integrate technology within green HRM frameworks to achieve a higher sense of green performance across organisations

2. Literature review and hypothesis development

2.1. Green Skill Development (GSD), Green Capability (GC), STARA and Green Performance (GP)

Presently, many researchers believe that the improvement in economic and environmental conditions is only possible with the contribution of green skill development (Gull et al., 2023). The GSD refers to the process of equipping employees with the knowledge, technical competencies, and behavioural attributes required to address environmental challenges and support organisational sustainability (Heong et al., 2016). In turn, GC is the organisation's ability to integrate such skills and resources into its operational and strategic activities, thereby enhancing adaptability towards environmental demands (Doghan, 2024). The studies by Carmeli & Tishler (2006; Dangelico et al., 2017; M. Gull et al., 2024) have demonstrated that GSD equips employees with environmental knowledge and awareness, which enhances the firm's GC by embedding sustainability-oriented practices into core processes. These capabilities alone, however, may not guarantee improved GP without adequate technological support (Olya et al., 2024). Here, STARA acts as a mediating mechanism

that transforms GC into tangible outcomes by enabling predictive analytics, automating eco-friendly processes, and supporting data-driven decision-making (Roscoe et al., 2019; Kraus et al., 2022). Employees with strong green skills are better able to utilise STARA tools for sustainability-related initiatives, thereby achieving higher GP (Singh et al., 2019). This pathway highlights that while human-driven competencies lay the foundation for sustainable practices, the translation into superior performance outcomes is most effective when mediated by advanced technologies like STARA (Ogbeibu et al., 2021).

On the other hand, some researchers have proved in their study that such mediation does not always produce significant results (Sung & Choi, 2018; Oosthuizen, 2019; Zhang et al., 2022; Mhlongo & Dube, 2023) highlight that without a strong organisational culture and leadership commitment, technological solutions often fail to translate green capabilities into actual performance improvements. Thus, the current study proposes the following hypothesis.

H1a: *GSD has a positive impact on GC.*

H1b: *GSD has a positive impact on STARA.*

H1c: *GSD has a positive impact on GP.*

2.2. Green Motivation (GM), Green Capability (GC), STARA and Green Performance (GP)

According to Junsheng et al. (2020), green motivation is the principal driver of creativity in employees. Green motivation is the risk-taking behaviour, commitment and willingness of employees to drive themselves towards attaining green objectives of the organisation (Chaudhary, 2020; Carballo-Penela et al., 2023). Green motivation stimulates employees to engage in green initiatives, which strengthens the green capabilities of the organisations (Li et al., 2020). Many studies have proved in their research that in the current market situation, where sustainability is playing a vital role organisation that is using STARA is getting a competitive edge as being the most technologically innovative (Brougham & Haar, 2018; Rudolf M. Oosthuizen, 2019; Nhat Tan Pham et al., 2019; Liaquat et al., 2024). According to Muisyo & Qin

(2021), businesses can integrate green performance into their actions and adapt to changing conditions through green capabilities. Such green capabilities enable organisations to tackle and sense upcoming sustainability challenges and take advantage of opportunities for more eco-friendly practices (Kim et al., 2019). Through the incorporation of STARA, organisations can effectively motivate employees, which results in enhanced operational efficacy and commitment towards environmental sustainability (Margherita & Braccini, 2023). This approach helps organisations to sustain a competitive edge in the market. Thus, we propose the following hypothesis:

