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How Green Performance Appraisal Drives Environmental Performance: The Mediating Role of Employee Productivity

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Abstract: The purpose of this research was to evaluate how Green Performance Management and Appraisal affects overall employee satisfaction, productivity & environmental impacts within the service sector. This study used an overall quantitative approach with a cross-sectional design to collect primary data from 584 service sector workers located in Tamil Nadu India via a structured questionnaire. Structural Equation Model (SEM) analyses were conducted to confirm the hypothesized relationships between GPMA, employee satisfaction, productivity, as well as environmental performance. The results suggest that employees who are rated by their organisations using GPMA have higher levels of job satisfaction as well as improved productivity levels when compared to other employees. While GPMA shows a significant relationship with employee satisfaction and environmental performance, it has a significant relationship with Perceived Employee Productivity and therefore it may be viewed as a type of no mediating effect. It appears that GPMA has a greater impact on environmental performance through Perceived Employee Productivity rather than employee satisfaction. This study provides important theoretical and practical implications by showing how green appraisal systems can be used strategically to advance sustainability goals. The findings of this research encourage organisations to include productivity based green performance measurements in their human resource management systems to enhance environmental performance within service organisations.

Keywords: Sustainable HRM, SDG, GHRM, Green Recruitment & Selection, Green Training & Development, Green Compensation & Reward.

1. Introduction

Service-based organisations are increasingly required to adopt sustainable, environmentally responsible practices (Tanova & Bayighomog, 2022). Labour-intensive service sectors such as hospitality, banking, healthcare and tourism contribute substantially to the economy but also impose significant environmental impacts through resource use, waste generation and consumer exposure to sustainable practices (Bibi *et al.,* 2025; Raut *et al.*, 2020; Jerónimo *et al.,* 2025; Khan *et al.,* 2022; Karmaoui *et al.,* 2024). In response, many service organisations are integrating environmental considerations into core HRM through Green Human Resource Management (GHRM) and, specifically, Green Performance Management and Appraisal (GPMA), to shape employee behaviours that support organisational sustainability and employee outcomes (AlKetbi & Rice, 2024; Fernandez & Ganesan, 2023; Rubel *et al.,* 2021).

GHRM is increasingly viewed as a strategic tool for sustainable development, yet its impacts on job satisfaction, Perceived Employee Productivity and environmental performance in service settings remain under-examined. Existing research shows that GHRM practices are positively related to environmental outcomes and to employee behaviours aligned with sustainability, especially when recruitment, selection and appraisal criteria incorporate environmental responsibility (Hwang *et al.,* 2019). Studies also indicate that such practices enhance job satisfaction by providing meaningful engagement in environmentally friendly activities and signalling organisational support for sustainability.

In the service sector, green HR practices have been found to improve both environmental outcomes and employees' psychological states. Evidence from healthcare and hospitality shows that green performance management and compensation can mediate the effects of GHRM on sustainable performance, highlighting the importance of green performance appraisal in service organisations (Abdelhamied et al., 2023). Because services depend heavily on human resources and often have limited control over physical production conditions, integrating green criteria into performance appraisals helps employees understand and apply appropriate environmental practices (Ly & Ly, 2024).

Empirical work further suggests that GHRM practices increase employee satisfaction, which can enhance performance and engagement (Bresciani *et al.,* 2023). In service contexts characterised by intensive customer interaction, satisfied employees tend to deliver higher-quality service and employ sustainable practices when dealing with customers and other stakeholders (Xie *et al.,* 2023). Environmentally responsible appraisal systems can provide employees with meaningful feedback about their contributions, strengthening self-motivation, while HR practices that promote engagement and environmental responsibility also support productivity (Martins *et al.,* 2021). Green Performance Management extends traditional HR processes beyond efficiency to include sustainable performance, equipping employees with motivation and tools to embed ecological considerations into everyday work (Onubi et al., 2024). Recent evidence on green performance indicators shows that employees become more productive when their performance is tracked against green metrics, which increases motivation to use resources efficiently and reinforces organisational sustainability values (Jimoh *et al.,* 2025). However, the literature still lacks a clear understanding of how GPMA directly and indirectly influences service productivity, particularly within SEM-based models that capture the complexity of these relationships (Rehman Khan & Yu, 2020).

Although GHRM benefits employees and organisations, empirical evidence directly linking GPMA with job satisfaction and productivity among service-sector employees remains limited. Many prior studies have relied on regression or partial least squares rather than SEM, restricting analysis of complex mediation between GPMA and environmental performance (Al-Sabi *et al.,* 2024). SEM can simultaneously estimate multiple mediation paths and account for measurement error, providing a more rigorous test of relationships among GPMA, attitudinal and productivity constructs, and environmental performance.

This research extends Green HRM literature by clarifying how GPMA generates environmental benefits beyond its influence on employee outcomes. The findings show that GPMA directly enhances environmental performance, while job satisfaction and perceived productivity do not play major mediating roles. Thus, environmentally oriented appraisal systems operate primarily as organisational resources embedded in formal performance assessment rather than relying only on employees' subjective perceptions. Drawing on Social Exchange Theory and the Resource-Based View, the study addresses psychological responses at the employee level and the development of organisational capabilities, offering a more nuanced theoretical explanation of GPMA's role in sustainability. The proposed relationships among green performance management and appraisal, job satisfaction, perceived employee productivity, and environmental performance are illustrated in Figure 1.

