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Fostering Employee Engagement through Green HRM Practices: A Study of IT Professionals in Bangalore

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Abstract

Green HRM has emerged as a strategic approach for fostering sustainability while enhancing organizational effectiveness. This study investigates the relationship between Green HRM practices and employee engagement among IT professionals in Bangalore. Employing a mixed-method approach, the research involved 284 IT employees and utilized Structural Equation Modeling (SEM) to analyze the data. Results reveal that environmental awareness programs, employee involvement in green initiatives, green training and development, green communication strategies, and green rewards and compensation significantly enhance employee engagement. Practical implications include actionable recommendations for organizations to integrate Green HRM practices to achieve dual goals of sustainability and workforce engagement.

Keywords: engagement, HRM, involvement, significantly

Introduction

Sustainability has become a pivotal aspect of modern organizational strategies, particularly in sectors such as IT, which are characterized by rapid innovation and environmental challenges. Green Human Resource Management (Green HRM) represents a paradigm shift in HR practices, integrating environmental management with human resource policies to foster sustainability and engage employees effectively. Employee engagement, a critical determinant of organizational success, can be significantly influenced by the adoption of Green HRM practices. This study explores this relationship, focusing on IT professionals in Bangalore, a hub for technology and innovation.

Literature Review

Green Human Resource Management (GHRM) has gained prominence in recent years as a strategic approach to integrating environmental sustainability with human resource practices, thereby aligning organizational goals with employee welfare and engagement. The increasing focus on sustainability in corporate strategies has brought GHRM to the forefront as a means to foster environmentally responsible behavior within organizations. Key practices under GHRM highlight its multifaceted role in achieving organizational sustainability while promoting employee engagement and well-being.

One critical area of GHRM is the integration of environmental awareness programs designed to enhance employees' understanding of sustainability issues. These programs educate employees about the importance of reducing carbon footprints, conserving resources, and supporting sustainable business practices. Recent studies, such as those by Sharma et al. (2023) and Gupta & Verma (2022), emphasize that such initiatives cultivate a culture of environmental responsibility and encourage employees to adopt green practices both at work and in their personal lives.

Employee involvement in eco-friendly initiatives has also been recognized as a vital driver of organizational green performance. According to Kumar et al. (2021), engaging employees in sustainability-related decision-making

processes and activities—such as waste reduction campaigns, energy-saving initiatives, and environmental audits—fosters a sense of ownership and commitment. This active participation not only boosts organizational green outcomes but also enhances employee satisfaction by providing meaningful opportunities for contribution.
Green training and development programs play a significant role in equipping employees with the necessary skills and knowledge to implement sustainable practices. Rahman & Afsar (2020) highlight that such training programs enable employees to adopt innovative methods for resource efficiency, waste management, and energy conservation. Moreover, training fosters a mindset shift toward sustainability, which can influence broader organizational culture.
Effective green communication strategies have emerged as a cornerstone of successful GHRM. As Singh et al. (2019) suggest, transparent and consistent communication about sustainability goals and initiatives builds trust and reinforces the organization's commitment to environmental responsibility. Communication channels, including newsletters, workshops, and digital platforms, help ensure that employees are informed and motivated to participate in green activities.
Incentivizing eco-friendly behavior through green rewards and compensations is another key component of GHRM. Ahmad et al. (2018) report that recognizing and rewarding employees for their contributions to sustainability initiatives enhances motivation and engagement. Incentives such as bonuses, promotions, and public recognition linked to environmental performance create a positive feedback loop, encouraging employees to sustain their efforts.
Collectively, these practices align with foundational studies by Renwick et al. (2013) and Jabbour & Santos (2008), which underline the strategic importance of GHRM in embedding sustainability into organizational frameworks. These studies demonstrate that GHRM not only drives environmental performance but also positively influences employee morale, job satisfaction, and overall engagement. By integrating environmental goals with HR practices, organizations can create a culture of sustainability that benefits both the planet and their workforce.

Objective

1. Identify the Green HRM practices adopted by IT organizations in Bangalore.
2. Assess the relationship between specific Green HRM practices and employee engagement.
3. Provide actionable recommendations for enhancing employee engagement through Green HRM practices.

Hypotheses

The study proposes the following hypotheses:

- **H1**: Environmental awareness programs positively influence employee engagement.
- **H2**: Employee involvement in green initiatives positively impacts employee engagement.
- **H3**: Green training and development programs significantly enhance employee engagement.
- **H4**: Green communication strategies positively affect employee engagement.
- **H5**: Green rewards and compensations significantly contribute to employee engagement.

