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Towards A Sustainable Public Sector: Exploring the Relationship Between Environmental Knowledge, Green HRM, and Performance

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ABSTRACT

Many firms adopted sustainability as a long-term organisation goal. To measure the goals, sustainable performance concept was adopted to measure the economic, social and environmental performance, which is a key for successful sustainable organisation. In the public sector, where decisions have wide-reaching societal implications, integrating environmental knowledge on the relationship between green human resource management (green HRM) and sustainable performance is essential. Green HRM integrates environmental strategy into human resource management strategy and policy as organisations recognise the pivotal role in fostering eco-friendly practices. A survey was conducted among leaders in Malaysia public sector organisations and structural equation modelling was employed for data analysis. Results reveal a positive association between environmental knowledge and green HRM adoption and achieved positive sustainable performance. The study contributes to the sustainable performance body of knowledge, offering practical insights for leaders, policymakers, and HR professionals especially in the public sector.

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1. Introduction

The journey towards sustainable development traces its roots back to the groundbreaking Brundtland Report, *Our Common Future*, published by the World Commission on Environment and Development (WCED) in 1987. This key document addressed pressing environmental challenges like global warming and the greenhouse effect. The WCED convened an international panel of experts to dissect the causes of these issues, intertwining the realms of social equity, economic growth, and the environment. Their collaborative effort aimed at formulating holistic policies that encapsulated these three pillars: environment, economy, and society.

Fast forward to the Earth Summit in 1992, where the concept of sustainable development gained further momentum. A significant leap occurred in 2015 during the United Nations General Assembly when member states collectively committed to the global goals, now known as the Sustainable Development Goals (SDGs). These 17 goals serve as strategic guides for addressing universal challenges like poverty, inequality, and overall quality of life. Unveiling a comprehensive framework, the SDGs comprise 169 targets and over 200 indicators, mobilizing entities from the public sector, private corporations, non-profit organisations, and individuals alike to actively contribute to the pursuit of sustainable development.

Strategically, the government aimed to maximize productivity for sustainable and inclusive growth. To achieve this, the public sector has incorporated green policies into operation activities. One primary example is implementing *Ekosistem Kondusif Sektor Awam* (EKSA), a quality management system that promotes a productive work environment while emphasising green practices and resource efficiency across the public sector organisations. The integration of sustainability into the core government operations could successfully achieved with green management practices. Therefore, the public sector should incorporate environmental consciousness into the HRM strategy, covering aspects like hiring, training, rewarding, and cultivating a green workforce, commonly known as green human resource management (Paillé et al., 2020). These integrations aim to foster awareness of environmentally friendly values, practices, and initiatives (Anwar et al., 2020). Moreover, by adopting such practices, the public sector can effectively contribute to environmental protection and gauge the overall sustainable performance of the organisation. Consequently, this study seeks to explore the impact of green human resource management practices on the sustainable performance of the public sector.

2. Literature Review

2.1 Sustainable Performance

The escalating interest in sustainable development has encouraged sustainable organisations to engage both internal and external stakeholders in shaping their business strategies and operations. Das and Singh (2016) explain that sustainable performance includes a comprehensive consideration of financial, sociological, and environmental implications. The exploration of sustainable performance has its roots in the early 2000s, coinciding with the emergence of the Triple-Bottom Line theory. This theory, introduced by Elkington (1998), advocates for a business approach that assesses and manages an organisation's outcomes in economic, social, and environmental dimensions. Elkington claims that the economic state of an organisation is intricately linked to its environmental impact. Consequently, a strong economic foundation enables businesses to invest in environmental and social domains, as discussed by Ong et al. (2019).

Social performance in the context of sustainable development involves assessing an organisation's impact on employees, customers, and stakeholders (Das & Singh, 2016). It encompasses various

dimensions such as employee well-being, community engagement, and societal contributions. This holistic approach emphasizes the importance of considering the social implications of business strategies and operations. Past study suggests that a positive social performance is closely linked to economic stability. Solid economic foundations enable organisations to invest in social initiatives, contributing to employee welfare and community engagement (Ong et al., 2019). However, Scholtens (2008) argues that a shift towards environmental activities, while beneficial for economic growth, may have implications for social performance. This highlights the need for a balanced approach that considers both environmental and social factors.