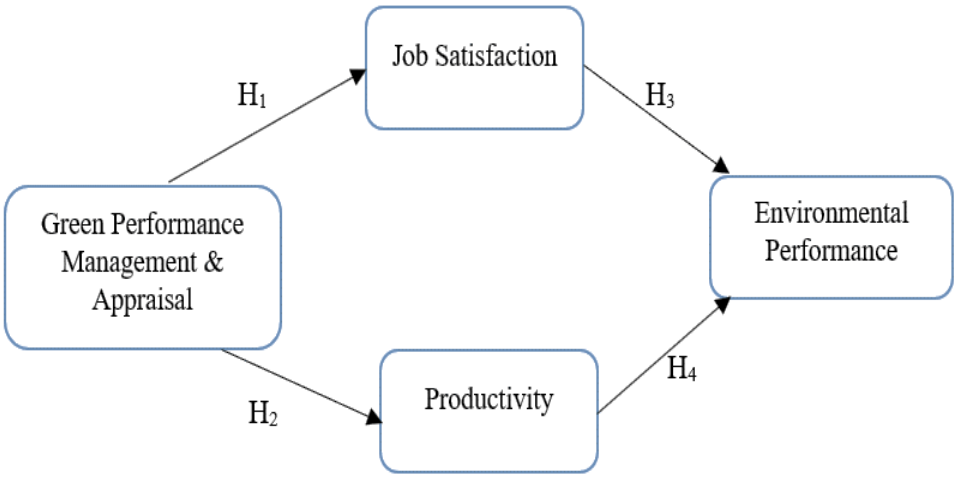


Figure 1. Conceptual Model

The paper advances prior work on green performance management by examining its effects on job satisfaction and perceived employee productivity using SEM in service-sector organisations. It explains how GPMA contributes to or reduces environmental performance through job satisfaction, productivity and environmental outcomes, thereby addressing two key gaps: the need for rigorous modelling of sustainable HR practices and the need for stronger methodological approaches to link strategic HR practices, employee attitudes, productivity and sustainability results (Khuntia *et al.,* 2025; Obeidat *et al.,* 2023). By focusing on GPMA rather than aggregate GHRM constructs, this study shows that regression-based, aggregate analyses have often masked the distinct impact of individual HR practices. The present research fills this gap by employing SEM to examine capability building through GPMA and how GPMA may indirectly affect environmental performance via attitudinal and operational pathways.

2. Theoretical Background and Hypothesis Development

Social Exchange Theory (SET) explains how employees interpret organisational practices and respond based on reciprocity: when one party is treated positively it expects similar responses from the other (Prakash *et al.,* 2025). In HRM, employees do not only react to HR practices but read them as signals of organisational intent, values and commitment. This perspective aligns with Green Performance Management and Appraisal (GPMA), which incorporates environmental objectives and sustainability standards into performance evaluation and feedback. GPMA links employees' results to their responsibility toward the environment and communicates favourable signals that can elicit positive attitudes and behaviours. When employees perceive their efforts as aligned with organisational sustainability goals, they experience greater meaningfulness, recognition and support, which can enhance job satisfaction and motivate productivity through clearer expectations, feedback and accountability. Environmental criteria help improve work processes, reduce waste and promote better practices, making SET an appropriate framework for explaining the relationships between GPMA, job satisfaction and productivity as employee perceptions of organisational practices.

2.1 Resource-Based View as a complementary organisational-level perspective

The Resource-Based View (RBV) posits that organisations achieve sustainable competitive advantage by developing unique, valuable and hard-to-imitate resources and capabilities through the effective use of their existing resources (Barney *et al.,* 2011; J. Barney *et al.,* 2001). Within this framework, HRM systems are not merely administrative tools but strategic resources that shape employees' abilities and, in turn, organisational performance (Jiang *et al.,* 2012; Wright *et al.,* 1994). In the context of Green HRM, GPMA contributes to distinctive organisational capabilities by embedding environmental objectives into performance management and by transforming environmental performance from symbolic commitment into operational practice (Guerc*i et al.,* 2016; Jabbour *et al.,* 2008). By integrating environmental criteria into appraisal processes, organisations build employees' environmental knowledge, skills and pro-environmental attitudes, creating green human capital that enhances eco-efficiency and remains rooted in firm-specific learning (Jabbour & Santos, 2008; Chen & Chang, 2013). Performance management systems function as organisational routines that guide employee behaviour in line with strategic priorities, and a green performance management architecture signals strategic commitment to sustainability by aligning performance objectives with ecological goals (Becker & Huselid, 2006).

RBV also clarifies the link between productivity and green human capital. Employees assessed against environmental benchmarks are motivated to optimise their work processes and achieve better operational and ecological outcomes (Longoni *et al.,* 2018). When green human capital is combined with other firm resources, it forms socially complex capability systems that support environmental performance and capability development (Russo & Fouts, 1997). GPMA strengthens these capabilities by embedding environmental accountability in daily work practices and by using ongoing assessment and feedback to develop internalised environmental norms that encourage continual improvements through waste reduction and resource conservation (Judge & Douglas, 1998). Firms that integrate sustainability into performance management can build competencies that are valuable, difficult to imitate and relatively rare, contributing to competitive advantage through improved ecological sustainability. While GPMA itself is not automatically a valuable, rare, inimitable and non-substitutable (VRIN) resource, RBV suggests that, when combined with firm-specific learning, culture and complementary systems, GPMA helps create green capabilities and behavioural alignment that competitors may find difficult to replicate. In this sense, GPMA operates

not only as an HR function but as a contributor to firm-specific capabilities that support sustainable competitive advantage in environmental performance.

In this study, SET is used to explain employee-level relationships, whereas RBV provides an organisational-level lens on how employee skills and behaviours generated by GPMA can be transformed into environmental performance advantages over time. The integration of these two theories avoids treating a replicable HR practice as automatically VRIN while recognising the strategic relevance of company-specific capabilities that emerge from sustained GPMA implementation.