Research Methodology

The study adopts a quantitative research design, utilizing a structured questionnaire to gather data from IT professionals in Bangalore. A total of 300 questionnaires were distributed, yielding 291 responses, of which 284 were finalized after data screening. To ensure a representative sample, stratified random sampling was employed, capturing respondents from various IT organizations. Data analysis involved multiple techniques to explore and validate the dimensions of Green HRM. Exploratory Factor Analysis (EFA) was performed to identify underlying constructs, followed by Confirmatory Factor Analysis (CFA) to validate these constructs.

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Data Analysis and Results

4.1 Demographic Information

Table 1: Demographic Information of Respondents (N=284)

Variable	Frequency	Percentage
Gender	Male: 175	61.6%
	Female: 109	38.4%
Age Group	21-30: 102	35.9%
	31-40: 142	50.0%
	41-50: 40	14.1%
Experience	<5 years: 95	33.5%
	5-10 years: 124	43.7%
	>10 years: 65	22.9%

The demographic profile of the respondents reveals a gender distribution with 61.6% male (175 respondents) and 38.4% female (109 respondents), indicating a higher representation of males among IT professionals surveyed. The age group analysis shows that a significant proportion of respondents fall within the 31-40 age bracket (50.0%), followed by 21-30 years (35.9%), and a smaller percentage in the 41-50 age group (14.1%). In terms of work experience, 43.7% of the participants have 5-10 years of experience, representing the largest category. This is followed by 33.5% with less than 5 years of experience and 22.9% with more than 10 years of experience. The data reflects a diverse yet balanced distribution of respondents across age groups and experience levels, providing a comprehensive basis for analyzing perspectives on Green HRM practices in the IT sector.

4.2 Data Screening

4.2.1 **Missing values**: Out of 300 questionnaires distributed, 291 responses were returned. Missing data for three constructs were addressed by substituting the mean of the respective series. Following the removal of incomplete responses, a total of 284 was finalised for data analysis.

4.2.2 **Normality**: Kurtosis and skewness were used to analyze the collected data for outliers and normality. The research had cited Hair et al. (2010) for the interpretation of reference values. The skewness and kurtosis values from Table 2 are between +2 to -2 which means that the values do not exceed the cutoff threshold. Furthermore, the standard deviations for all the items being greater than 0.5 also confirms that the data are normally distributed.

4.3 Exploratory Factor Analysis

The study conducted EFA for identifying various dimensions of green HRM adopted by IT companies. Before conducting the analysis, the adequacy of the sample was evaluated through the Kaiser-Meyer-Olkin (KMO) test. The KMO statistic was 0.850, exceeding the recommended threshold of 0.60, thereby indicating that the sample was adequate for factor analysis. Five factors were extracted based on the criterion of Eigenvalues exceeding 1, accounting for a total variance of 78.69%, which demonstrates a substantial level of explanatory power.

Table 2: Descriptives, Scale Items and Factor Loadings

	Items	Loadings	Mean	Standard deviations	Skewness	Kurtosis
Environmental Awareness programs	EAP1	.829	3.06	1.033	-.082	-.856
	EAP2	.855	3.08	1.018	-.123	-.828
	EAP3	.862	3.15	1.005	-.132	-.694
Employee Involvement in green initiatives	EIG1	.843	3.45	1.002	-.605	-.066
	EIG2	.860	3.50	1.000	-.544	-.181

	EIG3	.864	3.49	.975	-.696	.328
Green training development	GTD1	.873	3.59	.918	-.534	.224
	GTD2	.837	3.64	.928	-.607	.269
	GTD3	.825	3.61	1.012	-.692	.239
Green Communication strategies	GCR1	.837	2.70	1.069	.446	-.790
	GCR2	.854	2.81	1.138	.459	-.867
	GCR3	.780	2.67	1.027	.513	-.650
Green rewards compensations	GRC1	.827	3.14	.893	-.033	-.483
	GRC2	.791	3.14	.964	-.007	-.639
	GRC3	.837	3.09	.893	-.001	-.575

Source: Primary survey

4.4 Confirmatory factor analysis

Confirmatory Factor Analysis (CFA) systematically evaluated the validity and reliability of the constructs. Composite Reliability (CR) assessed internal consistency, while Average Variance Extracted (AVE) and Maximum Shared Variance (MSV) were utilised to evaluate convergent validity and discriminant validity, respectively. According to Hair et al., (2010), the construct is reliable and valid when CR>0.7, AVE>0.5 and AVE>MSV.

