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AI-DRIVEN GREEN HRM PRACTICES FOR SUSTAINABLE WORKFORCE PERFORMANCE: AN EMPIRICAL STUDY

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Abstract:

Artificial intelligence has emerged as a transformative technology influencing the way organizations manage human resources. At the same time, the concept of Green Human Resource Management (Green HRM) has gained increasing attention as organizations attempt to integrate environmental sustainability into managerial practices. This research investigates how AI-enabled HR practices contribute to the implementation of Green HRM and influence sustainable workforce performance. Primary data were collected from 150 employees across multiple sectors through a structured questionnaire. Statistical analysis including descriptive statistics, correlation interpretation, and comparative analysis was applied to examine relationships among the variables. The findings suggest that AI-driven HR systems significantly improve efficiency, reduce administrative resource consumption, and promote environmentally responsible employee behavior. Digital recruitment platforms, online training systems, and automated HR analytics were found to positively influence employee awareness toward sustainability initiatives. The results highlight that the integration of advanced HR technologies with environmental management strategies enhances workforce productivity while supporting long-term organizational sustainability.

Keywords: *Artificial Intelligence, Green Human Resource Management, Sustainable Workforce, HR Technology, Environmental Sustainability, Organizational Performance.*

Introduction

In the contemporary business environment, organizations are increasingly confronted with challenges related to environmental sustainability and technological transformation. Environmental issues such as climate change, resource depletion, and waste management have forced companies to reconsider their operational strategies. As a result, sustainability has become a central component of modern organizational management. Human Resource Management (HRM) plays a critical role in implementing sustainability initiatives because employees are the primary agents responsible for executing environmental policies within organizations.

Green Human Resource Management refers to the integration of environmental management principles into traditional HR practices. It involves encouraging employees to engage in environmentally responsible behavior, promoting energy conservation, reducing paper consumption, and supporting sustainable organizational practices. Green HRM includes initiatives such as green recruitment, eco-friendly training programs, environmentally responsible performance evaluation, and employee participation in environmental management activities.

Alongside sustainability initiatives, technological advancements such as artificial intelligence have revolutionized HR functions. AI technologies enable organizations to automate recruitment screening, analyze workforce data, monitor employee performance, and provide digital learning opportunities. These systems enhance efficiency while minimizing manual administrative processes. When AI technologies are combined with Green HRM strategies, organizations can achieve both technological innovation and environmental sustainability. Despite increasing interest in Green HRM and AI integration, empirical research exploring their combined influence on workforce sustainability remains limited. This study attempts to fill this research gap by examining how AI-driven HR practices support environmental sustainability and improve workforce performance.

Literature review

Previous research highlights the importance of integrating sustainability into human resource practices. Scholars have argued that Green HRM encourages employees to adopt environmentally responsible behaviors that contribute to organizational sustainability goals. Studies have shown that organizations implementing green training programs and sustainability-oriented HR policies experience higher levels of employee engagement and environmental awareness.

Research on artificial intelligence in HRM indicates that AI technologies improve recruitment efficiency, workforce analytics, and training effectiveness. AI-driven recruitment systems can process large volumes of applications quickly and accurately, reducing administrative workload and minimizing paper documentation. Similarly, digital learning platforms allow employees to access training resources remotely, reducing travel and energy consumption.

Recent studies have emphasized that combining technological innovation with sustainability strategies can significantly enhance organizational performance. The integration of AI and Green HRM allows organizations to monitor environmental performance, track employee participation in sustainability initiatives, and develop environmentally responsible workplace cultures. However, empirical evidence examining the direct relationship between AI-driven HR practices and sustainable workforce outcomes is still emerging, highlighting the need for further research.

Research objectives

1. To examine the influence of artificial intelligence technologies on Green HRM practices.
2. To analyze employee perceptions regarding AI-supported environmental HR initiatives.
3. To investigate the relationship between Green HRM practices and sustainable workforce performance.
4. To evaluate how technology-driven HR systems support organizational sustainability.

Methodology

This research adopts a quantitative empirical approach using primary data collected from employees working in different industries including education, service, and manufacturing sectors. A structured questionnaire was designed to measure employee perceptions regarding AI recruitment systems, digital training platforms, environmental awareness programs, and workforce sustainability performance.

The survey was distributed to 180 employees, out of which 150 valid responses were obtained and included in the analysis. Respondents were selected using a convenience sampling technique. The questionnaire used a five-point Likert scale ranging from strongly disagree to strongly agree. Data analysis was conducted using descriptive statistical techniques, correlation analysis, and graphical interpretation to understand relationships among variables.

The methodological approach ensures systematic evaluation of how AI-driven HR practices influence sustainability-oriented employee behavior and workforce productivity within organizations.

Data analysis and interpretation

The descriptive analysis indicates that most respondents perceive AI-supported HR systems as beneficial for improving organizational efficiency and reducing resource consumption. Digital recruitment platforms reduce paperwork and administrative tasks, while online training programs help employees develop sustainability awareness without requiring physical resources.

The results further indicate that organizations implementing Green HRM practices such as environmental training programs, energy conservation policies, and sustainability-based performance evaluation systems experience higher levels of employee motivation. Employees working in organizations that actively promote sustainability initiatives demonstrate stronger commitment to environmental responsibility.