2.2 Green Performance Management and Appraisal

Traditional performance appraisal focuses primarily on efficiency and productivity in assigned tasks, but recent literature emphasises the need to align appraisal criteria with environmental objectives to embed sustainability in employee and organisational routines (Yusoff *et al.,* 2020; DeNisi & Smith, 2014). At the strategic level, performance management systems act as signalling devices that communicate organisational priorities and shape employee commitment. Green performance evaluation is defined as the systematic assessment of employees' performance in relation to their contributions to managing environmental impacts, including waste reduction, energy conservation and regulatory compliance. Studies show that incorporating environmental metrics into appraisal systems increases employees' pro-environmental behaviour and enhances organisational capacity to improve environmental performance (Masri & Jaaron, 2017). When performance appraisals recognise environmental contributions, they reinforce accountability and can motivate employees to go beyond formal job requirements and actively participate in sustainability initiatives (Saeed *et al.,* 2019). Research also indicates that green performance evaluations can indirectly improve business outcomes by strengthening environmental performance (Ghouri *et al.,* 2020).

Recent evidence suggests that the effectiveness of GPMA depends on employees' perceptions of fairness and organisational support. Appraisal systems viewed as transparent and development-oriented are associated with stronger employee commitment and engagement in environmental initiatives (Muisyo & Qin, 2021; Martins *et al.,* 2021). Overall, prior research highlights GPMA as an important mechanism for enhancing environmental accountability and aligning employee behaviour with organisational sustainability objectives, especially when combined with other Green HRM practices and embedded within a strong organisational green culture.

2.3 Job satisfaction

Past research shows that GHRM practices such as green recruitment, training, performance appraisal and rewards can strengthen employees' perceptions of organisational support and value congruence, leading to positive job-related outcomes (Baykal *et al.,* 2023). When employees perceive HR practices as environmentally responsible, they tend to develop stronger psychological attachment and job satisfaction because organisational values align more closely with their own (Ahmad & Umrani, 2019).

GHRM also has direct and indirect positive effects on job satisfaction via perceived psychological safety. Environmentally friendly HR processes contribute to supportive and meaningful work environments that encourage pro-environmental behaviours and reinforce employees' sense of purpose (Freire & Pieta, 2022; Moin *et al.,* 2021; Latan *et al.,* 2022). Evidence further suggests that organisations focusing on sustainability implement GHRM practices to improve well-being and satisfaction by fostering ethical responsibility and long-term organisational commitment (Vindhya Kalyani *et al.,* 2025; Xie *et al.,* 2023). Based on this literature, the following hypothesis is proposed:

H1: Green Performance Management and Appraisal has a positive significant influence on Job Satisfaction.

2.4 Perceived Employee Productivity (PEP)

Green Human Resource Management has attracted increasing research interest for its potential to enhance corporate productivity through environmentally oriented HR practices. Environmental training and green teamwork can increase eco-efficiency, reduce resource waste and improve productivity by optimising processes (Piwowar-Sulej & Iqbal, 2025; Moraes *et al.,* 2019). GHRM also positively influences both in-role and extra-role green behaviours among employees with high green work engagement, resulting in greater task efficiency, innovation and overall

workforce productivity (Aboramadan, 2022). Employees engaged in green behaviours often display heightened motivation, discretionary effort and innovative work behaviour, which are critical components of productivity (Rumman & Alqudah, 2024; Sayed Uddin *et al.,* 2023).

In service industries such as hospitality and healthcare, productivity is frequently assessed in terms of perceived effectiveness, use of time and engagement rather than purely output-based measures, due to the intangible, customer-focused nature of services (Pandey *et al.,* 2026). Behavioural indicators such as active participation, reasonable workload and minimal idle time can serve as appropriate proxies for productivity in these contexts, consistent with prior studies that define productivity and efficiency in terms of effort in labour-intensive sectors. Research further indicates that empowering employees to engage in green HR practices enables them to contribute proactively to environmental initiatives, improving operational performance and value creation. GHRM fosters a culture of accountability and continuous improvement, encouraging employees to work more efficiently and align their results with both productivity and sustainability objectives (Kumar & Chakraborty, 2022). Taken together, the literature suggests that GHRM functions as a strategic mechanism for enhancing productivity through eco-efficient practices, engagement and innovation. Accordingly, this study proposes:

H2: Green Performance Management and Appraisal has a significant positive influence on Productivity.

2.5 Environmental performance

Human resource systems contribute to environmental performance by shaping employee skills, attitudes and behaviours. Integrating environmental goals into HRM at the GHRM level can stimulate pro-environmental behaviour among employees (Bangwal *et al.,* 2017). Empirical evidence indicates a strong positive relationship between GHRM practices and environmental performance, as these practices enhance employees' environmental competence and support greater environmental orientation (Guerci *et al.,* 2016). GHRM also improves the effectiveness of proactive environmental management initiatives, which can lead to better firm performance outcomes (O'Donohue & Torugsa, 2016).

Studies show that GHRM influences environmental performance through psychological mechanisms such as environmental passion and organisational citizenship behaviour for the environment (OCBE) (Kuo *et al.,* 2022; Malik *et al.,* 2021; Gilal *et al.,* 2019). Environmental training and employee involvement further support superior environmental performance by fostering sustainable workplace behaviours (Hameed *et al.,* 2020; Paillé *et al.,* 2014). Although job satisfaction has historically been linked to positive organisational outcomes, RBV suggests that without operational capabilities such as productivity, attitudinal resources like job satisfaction may have limited strategic impact on environmental performance. Based on this theoretical and empirical evidence, the following hypotheses are advanced:

H3: Job Satisfaction has a significant positive influence on Environmental Performance.

