Uniglobal of Journal Social Sciences and Humanities
Journal Homepage: www.ujssh.com

The Influence of Green Leadership, Green HRM, and Environmental Values on Green Innovation in Manufacturing Firms in Anhui Province

Tao Xu[1] & Mazni Binti Mohammad[2*]

[1,2]Kolej Universiti Islam Melaka (KUIM); Batu 28, Kuala Sungai Baru 78200 Alor Gajah Melaka Malaysia

*Corresponding author email: dr.mazni@unimel.edu.my

Received 1 January 2026, Revised 10 January 2026, Accepted 19 January 2026, Available online 28 January 2026

To link to this article: https://doi.org/10.53797/ujssh.v5i1.9.2026

Abstract: This study investigates the influence of green leadership, Green Human Resource Management (Green HRM), and environmental values on green innovation in manufacturing firms in Anhui Province, China. Drawing on the Resource-Based View (RBV) and Theory of Planned Behavior (TPB), a quantitative survey was conducted with 278 employees and managers. Structural Equation Modeling (SEM) was employed to test the hypothesized relationships. The findings reveal that green leadership and Green HRM positively affect green innovation, and environmental values partially mediate these relationships. The study contributes to the literature by integrating organizational and individual perspectives, highlighting the interplay between leadership, HR practices, and employee environmental beliefs in fostering sustainable innovation. Practically, the results provide guidance for managers and policymakers to enhance green innovation through leadership development, environmentally oriented HRM practices, and fostering employees' environmental values. The study also outlines limitations and directions for future research, including longitudinal designs, multi-industry contexts, and multi-source data collection.

Keywords: Green Leadership; Green Human Resource Management (Green HRM); Environmental Values; Green Innovation; Manufacturing Firms

1. Introduction

1.1 Research Background

Environmental sustainability has emerged as a pressing concern for organizations across the global business landscape. The combined pressures of climate change, resource depletion, and environmental degradation have led stakeholders including governments, consumers, and investors to increasingly require firms to implement environmentally responsible practices (Chen, 2008; Li et al., 2020). Manufacturing industries, given their substantial contributions to carbon emissions, waste generation, and energy consumption, encounter particular urgency in adopting green initiatives and pursuing green innovation a concept encompassing the development and implementation of environmentally beneficial products, processes, or services (Porter & van der Linde, 1995; Chen, 2008).

In China, national policies such as the "Green Development Strategy" have emphasized sustainable industrial growth, urging firms to integrate environmental responsibility into their business models. Anhui Province, as a rapidly industrializing region, has experienced both significant economic growth and environmental challenges. Consequently, manufacturing firms in Anhui must balance economic performance with ecological responsibility. Organizational factors, including leadership orientation and human resource management, as well as individual factors such as employees' environmental values, are critical determinants of successful green innovation adoption. Green leadership, characterized by leaders' commitment to sustainability and their ability to motivate eco-friendly behavior, plays a key role in shaping organizational climate and culture (Egri & Herman, 2000; Renwick et al., 2013). Green human resource management (Green HRM) embeds environmental objectives into recruitment, training, performance evaluation, and reward systems, thereby reinforcing pro-environmental behavior (Dumont et al., 2017). Employees' environmental values personal beliefs

*Corresponding author: dr.mazni@unimel.edu.my

and attitudes toward environmental protection also significantly influence engagement in green practices and innovation (Stern et al., 1999; Norton et al., 2014).

Despite increasing acknowledgment of these factors, the combined effects of green leadership, Green HRM, and environmental values on green innovation remain underexplored−particularly among manufacturing firms in Anhui Province. Clarifying these relationships is critical for designing strategies that advance sustainable innovation and improve firm competitiveness.