H2a: *GM has a positive impact on GC.*

H2b: *GM has a positive impact on STARA.*

H2c: *GM has a positive impact on GP.*

2.3. Green Involvement (GI), Green Capability (GC), STARA and Green Performance (GP)

Green involvement is the active contribution of employees in promoting and integrating sustainability within the organisation (Dumont et al., 2017). GI is very important for sustainable development as it helps organisations to perform sustainably (Paillé et al., 2014). It summarises the opportunities provided for employees to gain knowledge about green strategies and to successfully apply them to solve environmental problems. There is a substantial body of literature that supports that the firm's innovative nature affects its performance (Ryoo & Koo, 2013; Nisar et al., 2022; Patwary et al., 2023; Serrano-García et al., 2023). When employees are actively involved, organisations are better positioned to build green capabilities that integrate sustainability into their operations and strategies (Singh et al., 2022). However, translating these capabilities into measurable green performance outcomes often requires technological support. In this regard, STARA has been shown to mediate the GC and GP relationship by automating processes, improving environmental monitoring, and enabling data-driven decision-making (Hughes et al., 2021). Recent studies further demonstrate that the combination of GI and digital technologies enhances eco-innovation, carbon efficiency, and sustainability

reporting (Tsou & Hsu, 2015; Bai & Sarkis, 2017; N. Singh, 2018; Yadegaridehkordi et al., 2020). Nevertheless, researchers' over-reliance on AI can diminish human autonomy and engagement (Dumont et al., 2017). These findings of the studies suggest that although GI, GC, STARA and GP pathways hold strong potential, their effectiveness is contingent upon contextual and organisational factors.

H3a: *GI has a positive impact on GC.*

H3b: *GI has a positive impact on STARA.*

H3c: *GI has a positive impact on GP.*

2.4. Green Empowerment (GE), Green Capability (GC), STARA and Green Performance (GP)

Green empowerment plays an important role in shaping an organisation's overall performance and its green capability (Longoni et al., 2018; Adi et al., 2021). It permits employees to take green initiatives such as developing products and services by following an eco-friendly procedure, which directly impacts firms' green performance (Hutomo et al., 2020). Studies suggest that this empowerment becomes more effective when supported by advanced technologies such as STARA, which can amplify the impact of employee-driven initiatives by enabling automation, predictive analytics, and efficient monitoring of environmental outcomes (Mack & Landau, 2015; Fernandes et al., 2021; Setyaningrum et al., 2023). Empirical evidence demonstrates that combining GE with technological enablers enhances eco-innovation, energy efficiency, and sustainability reporting, which thereby improves green performance (Gali et al., 2020; Xie & Zhu, 2020). Adi et al. (2021) also mentioned in their study that employee involvement and empowerment are essential for translating environmental policies into measurable GP, particularly when mediated by technology. Collectively, these studies strongly support the idea that GE enhances GC and, when coupled with STARA, leads to significant improvements in GP.

H4a: *GP has a positive impact on GC.*

H4b: *GP has a positive impact on STARA.*

H5c: *GP has a positive impact on GP.*

2.5. Green Capability (GC) and Green Performance (GP)

Green capability can directly or indirectly affect green performance (Chang, 2018). Empirical studies confirm that GC directly contributes to Green Performance through eco-innovation, waste minimisation, and energy efficiency (Dangelico et al., 2017; Wang et al., 2020; Rahman et al., 2023). Irfan et al. (2019) showed that firms with strong GC achieved measurable improvements in carbon reduction and resource optimisation. Similarly, Ogbeibu et al. (2024) found that GC fosters proactive environmental strategies, which improve regulatory compliance and stakeholder satisfaction. GC thus acts as a foundation for translating green initiatives into tangible GP outcomes. (P. K. Muisyo & Qin, 2021) further suggest that the development of absorptive and information-sharing capacities empowers team leaders and improves group productivity. Similarly, emphasise the positive role of technology adoption and green production capabilities in improving performance outcomes. Khaskhely et al. (2022) demonstrated that green HRM practices and dynamic sustainable capabilities significantly strengthen corporate sustainability performance, particularly across environmental and social dimensions. Gull et al. (2023) also highlight that top management commitment, adaptable organisational culture, and green product innovation considerably boost green performance. From a service-oriented perspective, Chen et al. (2015) identified that green service innovation, coupled with dynamic and absorptive capacities, contributes to long-term corporate success. Hence:

H5: *GC has a positive impact on GP.*

2.6. STARA as a mediator between Green Capability (GC) and Green Performance (GP)

Prior studies highlight that while GC strengthens organisational sustainability strategies, its impact on GP often depends on technological integration (Kim et al., 2019; Li et al., 2020; Paul Kivinda Muisyo & Qin, 2021; Khaskhely et al., 2022). Evidence suggests that smart technologies, artificial intelligence, robotics, and algorithms enhance firms'

ability to convert GC into measurable GP (Margherita & Braccini, 2021). Shankar et al. (2023) confirmed that AI mediates the relationship between capabilities and performance by facilitating eco-innovation and sustainable decision-making. Similarly, Majid (2022) found that technological adoption bridges the gap between sustainability capabilities and environmental outcomes through efficiency improvements and resource optimisation.

Recent empirical findings also support the mediating effect of STARA in enhancing the GC-GP pathway. Borah et al. (2025) revealed that dynamic capabilities combined with smart technologies significantly improve eco-innovation performance. (Margherita & Braccini, 2021) further observed that digital tools foster employee engagement in green practices, amplifying the effect of GC on GP. Gazi et al. (2025) stressed that digital transformation is a crucial mechanism that strengthens sustainability performance by operationalising organisational capabilities. Hence:

H6: *STARA positively mediates between GC and GP.*

3. Research Methods

3.1. Data Collection

A quantitative approach was employed to gather data from 257 respondents using a seven-point Likert scale. A structured questionnaire was designed to collect the data from working employees across organisations in India.

3.2. Measures

The factor GHRM was a combination of four sub-constructs: Green Skill Development (GSD), Green Involvement (GI), Green Motivation (GM) and Green Empowerment (GE). All these factors were adopted from some well-researched studies, Renwick et al. (2013), Jabbour et al. (2015), Mack & Landau (2015), Pinzone et al. (2016), Dumont et al. (2017), Masri and Jaaron (2017), Tang et al. (2018), Pham et al. (2020c) and Gull et al. (2023). GSD includes GHR practices such as sustainable hiring, candidate selection, employee learning and development. The construct GM includes a recognition and reward system to encourage green behaviour of employees. Whereas the construct GI

promotes employee participation in environmental programs. GE, on the other hand, supports employee-driven ideas for sustainability improvement across organisations. GC, STARA and GP were measured by seven items, four items and three items, respectively, from Pavlou & El Sawy (2011), Ogbeibu et al. (2022) and Zhu et al. (2008). All the constructs were measured on a seven-point Likert scale ranging from strongly disagree to strongly agree to evaluate each item.

4. Analysis

4.1. Assessment of Measurement Model

The research used Smart PLS for data analysis. The measurement model assessment of all the constructs was estimated as per the guidelines provided by Hair et al. (2021) and Henseler et al. (2016). The reliability and convergent validity of all the reflective constructs were examined, which requires that the factor loading of each item should exceed 0.70 to assess composite reliability to measure internal consistency, while Cronbach alpha values should range from 0 to 1, and AVE should be greater than 0.5 (Ali et al., 2018; Hair et al., 2021). The factor loadings of two items were less than the threshold value, but retained as per their AVE scores. (Hair et al., 2021; Sarstedt et al., 2019). The results of the measurement model are presented in Table 2, confirming that all the variables meet their set threshold value. A diverse range of approaches can be adopted to estimate discriminant validity, but most of the research has employed the Heterotrait-monotrait (HTMT) ratio and the Fornell-Larcker test extensively. (Budak & Soyer, 2025; Wani & Ganaie, 2024). Some research suggested two distinct cutoffs of the HTMT ratio, 0.85 or 0.90. The current study has employed the threshold value of 0.85 to measure discriminant validity, as the values were found to be much lower than the set threshold value (Henseler et al., 2016). The square root of the AVE of each construct is analysed using the Fornell-Larcker test, which should be more than the correlation with any other construct. (Rasoolimanesh, n.d.). As can be seen from Tables 3 and 4, the measurement model exhibits satisfactory discriminant validity.