H4: Productivity has a significant positive influence on Environmental Performance.

3. Materials and Methods

This study utilized quantitative data and a cross-sectional design to explore the relationships between GPMA (Green Performance Management & Appraisal), job satisfaction, perceived employee productivity, and environmental performance within the service sector. A descriptive and explanatory design was used to test the hypothesized model via Structural Equation Modelling (SEM) to simultaneously estimate multiple relationships between latent constructs.

The population for the study consisted of individuals employed in service sector organizations throughout Tamil Nadu, India due to the various nature of services present. As such, a stratified purposive sampling with convenience-based method has been used to secure representation from some of the major subsectors including IT, Banking & Financial Services, Healthcare, Hospitality, and Retail. Therefore, primary data were obtained using a structured online questionnaire conducted from March 2025 until August 2025. 584 valid responses were retained for analysis representing the recommended sample size for SEM.

Analyses were performed using Jamovi. Descriptive statistics were calculated to summarise the demographic characteristics of the participants. Using CFA, the measurement model was validated, and finally structural equations

modelling (SEM) was used to test the proposed relationships between constructs. Overall model fit was evaluated through the assessment of appropriate goodness-of-fit indices: χ^2/df, SRMR, RMSEA, GFI, AGFI, NNFI, IFI, TLI, and CFI indicating overall fit.

3.1 Measures

To observe the associations among environmental performance and paths of GPMA, a survey with 18 items. All constructs were measured on a 5-point Likert Scale with ratings ranging from 1 (strongly disagree) to 5 (strongly agree).

Perceptual measures based on prior literature Green Performance Management and Appraisal was with a final of 4 items (Haldorai *et al.,* 2022; Ojo *et al.,* 2022). Job Satisfaction was utilised with 6 items (Munir & Rahman, 2016). For Perceived Employee Productivity 3 items were used (Fry *et al.,* 2005). Environmental Performance was utilised to collaborators with 5 items (Jabbour *et al.,* 2010; Haldorai *et al.*, 2022).

4. Data Analysis

4.1 Demographics of employees

Table 1. Descriptive Statistics

Respondent's Profile	Categories	Percentage %
Gender	Female	32.0%
	Male	68.0%
Age Group	<25 years	20.5%
	25-35 years	40.8%
	36-45 years	17.1%
	46-58 years	17.1%
	>58 years	4.5%
Years of Experience	<5 years	46.1%
	6 - 10 years	24.8%
	11 -15 years	15.4%
	>15 years	13.7%
Education	Diploma	11.5%
	Bachelor	44.0%
	Master	30.5%
	Doctoral	3.8%
	Others	10.3%
Sector	IT	18.49%
	Banking & Financial	18.3%
	Healthcare	19.18%
	Hospitality	23.8%
	Retail	20.21%

The sample consisted of predominantly male respondents, comprising 68 % of the total, while female respondents comprised only 32%. A majority of the sample were between the ages of 25 and 35, comprising 40.8% of the total. The next largest age group was less than 25 with 20.5%, indicating a predominance of young employees in the workforce. Employees aged 36 to 45 and 46 to 58 accounted for 17.1% of the total sample, respectively, while respondents older than 58 comprised only 4.5% of the total.

Of the sample, the majority (46.1%) reported having less than 5 years of work experience. A further 24.8% reported having between 6 and 10 years of experience, while 15.4% reported having 11 to 15 years and 13.7% reported having more than 15 years of experience, ensuring the sample included respondents with a variety of experiences. In terms of education level, the biggest portion of respondents (44.0%) reported having earned a

bachelor's degree, while 30.5% reported having a master's degree, indicating that the sample will be adequately educated to investigate quantitative data regarding Green HRM practices mentioned in the table 1. According to the analysis by the sector specific, Hospitality registered the maximum share (23.80%) of the analysis followed by Retail (20.21%) and Healthcare (19.18%). IT (18.49%) and Banking & Financial (18.30%). Overall, there is an average difference in the percentages across the sectors, whereby Hospitality category has the widest share, whereas Banking & Financial depicted the minimum share.

4.2 Reliability Test

Table 2. Reliability Statistics

Items	Mean	SD	Cronbach's α
GPM_1	3.21	1.368	0.813
GPM_2			
GPM_3			
GPM_4			
PROD_1	3.15	1.38	0.8173
PROD_2			
PROD_3			
JS_1	3.303	1.308	0.810
JS_2			
JS_3			
JS_4			
JS_5			
JS_6			
EP_1	3.23	1.364	0.811
EP_2			
EP_3			
EP_4			
EP_5			

The information in Table 2 gives a detailed overview of both descriptive statistics and internal consistency measures for constructs such as Green Performance Management (GPM), Productivity (PROD), Job Satisfaction (JS), and Environmental Performance (EP). The average scores are between 3.15 to 3.303 and thus imply a positive attitude towards the respective practices and performance outcomes. Among all provided statistics the most significant result belongs to job satisfaction with its mean equaling to 3.303 and SD measuring 1.308, while productivity shows the lowest means among all statistics presented (M=3.15; SD=1.380). The result for standard deviations is between 1.308 to 1.380 which indicates reasonable changes in perceptions by the respondents. It is important to note, that Cronbach's alpha value for GPM (α=0.813), Productivity (α=0.817), Job Satisfaction (α=0.810), and Environmental Performance (α=0.811) exceeds 0.70 threshold and thus confirms the reliability of the scales used further in the empirical study.