Table 4 demonstrates that all constructs satisfy these requirements and therefore, have reliability and validity. In particular, the values of CR were above 0.7, those of AVE were above 0.5 and those of MSV were all lower than AVE, confirming the adequacy of the scales for the subsequent use SEM. Fornell-Larcker Criterion (1981) was also checked by comparing the square root of AVE (which are in diagonals of the Table 4) were more than the correlations of any two constructs represented the discriminant validity of the measurement.

Additionally, CFA demonstrated a fitted model with NFI and CFI > 0.90, and RMSEA < 0.08, which indicated that the model was adequate for subsequent analyses. This establishes a solid base to SEM, confirming the accuracy and reliability of measurement model.

Figure 1: CFA for IT Employee engagement

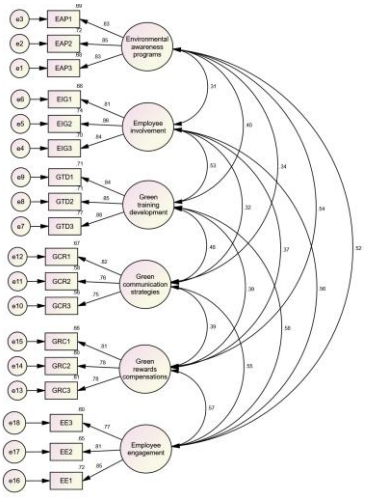


Table 3: Reliability and validity

	CR	AVE	MSV	Green Rewards compensations	Environmental Awareness programs	Employee involvement	Green training development	Green Communication strategies	Employee engagement
Green rewards compensations	0.832	0.622	0.319	0.789					
Environmental Awareness programs	0.873	0.696	0.296	0.544	0.834				
Employee involvement	0.875	0.700	0.319	0.372	0.311	0.837			
Green training development	0.892	0.734	0.333	0.390	0.398	0.534	0.856		
Green communication strategies	0.821	0.605	0.306	0.386	0.338	0.325	0.482	0.778	
Employee engagement	0.852	0.658	0.333	0.565	0.523	0.565	0.577	0.553	0.811

The results of the reliability and validity tests in Table 3 demonstrate the robustness of the constructs used in the study. Composite Reliability (CR) values for all constructs exceed the recommended threshold of 0.70, indicating strong internal consistency. The Average Variance Extracted (AVE) values are above the acceptable threshold of 0.50, confirming convergent validity for all constructs. Maximum Shared Variance (MSV) values are lower than the AVE values for each construct, providing evidence of discriminant validity. Additionally, the square root of AVE (shown along the diagonal) is higher than the correlations between constructs, further supporting discriminant validity. For example, "Green Rewards and Compensations" has a CR of 0.832, AVE of 0.622, and MSV of 0.319, with its square root of AVE (0.789) being higher than its correlations with other constructs.

Table 4: Model fit indices

Indices	**Abbreviation**	**Observed values**	**Recommended criteria**
Normed chi square	$\chi 2/DF$	1.601	$1<\chi 2/df<3$
Goodness-of-fit index	GFI	0.930	>0.90
Normed fit index	NFI	0.936	>0.90
Comparative fit index	CFI	0.975	>0.90
Tucker-Lewis index	TLI	0.968	0<TLI<1
Root mean square error of approximation	RMSEA	0.046	<0.05 good fit <0.08 acceptable fit

The model fit indices in Table 4 confirm that the structural model exhibits an excellent fit with the data. The normed chi-square value ($\chi 2/DF$) is 1.601, falling within the recommended range of 1 to 3. Goodness-of-Fit Index (GFI = 0.930), Normed Fit Index (NFI = 0.936), Comparative Fit Index (CFI = 0.975), and Tucker-Lewis Index (TLI = 0.968) all exceed the threshold of 0.90, indicating a well-fitting model. The Root Mean Square Error of Approximation (RMSEA = 0.046) is below the stringent threshold of 0.05, demonstrating an excellent fit. Collectively, these indices suggest that the hypothesized model provides a reliable representation of the relationships among the constructs.