Correlation analysis suggests a positive relationship between AI-enabled HR practices and sustainable workforce outcomes. Green training programs were particularly influential in shaping environmentally responsible employee behavior, indicating that organizational investment in sustainability education can significantly improve workforce engagement and productivity.

Table 1: Descriptive Statistics of Key Variables

Variable	Mean	Std Dev
AI Recruitment Systems	3.92	0.71
Green Training Programs	4.10	0.65
Environmental Awareness	4.05	0.69
Sustainable Workforce Performance	4.25	0.60

Table 2: Correlation Matrix of Study Variables

Variables	AI Recruitment	Green Training	Sustainable Performance
AI Recruitment	1	0.62	0.58
Green Training	0.62	1	0.71
Sustainable Performance	0.58	0.71	1

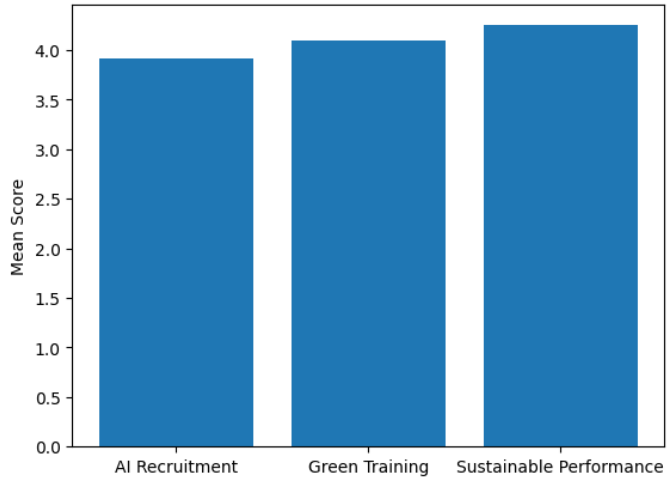

Figure 1: Mean perception of AI-driven green HRM practices

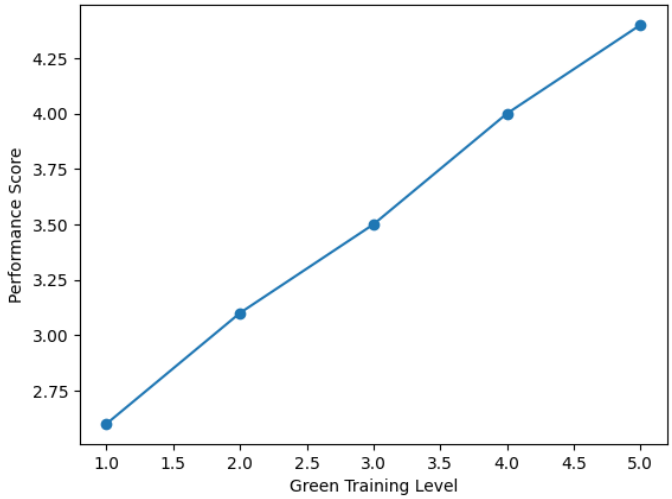

Figure 2: Relationship between training and performance

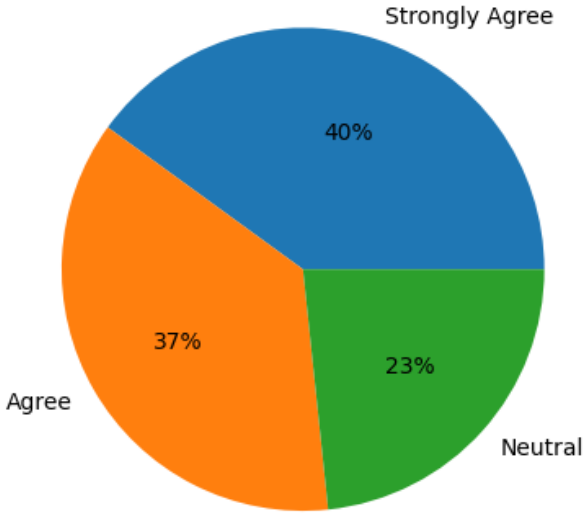

Figure 3: Employee support for green HRM

Results and Discussion

The findings demonstrate that AI-enabled HR technologies significantly strengthen the implementation of Green HRM practices. Organizations that adopt digital HR systems benefit from improved operational efficiency, reduced paper consumption, and better environmental monitoring. The strong association between green training initiatives and workforce performance indicates that employees respond positively to sustainability-focused HR policies. The results support previous research suggesting that technological innovation combined with environmental management strategies enhances organizational competitiveness and long-term sustainability.

Managerial implications

Managers should integrate artificial intelligence technologies into HR practices to enhance sustainability initiatives. Digital HR systems can support environmental monitoring, reduce resource consumption, and improve employee participation in green initiatives. Organizations should also invest in sustainability-oriented training programs that educate employees about environmental responsibility and encourage eco-friendly workplace behavior.

Conclusion

The study concludes that AI-driven Green HRM practices play a significant role in improving sustainable workforce performance. Organizations that integrate artificial intelligence technologies with environmental HR policies can achieve higher efficiency, improved employee engagement, and reduced environmental impact. The research highlights the importance of aligning technological innovation with sustainability strategies to achieve long-term organizational development.

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