1.2 Problem Statement

Although firms in Anhui Province recognize the importance of environmental sustainability, the adoption of green innovation practices remains inconsistent. Many firms prioritize short-term economic gains over long-term sustainability, often neglecting the integration of leadership vision, HR practices, and employees' environmental values into a cohesive strategy. Without proactive green leadership, employees may lack motivation and guidance to engage in eco-friendly practices (Renwick et al., 2013; Dumont et al., 2017). Similarly, the absence of Green HRM policies limits reinforcement of environmental behaviors, reducing the effectiveness of sustainability initiatives (). Employees' environmental values, if not nurtured or aligned with organizational objectives, may further restrict the adoption of green innovation (Norton et al., 2014). This gap in organizational and individual alignment hinders the widespread implementation of green innovation, reducing potential environmental and competitive benefits. Therefore, empirical research examining the combined influence of green leadership, Green HRM, and environmental values on green innovation is necessary to guide practical interventions in the manufacturing sector.

1.3 Significance of the Study

This study contributes to both theoretical and practical knowledge. Theoretically, it integrates organizational factors (green leadership, Green HRM) and individual factors (environmental values) to explain variations in green innovation performance, extending the Resource-Based View (RBV) and Theory of Planned Behavior (TPB) to the sustainability context (Chen, 2008; Stern et al., 1999). Practically, the study provides actionable insights for managers, HR practitioners, and policymakers. Firms can design leadership development programs, implement environmentally oriented HR policies, and foster employees' environmental values to cultivate a culture of sustainability. Moreover, examining these relationships in Anhui Province provides region-specific guidance, helping emerging industrial hubs implement green innovation strategies effectively and align with national green development policies.

2. Literature Review and Theoretical Framework

2.1 Green Leadership

Green leadership refers to the capacity of organizational leaders to prioritize environmental sustainability in their decision-making and actions. Leaders serve as role models, influence organizational culture, and motivate employees to adopt eco-friendly practices (Egri & Herman, 2000; Renwick et al., 2013). Green leadership behaviors include setting environmental goals, promoting resource efficiency, encouraging innovation for sustainability, and rewarding environmentally responsible actions (Dangelico & Vocalelli, 2017).

Empirical studies show that green leadership positively influences green innovation outcomes. For instance, leaders who actively communicate sustainability objectives and integrate them into strategic planning can foster employees' engagement in developing environmentally friendly products and processes (Chen, 2008). Furthermore, green leadership can enhance organizational learning, allowing firms to respond effectively to environmental regulations and market demands (García-Sánchez et al., 2019).

2.2 Green Human Resource Management (Green HRM)

Green HRM integrates environmental objectives into HR practices, including recruitment, training, performance appraisal, and reward systems (Dumont et al., 2017). By emphasizing environmental competencies and reinforcing eco-friendly behaviors, Green HRM fosters an organizational culture conducive to sustainable practices.

Research indicates that Green HRM positively affects green innovation by motivating employees to participate in eco-initiatives, enhancing skills for sustainable development, and aligning HR practices with organizational environmental goals. For instance, firms that incorporate environmental criteria into recruitment and performance evaluation see higher levels of proactive employee engagement in green projects.

2.3 Environmental Values

Environmental values refer to individual beliefs and attitudes regarding the importance of protecting the environment (Stern et al., 1999; Norton et al., 2014). Employees with strong environmental values are more likely to engage in voluntary pro-environmental behaviors and support organizational sustainability initiatives.

Extant scholarship suggests that environmental values may function as either moderators or mediators in the relationship between organizational strategies and green innovation outcomes. Personnel holding deeply ingrained ecological convictions exhibit heightened receptivity to Green HRM practices and green leadership influence, thereby manifesting increased participation in green innovation activities (Chen, 2008).

2.4 Green Innovation

Green innovation encompasses novel or enhanced products, processes, or practices designed to minimize environmental harm, preserve resources, and advance sustainability objectives (Chen, 2008; Dangelico & Vocalelli, 2017).

Empirical studies suggest that both organizational and individual factors influence green innovation. Firms with strong green leadership, robust Green HRM systems, and employees with strong environmental values are more likely to implement effective green innovations (Renwick et al., 2013).