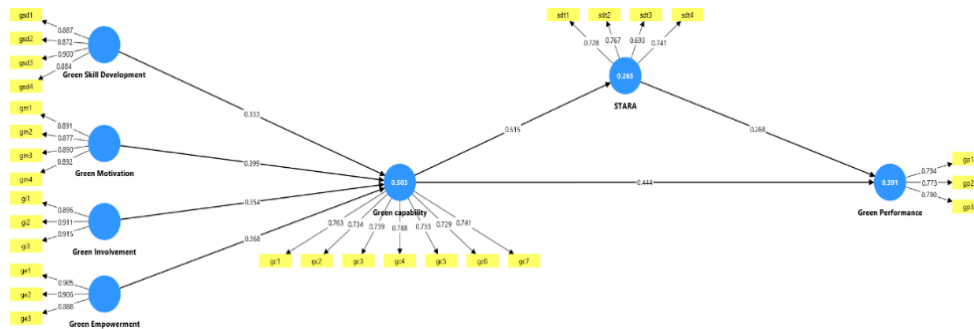


Figure 2: Measurement Model

Table 2: Measurement Model- Construct Reliability and Validity

Constructs	Items	Factor Loading	Cronbach Alpha	Composite Reliability	AVE
Green Skill Development	GSD 1	0.887	0.909	0.920	0.785
	GDS2	0.872			
	GSD3	0.900			
	GSD4	0.884			
Green Motivation	GM1	0.891	0.910	0.913	0.787
	GM2	0.877			
	GM3	0.890			
	GM4	0.892			
Green Involvement	GI1	0.896	0.893	0.895	0.824
	GI2	0.911			
	GI3	0.915			
Green Empowerment	GE1	0.905	0.883	0.890	0.809
	GE2	0.906			
	GE3	0.888			
Green Capability	GC1	0.763	0.868	0.868	0.558
	GC2	0.734			
	GC3	0.739			
	GC4	0.788			
	GC5	0.733			
	GC6	0.729			
	GC7	0.741			
STARA	SDT1	0.728	0.712	0.715	0.537
	SDT2	0.767			
	SDT3	0.693			
	SDT4	0.741			
Green performance	GP1	0.794	0.691	0.692	0.617
	GP2	0.773			
	GP3	0.790			

Table 3: Discriminant Validity (HTMT Ratio)

HTMT	Green Empowerment	Green Involvement	Green Motivation	Green Performance	Green Skill Development	Green capability	STARA
Green Empowerment							
Green Involvement	0.050						
Green Motivation	0.091	0.043					
Green Performance	0.327	0.409	0.237				

Green Skill Development	0.081	0.051	0.172	0.296			
Green capability	0.425	0.398	0.431	0.750	0.293		
STARA	0.326	0.334	0.227	0.701	0.254	0.655	

Table 4: Discriminant Validity (Fornell–Larcker criterion)

	Green Empowerment	Green Involvement	Green Motivation	Green Performance	Green Skill Development	Green capability	STARA
Green Empowerment	0.900						
Green Involvement	-0.035	0.908					
Green Motivation	0.079	0.017	0.887				
Green Performance	0.257	0.324	0.189	0.786			
Green Skill Development	-0.037	0.011	-0.150	0.236	0.886		
Green capability	0.375	0.351	0.384	0.581	0.264	0.747	
STARA	0.263	0.268	0.184	0.496	0.205	0.515	0.733

To estimate the multicollinearity of composite constructs, VIF values were found to be close to their maximum limit of 3.33 (Hair et al., 2019). Also, the values of outer weights should be substantial to determine the acceptance of the measurement model of composite constructs of the current study.

(Daoud, 2017; Hair et al., 2019; Rasoolimanesh, n.d.). The results of VIF values were mentioned in Table 5, specifying that the values ranged from 1.000 to 1.360, and outer weights were significant, which supports that the measurement model is acceptable.