4.3 Confirmatory Factor Analysis

As per the table 3, the factor loading, composite reliability, and AVE are confirmed to be satisfactory. The factor loadings are observed to be in the range of 0.772 to 0.846, which is above the minimum acceptable value of 0.70, and thus, it can be stated that all the indicators are successful in representing their underlying constructs. The Composite Reliability (CR) values are in the range of 0.859 for Productivity, going up to 0.922 for Environmental Performance, which greatly exceeds the suggested threshold of 0.70, indicating strong consistency within the items. The AVE values range from 0.636 for Job Satisfaction to 0.703 for Environmental Performance, thus surpassing the recommended value of 0.50. This means that every construct analyzed explains more than half of the variance in

the corresponding indicators. Overall, Table 3 shows strong evidence of composite reliability, internal consistency, and convergent validity of the measurement model used and thus legitimacy and appropriateness of the constructs in terms of their use in constructing the structural model and testing the hypothesis.

Table 3. Confirmatory Factor Analysis

Construct	Items	Factor Loading	Composite Reliability (CR)	AVE
Green Performance Management & Appraisal (GPMA)	GPM_1	0.807	0.877	0.6423
	GPM_2	0.772		
	GPM_3	0.807		
	GPM_4	0.819		
Perceived Employee Productivity (Prod)	PROD_1	0.816	0.859	0.669
	PROD_2	0.818		
	PROD_3	0.821		
Job Satisfaction (JS)	JS_1	0.829	0.913	0.636
	JS_2	0.784		
	JS_3	0.809		
	JS_4	0.782		
	JS_5	0.782		
	JS_6	0.798		
Environmental Performance (EP)	EP_1	0.834	0.922	0.7029
	EP_2	0.835		
	EP_3	0.846		
	EP_4	0.833		
	EP_5	0.844		

Table 4. Common Method Bias Test

Assessment Criteria	Result
Number of Items	18
Extraction Method	Minimum Residual Extraction with Oblimin Rotation
Kaiser–Meyer–Olkin (KMO) Measure	0.872
Number of Factors with Eigenvalue > 1	4
Total Variance Explained by All Factors	66.40%
Variance Explained by First Factor	21.30%
Threshold for Common Method Bias	< 50%
Result	Common Method Bias is not a serious concern

Table 4 illustrates an assessment of common method bias (CMB). The KMO value has been determined at 0.872 indicating an adequate adequacy for sampling purposes, and exploratory factor analysis revealed four factors with eigenvalues greater than 1, cumulatively explaining 66.40% of the total variance. Particularly, the first factor explained only 21.30% of the variance which is much lower than the threshold of 50% used in the Harman's single-factor method. Thus, the variance structure lacks a dominant factor, implying that common method bias is not a significant impediment to the findings of the study. The above results warrant proceeding with the rest of the analyses in terms of multivariate analysis.

4.4 Validity Test

Table 5. Discriminant Validity

Latent Variables	GPMA	Prod	JS	EP	**AVE**
GPMA	**0.8014**				**0.6423**
Prod	0.1399	**0.8179**			**0.669**
JS	0.1303	0.1452	**0.7975**		**0.636**
EP	0.1856	0.1057	0.0217	**0.8384**	**0.7029**

Discriminant validity was evaluated through the Fornell–Larcker criterion as shown in Table 5. The diagonal entries are the square root of Average Variance Extracted (√AVE) of each latent variable, while the off-diagonal entries refer to the correlation between the variables. The values of √AVE for GPMA (0.8014), PROD (0.8179), JS (0.7975) and EP (0.8384) are more than their inter-construct correlation. In fact, the inter-construct correlation seems to be in the range of 0.0217 to 0.1856. This shows that the square root of AVE values is higher than the inter-construct correlations hence discriminant validity is proved.

Table 6. Collinearity Assessment

Dependent Variable	**VIF**	**Tolerance**	**Decision**
Job Satisfaction	1	1	No multicollinearity
Perceived Employee Productivity	1	1	No multicollinearity
Environmental Performance	< 1.10	> 0.90	No multicollinearity

The findings of the multicollinearity assessment related to the dependent variables are provided in Table 6. The Job Satisfaction and Productivity variables show a VIF value of 1.00; meanwhile, the Environmental Performance variable has a VIF value of less than 1.10, with the respective tolerance values being 1.00 and greater than 0.90. All of these values are well below the typical cutoff point for VIF of 5.0, and well above the lowest cutoff point for tolerance of 0.20, which means that there is no problematic multicollinearity among model predictors. It means that the relationships between the dependent variables Job Satisfaction, productivity, and Environmental Performance are clean from the influence of multicollinearity.

4.5 SEM -Path Model

Table 7. SEM – Goodness of Fit indices

χ 2 / df	**p value**	**SRMR**	**GFI**	**AGFI**	**RMSEA**	**NNFI**	**IFI**	**TLI**	**CFI**
195/130		<0.08	>0.9	>0.9	<0.08	>0.9	>0.9	>0.9	>0.9
1.5	< 0.001	0.037	0.99	0.986	0.029	0.988	0.99	0.988	0.99

Table 7 presents the goodness-of-fit statistics for the given structural equation model. This model has a good fit as the value of χ^2/df is 1.50, which is significantly less than the maximum value of 3.0. In addition, the cutoff values laid down for SRMR and RMSEA are also satisfied since the values for these two indicators are less than 0.08, SRMR is 0.037 and RMSEA is 0.029. The values of GFI (0.990), AGFI (0.986), NNFI (0.988), IFI (0.990), TLI (0.988), and CFI (0.990) exceed the minimal value required for these indices which is set at 0.90. It is important to mention that χ^2 test value is significant statistically ($p < 0.001$), yet it is important to keep in mind that this test is very sensitive to sample size. All in all, it can be concluded that all indices together have confirmed good fit of SEM model.