4.5 Hypothesis testing using SEM:

Structural Equation Modelling (SEM) was employed to evaluate the hypothesized relationships using the maximum likelihood estimation method, a widely accepted technique in empirical research (Bunch, 2013). The hypotheses were assessed based on standardized regression coefficients (β), critical ratio (CR)/T-values, and corresponding p-values. For a hypothesis to be supported, the CR value must exceed 1.96, and the p-value must be less than 0.05, indicating statistical significance at the 5% level. The results of the structural model, as depicted in Figure 2 and summarized in Table 5, reveal significant relationships between employee engagement and the selected Green HRM practices.

The standardized regression coefficient for environmental awareness programs was β = 0.243, with a CR value of 3.922 and a p-value of 0.000. These results indicate that environmental awareness programs have a significant positive impact on employee engagement, as p values less than 0.05, supporting H1.

Similarly results confirmed positive and significant impact of employee involvement in green initiatives on employee engagement. The β value for this path is = 0.333, with a CR =5.269 and p=0.000. This highlights a strong positive relationship between employee involvement in green initiatives and employee engagement, leading to the acceptance of H2.

The influence of green HRM practices such as green training and development (β = 0.249, CR= 4.071, and p =0.000), and green communication strategies (β = 0.309, CR= 4.673, and p =0.000) on employee engagement were positive and significant. Since the p value for these paths less than 0.05, thus hypotheses H3 & H4 were accepted respectively.

Finally, green rewards and compensation (β = 0.280, CR= 4.337, p=0.000) were also found to significantly influence employee engagement. Thus, H5 is supported.

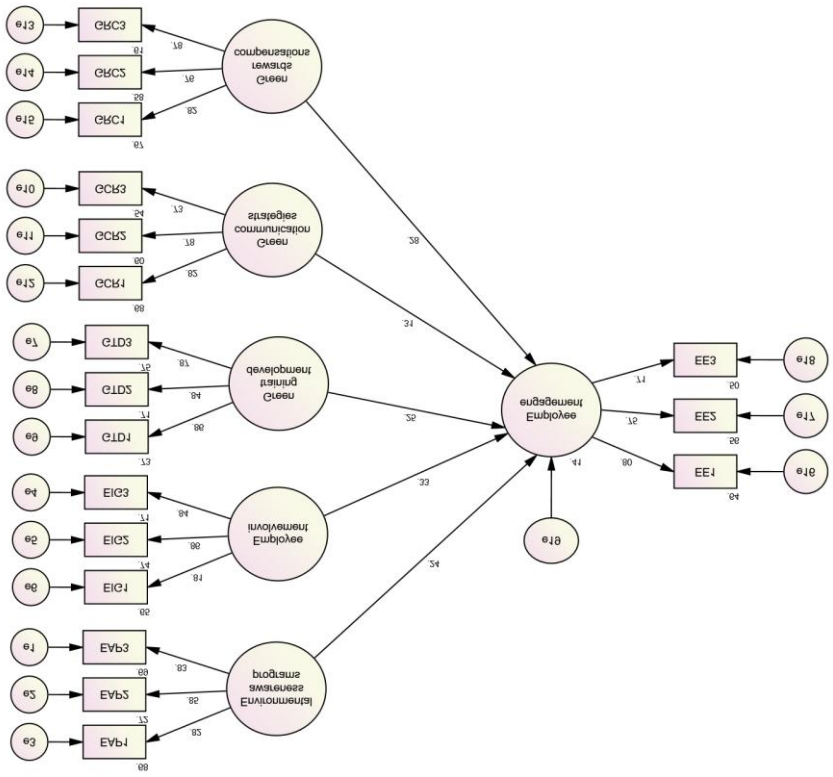
The coefficient of determination (**R^2**) for the structural model was **0.406**, indicating that 40.6% of the variance in employee engagement is explained by the combined effect of environmental awareness programs, employee involvement in green initiatives, green training and development, green communication strategies, and green rewards and compensation.

Table 5: Hypothesis testing results:

Outcome variable		Independent variables	Standardized regression weights (β)	S.E.	C.R./T	P	Result
Employee engagement	<---	Environmental Awareness programs	0.243	.041	3.922	0.000	H1 supported
Employee engagement	<---	Employee Involvement in green initiatives	0.333	.042	5.269	0.000	H2 supported
Employee engagement	<---	Green training development	0.249	.038	4.071	0.000	H3 supported

Employee engagement	<---	Green Communication strategies	0.309	.048	4.673	0.000	H4 supported
Employee engagement	<---	Green rewards compensations	0.280	.050	4.337	0.000	H5 supported

Figure 2: Employee Engagement casual model



5. Discussion

The findings of this study provide valuable insights into the determinants of employee retention in the IT sector, emphasizing the roles of **flexible working hours, job autonomy, and organizational support**.