Table 5: VIF Values

	Green Empowerment	Green Involvement	Green Motivation	Green Performance	Green Skill Development	Green capability	STARA
Green Empowerment						1.008	
Green Involvement						1.002	
Green Motivation						1.029	
Green Performance							
Green Skill Development						1.024	
Green capability				1.360			1.000
STARA				1.360			

4.2. Assessment of Structural Model

The reliability and validity of the relationships have already been tested along with path analysis to examine the association between all the latent

variables and the structural model. Figure 2 and Table 2 display the path coefficients and factor loadings under the set threshold limits. The projected model meaningfully explains the adoption ($R^2 = 0.391$) and actual usage ($R^2 = 0.386$).

The results of direct and indirect routes of the structural model are depicted in Figure 2, Table 6 and Table 7. The researchers set out the statistical significance at 95% confidence intervals and p values < 0.05. In terms of direct routes, GSD positively and substantially affects GC, STARA and GP ($\beta= 0.329, p <0.05$), ($\beta= 0.170, p <0.05$) and ($\beta= 0.192, p <0.05$), which supports H1a, H1b and H1c. The results of the study show that GM substantially impacts GC, STARA and GP ($\beta= 0.397, p <0.05$), ($\beta= 0.205, p <0.05$) and ($\beta= 0.231, p <0.05$). Therefore, H2a, H2b, H2c are supported. The study confirms that GI also had a sizable favourable impact on GC, STARA and GP ($\beta= 0.350, p <0.05$), ($\beta= 0.180, p <0.05$) and ($\beta= 0.204, p <0.05$). Therefore, H3a, H3b and H3c are accepted. The results indicate that GE has a considerable effect on GC, STARA and GP ($\beta= 0.368, p <0.05$), ($\beta= 0.190, p <0.05$) and ($\beta= 0.214, p <0.05$). Therefore, H4a, H4b and H4c are supported. The researchers, through the results of the study, discovered that GC positively affects GP of an organisation ($\beta= 0.445, p <0.05$), which supports H5.

In terms of indirect and mediating effects (Table 7), it has been discovered through results that STARA positively mediates the relationship between GC and GP ($\beta= 0.137, p <0.05$). Therefore, H6 is supported. The results of indirect effects also supported that GC played a significant role in the relationship between GSD and STARA ($\beta= 0.170, p <0.05$), GE and STARA ($\beta= 0.190, p <0.05$), GM and STARA ($\beta= 0.205, p <0.05$) and GI and STARA ($\beta= 0.180, p <0.05$). The results also accepted that GC positive role in the relationship between GM and GP ($\beta= 0.177, p <0.05$), GE and GP ($\beta= 0.165, p <0.05$), GSD and GP ($\beta= 0.146, p <0.05$), GI and GP ($\beta= 0.156, p <0.05$). The researcher also tested the combined indirect effects of GC and STARA. The results positively supported the effect of GC and STARA on the relationship between GI and GP ($\beta= 0.048, p <0.05$), GSD and GP ($\beta= 0.045, p <0.05$), GM and GP ($\beta= 0.054, p <0.05$), GE and GP ($\beta= 0.051, p >0.05$).