The structural path estimates and mediation results showed in Table 8. The results of the analysis with 3000 resample of bootstrapping method reveal that GPMA influences both Job Satisfaction ($\beta = 0.133$, $p = 0.003$) and Productivity ($\beta=0.142$, $p = 0.002$) positively. However, no significant influence of either Job Satisfaction ($\beta= -0.012$, $p=0.797$) or Productivity ($\beta=0.082$, $p=0.073$) on Environmental Performance has been found, and H3 and H4 are rejected. Additionally, GPMA is subject to a positive and significant influence on Environmental Performance ($\beta=0.186$, $p<0.001$) based on H5. The mediation analysis shows that neither Job Satisfaction nor Productivity contributes to the mediation in the GPMA-Environmental Performance link. Overall, the GPMA has a direct and positive influence on Environmental Performance. This means that GPMA has a direct impact on Environmental Performance and does not operate through Job Satisfaction or Productivity.

Table 8. Hypothesis Result

Path	Hypothesis	Estimate (β)	p-value	Decision
GPMA → Job Satisfaction	H1	0.133	0.003	Significant
GPMA → Perceived Employee Productivity	H2	0.142	0.002	Significant
Job Satisfaction → Environmental Performance	H3	-0.012	0.797	Not Significant
Perceived Employee Productivity → Environmental Performance	H4	0.082	0.073	Not Significant
GPMA → Environmental Performance	H5	0.186	<0.001	Significant
Indirect Path		95% Bootstrap CI	p-value	Decision
GPMA → Job Satisfaction → Environmental Performance		[-0.016, 0.011]	0.81	Not Supported
GPMA → Perceived Employee Productivity → Environmental Performance		[-0.001, 0.029]	0.138	Not Supported

Thus, the need to shift attention to direct organizational mechanisms that allow for embedding environmental aspects into employees' performance and sustainability results is evident from this finding. The absence of significant mediation effect indicates that the pathways related to employees' attitude and productivity may not necessarily be sufficient to account for the implementation of GPMA in environmental terms. The estimated structural relationships among these constructs are presented in Figure 2.

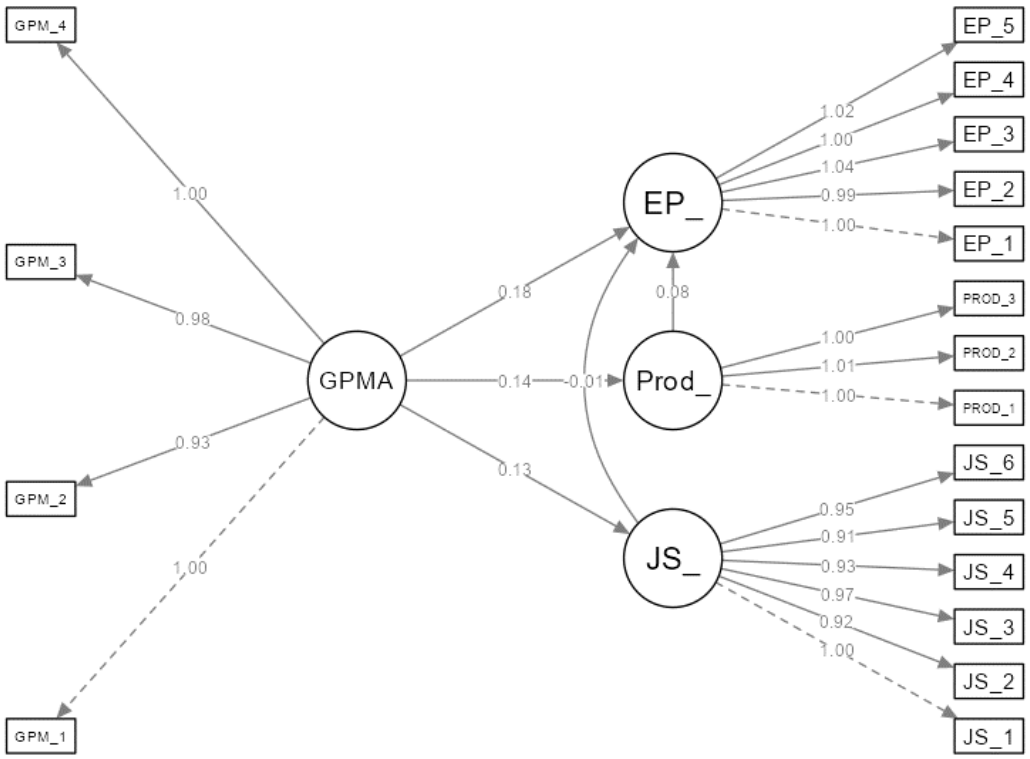


Figure 2. SEM Model

5. Discussions

This study examined the structural relationships among Green Performance Management and Appraisal (GPMA), job satisfaction, perceived employee productivity and environmental performance in service organisations using SEM. The results provide partial but theoretically consistent support for the proposed model and extend the

Resource-Based View (RBV) by positioning GPMA as a capability-building HR mechanism that enhances environmental performance through human capital rather than attitudes alone.

In RBV terms, HR systems embed valuable, rare and difficult-to-substitute capabilities that can support sustainable competitive advantage. By aligning employee behaviour with organisational environmental goals, GPMA operates as a strategic capability that links performance criteria to sustainability outcomes (Shafaei & Nejati, 2024). The significant positive relationship between GPMA and job satisfaction ($\beta = 0.133$, $p = 0.003$) is consistent with evidence that environmentally focused HRM practices strengthen employees' psychological attachment and perceptions of organisational support (Baykal *et al.,* 2023). When environmental objectives are incorporated into appraisal systems, employees attach greater meaning to their roles in achieving these goals and perceive stronger value congruence with the organisation, which reinforces job satisfaction and signals organisational commitment to sustainability (Fernandez & Ganesan, 2023).