Another aspect of sustainable performance is environmental performance. Studies indicate that environmental performance can be measured at both individual and organisational levels (Anwar et al., 2020; Gilal et al., 2019; Guerci et al., 2016; Masri & Jaaron, 2017; Paillé et al., 2020). Individual environmental performance is influenced by factors such as awareness, intention to preserve the environment, environmental commitment, and environmental passion. These factors highlight the personal and attitudinal aspects that contribute to an individual's environmentally responsible behaviour. At the organisational level, environmental performance involves efforts to reduce environmental degradation and defend against resource abuse (Mohd-Yusoff et al., 2019). Organisations play a crucial role in implementing practices that promote sustainability, ranging from energy efficiency to waste reduction and responsible resource management.

Employee environmental performance is positively impacted when employees perceive strong organisational support for environmental initiatives (Pham et al., 2020). This underscores the importance of creating a supportive organisational culture that encourages and recognizes pro-environmental actions. Research also suggests that incorporating environmental considerations into organisational practices can lead to a balance between economic success and positive environmental outcomes. Efficient use of resources and commitment from employees and stakeholders contribute to adequate financial performance, showcasing the interdependence of economic and environmental dimensions (Kitzmueller & Shimshack, 2012). In a nutshell, recognizing the interconnected nature of economic, social, and environmental dimensions is essential for achieving a comprehensive and sustainable approach to organisational strategies and operations.

2.2 *Green Human Resource Management*

With the global shift toward sustainable development, human resource management has transformed into sustainable human resource management. The term green human resource management (green HRM) within the context of sustainable development encompasses various interpretations. It essentially refers to the organisational management processes designed to address environmental concerns (Guerci et al., 2016). Green HRM encompasses activities and practices aimed at cultivating a workforce with a green and environmentally friendly working style (Mehta & Chugan, 2015). In essence, green HRM utilizes human resource policies to enhance organisational efficiency across HR functions and practices (Dutta, 2012). Its overarching goal is to align staff with the organisation's environmental policy, making it a comprehensive approach. The primary objective of implementing green HRM is to elevate HRM by integrating environmental consciousness throughout the entire HRM process (Anwar et al., 2020).

Practically, adopting green HRM practices in an organisation yields various benefits. One key benefit is the reduction of office operating costs, achieved through sustainable use of resources like electricity, water, communication tools (internet and data usage), paper, and other operational materials. Additionally, organisations may qualify for tax reductions or incentives from the government, simultaneously enhancing their reputation (Yong, Mohd-Yusoff, Ramayah, et al., 2020). Besides, the green HRM offers work

efficiency with the support of advanced technologies, with paperless approaches such as posting job vacancies on the company website, conducting online meetings and interviews, and managing company correspondence digitally (Jerónimo et al., 2020). Moreover, integrating environmental in management can provide organisations with sustainable competitive advantages, leading to improved overall sustainable performance across environmental, financial, operational, and social dimensions (Yong, Mohd-Yusoff, Jabbour, et al., 2020).

Previous research has emphasized the pressing need to develop both theoretical and empirical measures of green HRM to gain deeper insights into its impact on individual and organisational performance (Arulrajah et al., 2015; Ren et al., 2017; Renwick et al., 2012). Scholars have taken the lead in developing such measures, exploring various contexts, including the use of the Ability-Motivation-Opportunity (AMO) theoretical framework to integrate green HRM into organisations (Eib et al., 2020; Gould-Williams & Gatenby, 2010; Kim et al., 2015; Renwick, 2013). This AMO theory suggests that HRM practices should focus on enhancing human capabilities, ultimately leading to improved organisational performance, such as increased output and reduced waste (Renwick et al., 2013). However, Renwick (2018) contends that for optimal sustainability, organisations must fully embrace the spectrum of green HRM activities. Hence, there is a need for further in-depth research on the effects of green HRM towards an organisation's sustainable performance.

2.3 *Environmental Knowledge*

Knowledge is the basis of effective human resource contributions to any organisation. As Bollinger and Smith (2001) suggest, knowledge is not only passively absorbed but it needs to be actively built upon personal experiences, skills, and competencies. This knowledge takes many forms, from general to highly specialized understandings of specific jobs, organisations, or even entire industries. Within this spectrum lies environmental knowledge, a critical element for driving sustainability.

Environmental knowledge encompasses not just an awareness of environmental issues, but also a comprehension of potential solutions and the interplay between human actions and ecological systems (Zsóka et al., 2013). It empowers individuals to become agents of positive change, equipping them with the skills and understanding needed to minimize negative environmental impacts.