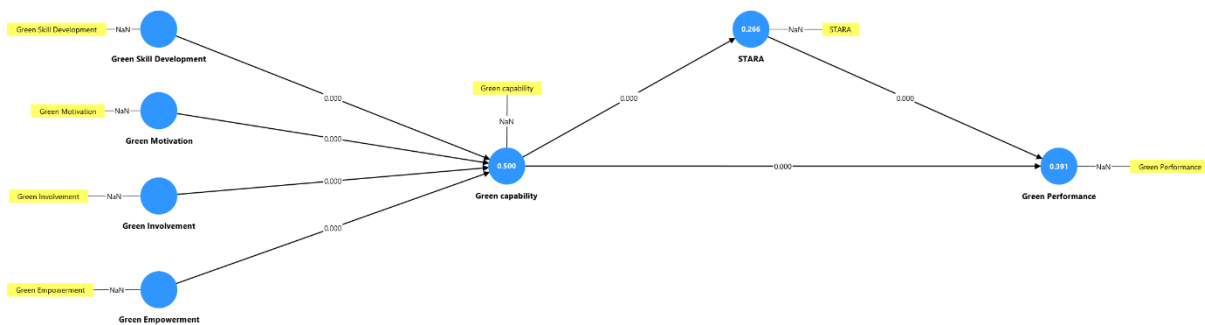


Figure 3: Structural Model

Table 6: Structural Model Assessment

Criterion Variable	Predictor Variable	Direct Relationship and Hypothesis	Beta	Significance
Green Capability	Green Skill Development	Green Skill Development → Green Capability, H1a	0.329	Yes
STARA	Green Skill Development	Green Skill Development → STARA, H1b	0.170	Yes
Green performance	Green Skill Development	Green Skill Development → Green Performance, H1c	0.192	Yes
Green Capability	Green Motivation	Green Motivation → Green Capability, H2a	0.397	Yes
STARA	Green Motivation	Green Motivation → STARA, H2b	0.205	Yes
Green Performance	Green Motivation	Green Motivation → Green Performance, H2c	0.231	Yes
Green Capability	Green Involvement	Green Involvement → Green Capability, H3a	0.350	Yes

STARA	Green Involvement	Green Involvement → STARA, H3b	0.180	Yes
Green Performance	Green Involvement	Green Involvement → Green Performance, H3c	0.204	Yes
Green Capability	Green Empowerment	Green Empowerment → Green Capability, H4a	0.368	Yes
STARA	Green Empowerment	Green Empowerment → STARA, H4b	0.190	Yes
Green Performance	Green Empowerment	Green Empowerment → Green Performance, H4c	0.214	Yes
Green Performance	Green Capability	Green Capability → Green Performance, H5	0.445	Yes

Table 7: Indirect Effects

Indirect Relationship	Beta Value	Significance
Through Green Capability		
Green Empowerment → STARA	0.190	0.00
Green Involvement → STARA	0.180	0.00
Green Skill Development → Green performance	0.146	0.00
Green Motivation → STARA	0.205	0.00
Green Skill Development → STARA	0.170	0.00
Green Empowerment → Green Performance	0.164	0.00
Green Involvement → Green performance	0.156	0.00
Green Motivation → Green Performance	0.177	0.00
Through Green Capability and STARA		
Green Involvement → Green Performance	0.048	0.00
Green Empowerment → Green Performance	0.051	0.00
Green Motivation → Green Performance	0.054	0.00
Green Skill Development → Green Performance	0.045	0.00
Through STARA		
Green Capability → Green Performance, H6	0.137	0.00

5. Discussion

The present study seeks to explore the integrated framework of GHRM practices, encompassing green skill development, green motivation, green involvement, and green empowerment, and their collective influence on green capability. Furthermore, it examines the mediating and moderating roles of STARA in strengthening the linkage between green capability and green performance. In doing so, the study aims to advance understanding of how green-oriented HR practices and technological readiness synergistically contribute to enhancing organisational environmental sustainability and performance outcomes (Ogbeibu et al., 2022; Doghan, 2024). This research framed a conceptual model through a rigorous review of the literature. Regarding the acceptance of the tested hypothesis, the results revealed a favourable and positive impact of GSD, GE, GI, GM and GC through STARA on GP, which are consistent with the results of several earlier studies, such as Ren & Wu (2022), Ogbeibu et al.