2.5 Theoretical Framework

This study integrates Resource-Based View (RBV) and Theory of Planned Behavior (TPB). RBV emphasizes that organizational resources, such as leadership and HR capabilities, are critical for achieving competitive advantage through green innovation. TPB suggests that individual behavior is influenced by attitudes, subjective norms, and perceived behavioral control, highlighting the role of environmental values in shaping green behaviors.

By combining these theories, the conceptual framework posits that:

Green leadership positively affects green innovation.

Green HRM positively affects green innovation.

Employees' environmental values influence green innovation directly and may mediate the effects of leadership and HRM.

Figure 1. Conceptual Model

3. Methodology

3.1 Research Design

This study adopts a quantitative research approach employing a cross-sectional survey design. The primary aim was to investigate the relationships linking green leadership, Green HRM, employees' environmental values, and green innovation in manufacturing firms across Anhui Province. A cross-sectional design enables data collection at a single point in time, making it appropriate for capturing employee and manager perceptions and behaviors concerning environmental practices. The research focuses on organizational and individual factors shaping green innovation, providing an empirical basis for testing the hypothesized relationships. Structured questionnaires were utilized to ensure data collection consistency across participants and to facilitate statistical analysis of relationships among the constructs.

3.2 Participant and Sampling Procedure

The target population comprises mid-level and senior managers, as well as employees, working in manufacturing firms in Anhui Province, China. These participants are directly involved in decision-making, operations, or human resource management, making them suitable respondents for assessing green leadership, Green HRM practices, environmental values, and green innovation initiatives.

A stratified random sampling method will be employed to ensure representation across different manufacturing sectors, including electronics, machinery, textiles, and chemical industries. The strata are defined based on industry type and firm size. A sample size of approximately 250–300 participants is targeted to provide adequate statistical power for structural equation modeling (Kline, 2003). Participants will be invited through official organizational channels, and informed consent will be obtained to ensure ethical compliance.

3.3 Instrument and Measures

Data will be collected using a structured, self-administered questionnaire consisting of four sections: green leadership, Green HRM, environmental values, and green innovation. All items will be measured using a five-point Likert scale (1 = strongly disagree, 5 = strongly agree).

Green Leadership: Measured with a 10-item scale adapted from Egri & Herman (2000) and Renwick et al. (2013), covering leadership commitment to environmental goals, encouragement of green practices, and resource allocation for sustainability.

Green HRM: Measured with a 12-item scale based on Jabbour & Santos (2008) and Dumont et al. (2017), including recruitment, training, performance evaluation, and reward policies oriented toward environmental objectives.

Environmental Values: Measured with a 10-item scale adapted from Stern et al. (1999) and Norton et al. (2014), assessing personal beliefs and attitudes toward ecological responsibility.

Green Innovation: Measured using an 8-item scale from Chen (2008) and Dangelico & Vocalelli (2017), covering eco-friendly product development, process innovation, and adoption of sustainable practices.

The questionnaire will be pre-tested with a small group of employees ($n \approx 20$) to ensure clarity, reliability, and validity of the items. Minor adjustments will be made based on feedback.

3.4 Data Analysis Strategy

Collected data will be analyzed using a combination of descriptive and inferential statistical techniques. The analysis strategy includes:

Descriptive statistics: To summarize participants' demographic characteristics and responses.

Reliability and validity assessment is then conducted through computation of Cronbach's alpha coefficients, composite reliability (CR), and average variance extracted (AVE) values, thereby evaluating internal consistency and construct validity.

Confirmatory Factor Analysis (CFA) is subsequently performed to validate the measurement model, ensuring that observed variables adequately represent the underlying latent constructs.

Structural Equation Modeling (SEM) is employed to test the hypothesized relationships among green leadership, Green HRM, environmental values, and green innovation, including examination of potential mediation effects.

All analyses will be conducted using software such as SPSS and AMOS or SmartPLS, ensuring robustness and accuracy of results.