Flexible working hours significantly enhance employee retention by facilitating a better work-life balance. IT professionals, who often contend with irregular schedules due to global operations and client demands, benefit from flexibility as it reduces stress and improves job satisfaction. This aligns with Narayanan et al. (2019), who found that flexible policies positively influence retention by addressing employees' personal and professional needs.

Job autonomy was found to be a crucial factor in retaining IT employees. Autonomy enables professionals to exercise control over their tasks, fostering intrinsic motivation and job satisfaction. These results resonate with the findings of Hackman and Oldham (1980), who highlighted that job autonomy is a key driver of employee engagement and retention. Babalola et al. (2020) also reported similar outcomes in knowledge-intensive industries, where autonomy allows employees to thrive in dynamic environments.

The study underscores the pivotal role of organizational support in retention. A supportive work environment, characterized by access to resources, constructive feedback, and recognition, strengthens employees' emotional connection with the organization. This is consistent with the work of Eisenberger et al. (1986), who introduced

the concept of perceived organizational support, and Ahmad et al. (2021), who demonstrated its significant impact on reducing turnover in the IT sector.

5.2 Practical Implications

The findings of this study offer actionable strategies for IT organizations to enhance employee engagement through Green HRM practices:

IT organizations should invest in consistent and impactful environmental awareness initiatives. Workshops, campaigns, and gamified programs can educate employees on sustainability goals while creating a shared sense of purpose and alignment with organizational values.

Encouraging employees to participate in green projects such as recycling drives, energy-saving initiatives, or sustainability committees can foster a sense of ownership and pride. Employee-driven green initiatives not only boost engagement but also create a more environmentally conscious workforce.

Tailoring training programs to include sustainability-focused skills and knowledge equips employees to align their work with the organization's environmental goals. These programs should be ongoing, with measurable outcomes to ensure they are effective in enhancing engagement.

Transparent and continuous communication about sustainability goals and achievements can instill trust and motivate employees. Using digital tools such as intranet platforms, newsletters, or dashboards to share green progress fosters a culture of inclusion and collaboration.

Recognizing and rewarding employees' contributions to environmental goals, whether through monetary incentives, recognition programs, or career growth opportunities, can reinforce sustainable behavior and improve engagement.

5.3 Theoretical Contributions

This study contributes to the literature on Green HRM by establishing a link between green practices and employee engagement. It integrates environmental awareness programs, employee involvement, and green-specific HRM strategies into the broader framework of employee engagement. The findings align with Social Exchange Theory (SET), which posits that reciprocal relationships between employees and organizations enhance engagement. By prioritizing sustainability, organizations create an environment where employees feel valued, thus fostering higher engagement levels.

6. Conclusion and Future Research Scope

This paper highlights the significant impact of Green HRM practices on employee engagement in IT organizations. The findings demonstrate that all the examined practices—environmental awareness programs, employee involvement, green training, communication strategies, and rewards—play a critical role in fostering engagement. Among these, employee involvement and green communication strategies exhibit the strongest influence.

Future research can explore additional variables, such as employees' pro-environmental behaviors and job satisfaction, as mediators or moderators between Green HRM practices and engagement. Demographic factors, such as age and cultural background, could offer insights into tailoring Green HRM initiatives for diverse workforces. Longitudinal studies can provide deeper insights into the sustained impact of Green HRM on engagement over time. Furthermore, cross-industry studies could identify sector-specific practices, and the role of emerging technologies like AI and blockchain in enhancing Green HRM strategies warrants further investigation.

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Annexure

Table A:

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
1	5.665	37.768	37.768	5.665	37.768	37.768
2	2.008	13.385	51.153	2.008	13.385	51.153
3	1.670	11.136	62.289	1.670	11.136	62.289
4	1.320	8.802	71.091	1.320	8.802	71.091
5	1.140	7.602	78.693	1.140	7.602	78.693
6	.447	2.978	81.671			
7	.415	2.764	84.435			
8	.386	2.577	87.012			
9	.352	2.346	89.358			
10	.331	2.204	91.562			
11	.295	1.970	93.532			
12	.276	1.843	95.375			
13	.264	1.757	97.132			
14	.227	1.511	98.644			
15	.203	1.356	100.000			

Extraction Method: Principal Component Analysis.