GPMA also has a positive impact on perceived employee productivity ($\beta = 0.142$, $p = 0.002$), supporting H2. This finding aligns with arguments that green HRM enhances eco-efficiency and task performance by specifying environmental standards and establishing accountability for meeting them. From an RBV perspective, productivity reflects effective use of green human capital: appraising contributions to environmental management encourages more efficient resource use, less waste and better operational outcomes (Umrani *et al.,* 2022). Prior studies similarly report that green performance management mediates the link between green hiring and sustainable performance and promotes both in-role and extra-role behaviours (Kumar & Chakraborty, 2022; Longoni *et al.,* 2018).

The non-significant direct relationship between job satisfaction and environmental performance ($\beta = -0.012$, $p = 0.797$) does not imply that satisfaction is irrelevant to environmental outcomes. Rather, it suggests that job satisfaction may operate as a more distal attitudinal construct whose influence is channelled through behavioural mechanisms not fully captured in the present model (Al-Sabi *et al.,* 2024). Green HRM research indicates that satisfied employees tend to exhibit more pro-environmental behaviours, engagement and initiatives, which can support higher environmental performance, but these processes may require explicit behavioural mediators in the model (Vindhya Kalyani *et al.,* 2025; Ahmed *et al.,* 2024; Hameed *et al.,* 2022). The mismatch between individual-level job satisfaction measurement and more organisation-level environmental performance indicators may also attenuate the direct effect.

Perceived employee productivity did not show a statistically significant direct effect on environmental performance ($\beta = 0.082$, $p = 0.073$), meaning H4 was not supported. Even so, efficient work processes remain conceptually important for reducing energy use, material consumption and waste, but the present data indicate that these operational effects are primarily activated through GPMA rather than productivity alone. The mediation results suggest that GPMA contributes to environmental performance through its influence on productivity more than through job satisfaction, reinforcing the view that green HRM builds environmental capacity by embedding sustainability in performance management and everyday work practices. These findings refine RBV by showing that GPMA improves environmental performance by translating green intent into structured, productivity-related appraisal criteria, indicating that in service-based organisations environmental sustainability depends less on attitudes in isolation and more on productive capabilities codified in formal performance systems.

6. Theoretical Implications

Using the Resource-Based View (RBV) to enhance the theory of environmentally conscious business practices, this research considers Green Performance Management and Appraisal (GPMA) as a non-physical strategic resource of an organization to improve environmental performance by developing human capital as an organizational asset. The VRIN principle (Barney *et al.,* 2011; J. Barney *et al.,* 2001) is a common resource with the potential for sustained competitive advantage. Based on these principles, we have demonstrated that GPMA improves productivity and provides the means for developing green human capital and improving environmental performance and thus has been established as a performance-based strategic organizational resource.

The main theoretical contribution of the research is the discovery of a mechanism based on ability through which green performance management appraisal (GPMA) increases environmental performance. Contrary to previous studies on Green Human Resource Management claiming that applying an environmentally conscious human resource

management strategy leads to improved sustainability due to the enhancement of positive employee attitudes, it was found that GPMA has a direct influence on environmental performance. Thus, the integration of environmental objectives into formal appraisals should be treated as the company capability. This expands the applicability of Social Exchange Theory in the sense that positive employee attitudes only do not guarantee effective results without formal organizational systems.

In this study, differentiating attitudinal resources (job satisfaction) and capability-based resources (productivity) to extend the Resource-Based View. However, only productivity provides a company with strategic value that enhances their environmental performance. Thus, not all internal resources contribute to competitive advantages equally only those that are imbedded in the company's processes and outputs. The minimal direct impact of job satisfaction on environmental performance can be viewed as a refinement to the current understanding of RBV regarding the role of attitudinal states as possible strategic resources: these will not become strategic resources unless converted to capability-based performance capabilities (Arshad & Liu, 2025; Jiang *et al.,* 2012). In contrast, productivity is the bridge that allows green HR systems to transform into quantifiable environmentally beneficial outcomes, thus supporting an extended view of RBV's dynamic capabilities (Helfat & Martin, 2015). In addition, this research adds to the body of knowledge regarding the green RBV evolutionary literature by providing empirical data on the mediating relationship between green HR systems and sustainable business outcomes in service industries (Amrutha & Geetha, 2021; Yusliza *et al.,* 2020; Chen & Chang, 2013). By integrating SEM-based mediation analysis, the research strengthens theoretical clarity on how environmentally aligned appraisal systems build firm-specific sustainability capabilities.

7. Managerial and Social Implications

In addition to being a significant factor in both productivity and an indirect contributor to environmental performance through productivity, GPMA can have more benefit to organizations than just symbolic "green" policies by implementing measures of actual environmental sustainability into their performance appraisal systems. Therefore, organizations' performance appraisals should explicitly evaluate organization's conservation of resources, the reduction of waste, and the achievement of outcomes associated with delivering sustainable services (Tirno *et al.,* 2023). Managers need to begin incorporating KPIs for tracking environmental impact as part of the overall appraisal system for workers. This requires that they connect KPIs to productivity results rather than just using attitudinal changes in employees. By doing this, managers will be able to ensure that green HR programs lead to measurable improvements in the environment.