This is particularly crucial within the public sector, where organisations are tasked with serving the common good and safeguarding the well-being of current and future generations. A workforce equipped with robust environmental knowledge is better positioned to develop and implement policies, programs, and services that promote environmental sustainability. However, simply having access to information is not enough. Research consistently highlights the link between environmental knowledge and pro-environmental behaviour. The more individuals understand environmental challenges, the more likely they are to adopt eco-friendly practices (Chan et al., 2014; Mostafa, 2007). Conversely, a lack of environmental knowledge can create significant barriers to sustainable behaviour, both at an individual and organisational level (Chan et al., 2014; Issock et al., 2019).

Therefore, fostering environmental knowledge within the public sector is not merely an option, but a necessity. By investing in educational initiatives and creating a culture that values environmental awareness, public sector organisations can empower their workforce to become true stewards of sustainability.

2.4 Hypothesis Development

The imperative for sustainable practices is increasingly recognized across industries, prompting organisations to explore innovative approaches to minimize their environmental footprint. Green human resource management has emerged as a strategic lever for driving organisational sustainability, embedding environmental considerations into the very fabric of HR policies and practices. This research proposed that environmental knowledge could mediate the relationship between green HRM and sustainable performance on four primary green HRM practices namely, green recruitment, green training, green compensation and rewards, and green involvement in examining their role in fostering a more sustainable future.

From the literature, past studies have discovered that environmental knowledge or awareness affects green recruitment and environmental performance. Roscoe et al. (2019) state that hiring environmentally conscious employees will promote environmental awareness across the various functions of the firm. Green recruitment will increase employees' environmental awareness and motivate them to apply their knowledge to improve organisational performance, which will lead to environmentally responsible behaviour in the workplace (Fawehinmi et al., 2020). However, the absence of appropriate knowledge on environmental concerns could cause employees to avoid pro-environmental behaviour and affect sustainable performance (Chan et al., 2014).

In addition to that, past researchers suggest that green training could improve an organisation's environmental performance while exerting environmental knowledge (Jabbour & Chiappetta, 2013; Teixeira et al., 2016). However, scholars argue that green training is not the only practice that could instil environmental knowledge; other practices can motivate employees to obtain knowledge through an attractive environmental performance management reward system (Yong et al., 2019). Fawehinmi et al. (2020) assured that environmental knowledge would influence the organisation's sustainable performance as when employees are more knowledgeable about the environment, they will commit to environmental initiatives. Employees will gain a better understanding of what to do and how to reduce environmental deterioration to become green advocates.

Furthermore, literature has revealed that other green HRM elements could drive employees' intent to participate in a green practice vitally crucial for the success of environmental programmes such as green rewards. Saeed et al. (2019) asserts that awarding employees who displayed excellent understanding and awareness of environmental issues with either financial or non-financial rewards and compensating them for their environmental performance would motivate other employees to engage in pro-environmental behaviours. In addition, such actions verified that green compensation and rewards help the organisation align its environmental strategies to obtain sustainability goals (Safari et al., 2018).

Finally, environmental knowledge serves as a mediator between green involvement and sustainable performance by enhancing the impact of employees' contributions toward environmental initiatives. Studies have shown that green employee involvement positively influences an organisation's sustainable performance and employee well-being (Guerci et al., 2016; Renwick et al., 2013). For example, employees engage in activities such as writing reports for internal and external audiences and forming green committees (Srivastava & Shree, 2019). This involvement helps organisations prioritize environmental goals and establish effective environmental management systems. However, if management lacks investment in programs that boost green involvement, its impact on sustainable performance may be limited (Jayabalan et al., 2020). To enhance employee interest and commitment, management should promote participation in environmental decision-making and problem-solving. Matthes et al. (2014) suggest that greater employee commitment to environmental protection activities leads to increased environmental responsibility and awareness, resulting in better performance. This aligns with Tang et al. (2018), who emphasized that green involvement, supported by knowledge enhancement, can improve an organisation's

environmental management quality. Ultimately, as environmental knowledge and awareness grow, green involvement gains value and further strengthens overall environmental performance.

Based on these considerations, this research hypothesizes that environmental knowledge could mediate the relationship between green HRM and the public sector's sustainable performance. By acting as a conduit, environmental knowledge bridges the gap between the adoption of green HRM and the achievement of sustainable outcomes. Thus, the following hypothesis is established:

H₁: Environmental knowledge mediates the relationship between green HRM and sustainable performance.