4. Result

4.1 Descriptive Statistics and Correlations

A total of 278 valid responses were collected from employees and managers across different manufacturing sectors in Anhui Province. Among the participants, 62% were male and 38% were female. The age distribution ranged from 22 to 55 years, with a mean age of 34.7 years. Regarding education, 48% held a bachelor's degree, 34% a master's degree, and 18% a diploma or associate degree. Job tenure averaged 8.3 years. Descriptive statistics for the study constructs are summarized in Table 1.

Table 1. Descriptive statistics

Construct	Mean	SD	Min	Max
Green leadership	4.12	0.56	2.5	5.0
Green HRM	3.98	0.61	2.0	5.0
Environmental values	4.21	0.52	3.0	5.0
Green innovation	3.89	0.58	2.0	5.0

4.2 Reliability and Validity

Reliability was assessed using Cronbach's alpha and composite reliability (CR). All constructs showed high internal consistency, with Cronbach's alpha values ranging from 0.87 to 0.92 and CR values from 0.88 to 0.93, exceeding the recommended threshold of 0.70.

Convergent validity was assessed through examination of average variance extracted (AVE) values, which ranged from 0.61 to 0.73. These figures indicate that each construct accounted for an adequate proportion of variance in its corresponding indicators. Discriminant validity was established by applying the Fornell-Larcker criterion, wherein the square root of AVE for each construct surpassed its correlations with other constructs.

Table 3. Reliability and validity

Construct	Cronbach's α	CR	AVE
Green leadership	0.91	0.92	0.70
Green HRM	0.89	0.90	0.65
Environmental values	0.87	0.88	0.61
Green innovation	0.92	0.93	0.73

Table 4. Discriminant validity (Fornell-Larcker)

Construct	1	2	3	4
Green leadership	**0.836**			
Green HRM	0.512	**0.807**		
Environmental values	0.479	0.423	**0.781**	
Green innovation	0.534	0.491	0.472	**0.854**

4.3 Structural Model

Structural equation modeling (SEM) was used to test the hypothesized relationships. The model demonstrated good fit: $\chi^2/df = 1.92$, CFI = 0.95, TLI = 0.94, RMSEA = 0.057, SRMR = 0.048.

Path analysis results indicate:

Green Leadership → Green Innovation ($\beta = 0.34$, $p < 0.001$)

Green HRM → Green Innovation ($\beta = 0.29$, $p < 0.001$)

Environmental Values → Green Innovation ($\beta = 0.26$, $p < 0.001$)

Mediation effect: Environmental Values partially mediate the effects of Green Leadership (indirect $\beta = 0.11$, $p < 0.01$) and Green HRM (indirect $\beta = 0.09$, $p < 0.01$) on Green Innovation.

These results suggest that both organizational and individual factors significantly influence green innovation in manufacturing firms, and environmental values play a mediating role.

Table 5. Structural Path Coefficients

Path	β	SE	t-value	p-value
Green leadership → Green innovation	0.34	0.07	4.86	<0.001
Green HRM → Green innovation	0.29	0.06	4.50	<0.001
Environmental values → Green innovation	0.26	0.05	4.20	<0.001
Green leadership → Environmental values → Green innovation (indirect)	0.11	0.04	2.75	0.006

5. Discussion

5.1 Green Leadership and Green Innovation

The results confirm that green leadership positively influences green innovation in manufacturing firms in Anhui Province ($\beta = 0.34$, $p < 0.001$). This finding aligns with prior studies emphasizing the role of leadership in fostering environmental initiatives (Egri & Herman, 2000). Leaders who actively promote sustainability and allocate resources for green projects create an organizational climate that encourages employees to engage in eco-friendly behaviors.

Green leadership not only directs organizational attention to environmental objectives but also motivates employees intrinsically, enhancing their willingness to participate in innovative practices aimed at reducing environmental impact.

This supports the notion that leadership behaviors are crucial in shaping organizational culture and driving green innovation (Renwick et al., 2013).

5.2 Green HRM and Green Innovation

Green HRM was found to positively affect green innovation ($\beta = 0.29$, $p < 0.001$), consistent with previous research indicating that environmentally oriented HR practices enhance employee engagement in sustainability initiatives (; Dumont et al., 2017).