Social Exchange Theory highlights how various environmentally friendly assessment systems used by organizations indicate commitment to sustainability practices and environmentally-friendly policies. Such judgements of employees may result in certain actions reflecting their attitudes concerning satisfaction and productivity levels. The research has confirmed the incorporation of the principles of social exchange into green performance evaluation, which connects environmentally-oriented HR practices with employees' behaviors and actions. According to the Resource-Based View, HR practices are distinguished from strategic advantages provided through their implementation. GPMA practices can be easily copied, but the acquired green intellectual capital, organizational experience, behavior patterns as well as sustainability-oriented competencies, may be unique to a certain company. Therefore, GPMA becomes an important means for creating business value by developing those capabilities required to provide environmental performance. The combination of both theories allows to comprehend the way employee-level processes take place within the organization, whereas the Resource-Based View is used to understand the process of generation of employees' capabilities enabling the organizations to achieve positive environmental outcomes.

In addition to integrating green metrics into their performance appraisals, organizations will also benefit from aligning their green appraisals with the organization's performance feedback, training, and innovation support systems, as perceived employee productivity will mediate the relationship between GPMA and environmental performance (Gazi *et al.,* 2025; Kuo *et al.,* 2022). Clear and constructive discussions around performance appraisals can boost employee green innovative work behaviours and lead to improved organisational performance (Jimoh *et al.,* 2025; Rumman & Alqudah, 2024). Additionally, the inclusion of green performance measures in incentive and

reward systems will help to further reinforce a culture of sustainable performance (Obeidat *et al.,* 2023; Shafaei & Nejati, 2020; Raharjo *et al.,* 2026).

Although the direct impact of job satisfaction on environmental performance was not evidenced by the current research, GPMA substantially contributes to improving employee satisfaction within the context of the workplace/organizational sustainability movement. Thus, developing green appraisal models requires managers to develop those models as a value and supportive strategy instead of a compliance-driven strategy, so that the models can continue to enhance employee morale, employee engagement, and employee satisfaction in the workplace (Uddin *et al.,* 2025; Liu *et al.,* 2024; Tanova & Bayighomog, 2022). From a social viewpoint, the adoption of GPMA within service-based organizations aligns with the Global Sustainable Development Goals, and most specifically with the area of responsible production and consumption. By optimizing their sustainable productivity as it pertains to their environmental accomplishments, organizations reduce their use of resources and limit their environmental impacts, while continuing to provide quality service, therefore, enhancing their credibility and reputation among their stakeholders and improving the quality of life for those living in their communities (Bibi *et al.,* 2025). Within several developing countries including India GPMA will help serve as a vehicle for transforming the ability of service-based organizations to develop structured methods for developing sustainable practices at the workforce level. Ultimately encouraging a continuous commitment to environmentally responsible and socially accountable business practices.

8. Limitations & Future Directions

This investigation employed a cross-sectional design to show some connection between GPMPA, job satisfaction, perceived employee productivity and environmental performance. However, longitudinal research can strengthen the linkages between green HRM and these variables over time. As the sample used in the study was limited to the service sector in Tamil Nadu, the generalisation of results cannot be applied to other sectors or regions internationally. Also, this study does not account for potential reverse causality/endogeneity between perceived employee productivity and environmental performance. Future research can expand upon these limitations by including sectors outside of the service sector, such as manufacturing and public organisations, and by including cultural comparisons to enhance the results. The use of a self-report questionnaire may have created response bias, therefore, future investigations should consider using multiple sources of data for reference to obtain performance data on an managerial level. Additionally, future studies should also develop a framework to analyse the effects of moderating variables like organisational culture, type of leadership, and green innovation on GPMPA to provide a more comprehensive understanding of the GPMPA's overall effectiveness.

9. Conclusion

This study examined how Green Performance Management and Appraisal (GPMA) influences job satisfaction, perceived employee productivity and environmentally sustainable practices in service-sector organisations in Tamil Nadu, India. Using Structural Equation Modelling, GPMA emerged as a positive contributor to both job satisfaction and perceived productivity. When environmental criteria are formally embedded in appraisal systems, employees report stronger organisational support and clearer alignment with sustainability goals. The findings extend theory by showing that GPMA enhances environmental performance primarily through organisational capabilities built into performance measurement, rather than through job satisfaction or perceived productivity as the main drivers of sustainability outcomes.

Further, job satisfaction was found not to be a direct contributor to the level of environmental performance. Perceived Employee Productivity which does not enables GPMA to positively influence environmental performance. Therefore, GPMA significantly enhances environmental performance primarily by improving employees' efficiency, concentration, and task-related contributions, rather than simply by improving employees' attitudes towards the organisation. In addition, the findings provide support for the strategic necessity of incorporating green indicators into performance management systems to achieve SDGs at both an individual and organisational level. Future research could use longitudinal methods to assess GPMA and sustainable HRM practices over time; include a wider range of industries or geographic locations; and consider the impact of additional mediators, including green innovation and organisational culture, to sustainable HRM practices.

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Author Contribution Statement

S. Saravanan: Conceptualization, Methodology, Data Curation, Investigation, Formal Analysis, Software, Validation, Writing – Original Draft, Writing – Review & Editing. G. Yoganandan: Conceptualization, Methodology, Supervision, Project Administration, Visualization, Validation, Writing – Original Draft, Writing – Review & Editing. G. Jayashree Hareesh: Conceptualization, Resources, Writing – Review & Editing. M. Dineshkumar: Conceptualization, Resources, Writing – Review & Editing. S.R. Monisha: Conceptualization, Resources, Writing – Review & Editing. All authors read and approved the final version of this manuscript.

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Yes

Conflict of Interest

The authors have no conflicts of interest to declare. There is also no financial interest to report. The authors certifies that the submission is original work and is not under review at any other publication.

Ethical Approval

All participants provided informed consent prior to their participation. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki.

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