(2022), Li et al. (2024), and Doghan (2024). The studies have discovered the impact of GSD on GC and GP under different scenarios. GSD enhances employees’ environmental knowledge and technical competencies, which strengthens GC and leads to improved Green Performance GP. Training in green practices equips employees to innovate and implement sustainable solutions that reduce waste and enhance efficiency. Empirical evidence shows that GSD fosters green innovation and dynamic capabilities, translating into better environmental and organisational outcomes (Chen et al., 2015; Yusoff et al., 2022).

The research also investigated the impact of GM on GC, STARA and GP, which was later found to be significant. The existing literature supports the results of the study, as GM encourages employees to care about environmental goals and take part in eco-friendly activities at work. When employees are motivated to act sustainably, their skills and awareness toward green practices improve, which strengthens the organisation’s GC and leads to better

GP. This relationship becomes stronger through STARA, which helps organisations use smart technologies to support sustainability and improve overall performance (Margherita & Braccini, 2023; Borah et al., 2025).

About the influence of GI on GC, GP and STARA, the results support the impact; also, numerous studies confirmed the effects Paillé et al., 2014; Dumont et al., 2017; Kraus et al., 2020; and Sherpa et al., 2022). They have found out that GI encourages employees to actively engage in environmental decision-making and sustainability initiatives, creating a sense of ownership toward green goals. When employees participate in green projects and eco-friendly operations, their awareness and understanding of sustainable practices increase, strengthening the organisation's GC and leading to improved GP. The role of STARA further enhances this relationship by helping organisations automate sustainability practices, optimise resource use, and make data-driven environmental decisions.

GE is the ultimate component of green HRM, and has been showcased as one of the significant predictors of GC and GP by many researchers, including Pham et al. (2019), Roscoe et al. (2019), and Borah et al. (2025). The results of the studies imply that GE enables employees to make autonomous decisions and take proactive action toward environmental goals, fostering a sense of responsibility and ownership in achieving sustainability. Empowered employees are more likely to share innovative ideas, adopt green initiatives, and contribute to building a strong GC, which enhances GP. The integration of STARA strengthens this link by streamlining sustainability operations, improving data accuracy, and enabling efficient green decision-making.

Regarding the mediation effect of STARA, the study revealed that STARA positively mediates the relationship between GC and GP. The results suggest that STARA enhances GC by enabling data-driven decisions, automating green operations, and optimising resource use, thereby improving GP. Studies indicate that organisations integrating STARA can translate their green knowledge into tangible sustainability outcomes more effectively,

enhancing innovation, efficiency, and environmental performance (Ogbeibu et al., 2024; Doghan, 2024; Xiao & Xiao, 2025).

6. Conclusion

In the evolving landscape of green practices and sustainability initiatives across organisations, the findings or research suggest that STARA implementation in green HRM practices plays a pivotal role in enhancing the green performance of the organisations. Employees can be facilitated with skill development that fosters their interest in participating proactively in sustainability initiatives. Along with the technology organisation can adapt the allocation of resources and practices to enable more employee-driven green and sustainable initiatives. The outcomes of the research underscore the transformative potential of STARA; moreover, it creates a conducive environment for organisations to understand and explore additional technology potentials to achieve the green performance benchmarks. The quantitative data demonstrates green human resource management practices, green skill development (GSD), green motivation (GM), green involvement (GI), green empowerment (GE), and green capability (GC) have a positive impact on the organisation's green performance and have a positive relationship. In conclusion, the study highlights the potential of STARA technology in fostering green HRM practices, leading towards better green performances of the organisations.

7. Future Scope and Limitations

The study has specific limitations, as the data were collected from working employees across different organisations in India, and does not restrict to a specific industry such as Service, Manufacturing, Information Technology, FMCG, etc. The study used a structured questionnaire, which was limited to green HRM, STARA, and Green performance factors. And limited to quantitative methods.

In future longitudinal research should be conducted to gain more clarity, and further, the research could be focused on specific industries and sectors to gain more insights across diverse sectors. Also, qualitative methods can be adopted to understand sentiments and themes across the concerns and

challenges in the adoption of technologies for implementing green HRM practices.

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