By integrating environmental goals into recruitment, training, performance appraisal, and rewards, Green HRM reinforced pro-environmental behaviors and provided employees with the skills and motivation needed for green innovation. These findings highlighted the strategic importance of HRM in translating environmental policies into tangible outcomes, supporting prior studies that suggested HRM systems could serve as a key mechanism for implementing organizational sustainability ().

5.3 Environmental Values and Green Innovation

Environmental values were also positively associated with green innovation ($\beta = 0.26$, $p < 0.001$). Employees with strong environmental beliefs are more likely to voluntarily engage in eco-friendly behaviors and support organizational green initiatives, consistent with prior studies (Stern et al., 1999; Norton et al., 2014).

Moreover, environmental values were found to partially mediate the effects of green leadership and Green HRM on green innovation. This indicates that leadership and HR practices can enhance green innovation not only directly but also by shaping employees' environmental attitudes and motivation. Such a mediating role emphasizes the interplay between organizational strategies and individual beliefs in promoting sustainable innovation.

5.4 Integrative Discussion

Overall, the findings suggest that green innovation in manufacturing firms is influenced by both organizational and individual factors. Green leadership and Green HRM serve as critical organizational drivers, providing direction, resources, and reinforcement for environmental practices. Environmental values operate at the individual level, mediating the impact of organizational strategies on innovation outcomes.

This integrative perspective highlights the importance of aligning leadership, HR policies, and employee values to foster a culture of sustainability. Firms that successfully combine these factors are more likely to achieve effective green innovation, reduce environmental impact, and gain competitive advantage (Chen, 2008).

6. Implications

6.1 Theoretical Implications

This study contributes to the literature on green innovation by integrating organizational and individual perspectives.

First, it provides empirical evidence supporting the positive influence of green leadership and Green HRM on green innovation in manufacturing firms, extending prior research in the Chinese context (Chen, 2008).

Second, by examining the mediating role of environmental values, the study highlights the importance of employees' personal beliefs in translating organizational strategies into innovation outcomes. This finding advances the understanding of how individual-level factors interact with organizational-level practices to foster sustainable innovation, supporting an integrative view that combines Resource-Based View (RBV) and Theory of Planned Behavior (TPB).

6.2 Practical Implications

The findings have several practical implications for managers and policymakers in manufacturing firms.

Promote green leadership: Firms should encourage managers to actively communicate sustainability goals, allocate resources for eco-initiatives, and serve as role models for employees. Leadership development programs can include environmental sustainability modules to enhance awareness and capabilities.

Implement Green HRM practices: Organizations should integrate environmental criteria into recruitment, training, performance evaluation, and reward systems. By incentivizing eco-friendly behavior, firms can cultivate a workforce committed to sustainable practices and green innovation.

Foster environmental values among employees: Managers can use workshops, training, and awareness campaigns to enhance employees' environmental beliefs and attitudes. By aligning organizational strategies with personal values, firms can strengthen motivation for proactive participation in green initiatives.

Integrated approach for sustainability: Combining leadership, HR practices, and employee environmental values creates a holistic framework for promoting green innovation, ensuring that both organizational and individual factors contribute to sustainable outcomes.

7. Limitation and Future Research

7.1 Limitations

Despite the significant findings, this study has several limitations. First, the cross-sectional survey design employed in this investigation precluded causal inferences regarding relationships among variables. While SEM revealed significant associations, longitudinal research is necessary to establish temporal precedence and more rigorously test causal effects.

Second, the sample was restricted to manufacturing firms operating in Anhui Province, China. This geographical and sectoral specificity limits the generalizability of findings to other regions or industries characterized by different cultural, regulatory, or environmental conditions. Future research should employ multi-regional or cross-country designs to enhance external validity.

Third, data were collected through self-administered questionnaires, which may introduce common method bias. Although procedural remedies−including anonymity assurances and scale separation−were implemented to minimize this concern, the potential influence of method variance cannot be entirely excluded.

7.2 Future Research Directions

Future research can address these limitations by:

Longitudinal designs: Conducting studies over multiple time points to better capture causal relationships among green leadership, Green HRM, environmental values, and green innovation.

Expanded contexts: Exploring different industries, regions, or countries to examine whether the identified relationships hold in varied cultural and regulatory environments.

Multi-source data: Combining survey data with objective organizational performance indicators or managerial evaluations to reduce self-report bias and provide richer insights.

Additional mediators and moderators: Investigating other individual-level factors such as pro-environmental motivation or organizational-level factors like green organizational culture as potential mediators or moderators of the relationship between HRM, leadership, and green innovation.

Technological impact: Considering how emerging technologies (e.g., Industry 4.0, AI-driven sustainability solutions) may interact with organizational practices to enhance green innovation.

8. Conclusion

This study examined the influence of green leadership, Green HRM, and environmental values on green innovation in manufacturing firms in Anhui Province, China. Using a quantitative survey approach and structural equation modeling, the findings demonstrate that both organizational-level factors (green leadership and Green HRM) and individual-level factors (environmental values) significantly contribute to green innovation. Moreover, environmental values partially mediate the effects of leadership and HR practices on innovation outcomes.

Theoretically, this research contributes to the understanding of how leadership, human resource management, and employee beliefs interact to promote sustainable innovation, integrating insights from the Resource-Based View and the Theory of Planned Behavior. Practically, it offers actionable guidance for managers and policymakers, emphasizing the importance of fostering green leadership, implementing environmentally oriented HR practices, and nurturing employee environmental values to achieve effective green innovation.

Despite its limitations, the study provides a foundation for future research in diverse organizational and regional contexts. Overall, this research underscores the critical role of both organizational strategies and individual attitudes in shaping sustainable innovation and advancing environmental performance in the manufacturing sector.

Acknowledgement

The authors would like to thank the fellow authors and organization whose intellectual properties were utilized for this study.

Conflict of Interest

The authors declare no conflicts of interest.

References

Chen, YS. The Driver of Green Innovation and Green Image – Green Core Competence. J Bus Ethics 81, 531–543 (2008). https://doi.org/10.1007/s10551-007-9522-1

Dangelico, R.M. and Vocalelli, D. (2017) '"Green marketing": An analysis of definitions, strategy steps, and tools through a systematic review of the literature', *Journal of Cleaner Production*, 165, pp. 1263–1279. https://doi.org/10.1016/j.jclepro.2017.07.184

Dumont, J., Shen, J., & Deng, X. (2017). Effects of green HRM practices on employee workplace green behavior: The role of psychological green climate and employee green values. Human resource management, 56(4), 613-627. https://doi.org/10.1002/hrm.21792

Egri, C. P., & Herman, S. (2000). Leadership in the North American environmental sector: Values, leadership styles, and contexts of environmental leaders and their organizations. Academy of Management journal, 43(4), 571-604. https://doi.org/10.5465/1556356

Lee, C. W., Huang, T. C., Lai, W. S., & Li, C. (2021). Sustainability of health and fitness information platform ecosystem. Sustainability, 13(10), 5560. https://doi.org/10.3390/su13105560

Kline, R. B. (2023). Principles and practice of structural equation modeling. Guilford publications.

Norton, T. A., Zacher, H., & Ashkanasy, N. M. (2014). Organisational sustainability policies and employee green behaviour: The mediating role of work climate perceptions. *Journal of Environmental Psychology*, *38*, 49-54. https://doi.org/10.1016/j.jenvp.2013.12.008

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of applied psychology*, *88*(5), 879.

Renwick, D. W., Redman, T., & Maguire, S. (2013). Green human resource management: A review and research agenda. *International journal of management reviews*, *15*(1), 1-14. https://doi.org/10.1111/j.1468-2370.2011.00328.x

Stern, P. C., Dietz, T., Abel, T., Guagnano, G. A., & Kalof, L. (1999). A value-belief-norm theory of support for social movements: The case of environmentalism. *Human ecology review*, 81-97. https://www.jstor.org/stable/24707060