3. Methodology

3.1 *Research Design and Sample*

A correlational research design was used to assess the influence of green HRM on sustainable performance. Focusing on Malaysia's public sector including federal, state, and local government tiers, the research population includes over 500 government agencies and public sector organisations listed in the Malaysian Administrative Modernization and Management Planning Unit (MAMPU). G-Power was utilised to determine the sample size. Using purposive sampling, selected elements was chosen based on specific criteria that is, offering civil service to the public, responsible and implementing sustainability programs, and independently managing HR functions. The unit of analysis is the organisational level, with one manager representing each organisation.

3.2 *Measurement*

This study used an online survey questionnaire to collect data. To ensure quality and reduce potential bias, the questionnaire combined items from established research, utilizing multi-item scales with multiple variables and indicators. Sustainable performance was measured using a questionnaire developed by Gelhard, & Von Delft (2016) which encompasses environmental, economic, and social performance dimensions. Seven-point Likert scale was used to measure the items. Meanwhile, the measurement for green human resource management, was adapted from Masri & Jaaron, (2017), Renwick et al. (2013), and Ooi et al., (2017) whose items are grouped into four categories namely, green recruitment, green training, green compensation and rewards, and green involvement. A five-point Likert scale was used to evaluate each item, with responses ranging from strongly disagree to strongly agree. Lastly, three items of environmental knowledge were adopted from Fawehinmi et al. (2020) using a five-point Likert scale ranging from (5) strongly agree to (1) strongly disagree to answer each item.

4. Findings

4.1 *Response Pattern*

Response Pattern

A survey has been conducted to measure sustainable performance in the public sector in Malaysia. One hundred sixty-seven respondents from various government agencies in Peninsular Malaysia, Sabah, and Sarawak participated in this study. Table 1 shows the response pattern according to the state of Malaysia.

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The result shows that most respondents were from government offices (N=154, 92.2%) which included the federal, state and local government offices, and the remaining were from statutory bodies (N=13, 7.8%). In terms of locality, most data were collected from Sarawak (N=32, 19.2%), followed by Pulau Pinang (N=19, 11.4%), Pahang (N=18, 10.8%), Perak (N=14, 8.4%), Selangor (N=14, 8.4%), Kelantan (N=12, 7.2%), Terengganu (N=11, 6.6%), Negeri Sembilan (N=9, 5.4%), Sabah (N=9, 5.4%), Kedah (N=8, 4.8%), Johor (N=6, 3.6%), Putrajaya (N=5, 3.0%), Melaka (N=4, 2.4%). The least responses received are from Kuala Lumpur and Perlis (N=3, 1.8%) respectively.

Table 1. Survey Response Pattern

		Frequency (N)	Per cent (%)
Organisation Category	Government	154	92.2
	Statutory Bodies	13	7.8
Total		167	100
State	Johor	6	3.6
	Kedah	8	4.8
	Kelantan	12	7.2
	Kuala Lumpur	3	1.8
	Melaka	4	2.4
	Negeri Sembilan	9	5.4
	Pahang	18	10.8
	Perak	14	8.4
	Perlis	3	1.8
	Pulau Pinang	19	11.4
	Putrajaya	5	3.0
	Sabah	9	5.4
	Sarawak	32	19.2
	Selangor	14	8.4
Terengganu	11	6.6	
Total		167	100

4.2 Common Method Bias

The statistical tool SmartPLS 4 (Ringle et al., 2022) was utilized for structural equation modelling to assess both the measurement and structural model. This approach was selected because it does not require the assumption of normality, which is often suitable for survey research as such data typically do not follow a normal distribution (Chin et al., 2003). Since the data was collected from a single source, we initially tested for Common Method Bias by evaluating full collinearity, following the guidelines of Kock and Lynn (2012). In this method, each variable is regressed against a common factor, and if the Variance Inflation Factor (VIF) value is below 3.3, it indicates that single-source bias is not present. As shown in Table 2, the VIF values were all below 3.3, indicating that single-source bias is not a significant concern for our data.

Table 2. Full Collinearity Testing

GR	GT	GCR	GIV	EnK
2.688	3.183	2.823	2.741	2.201

Note: GR = Green Recruitment, GT = Green Training, GCR = Green Compensation and Rewards, GIV = Green Involvement, EnK = Environmental Knowledge

4.3 Measurement Model

For the measurement model, we assessed the loadings, average variance extracted (AVE) and the composite reliability (CR). The values of loadings should be ≥ 0.5 , the AVE should be ≥ 0.5 and the CR should be ≥ 0.7 . Table 3 shows the results of the convergent validity assessment. The findings present that the AVEs are all higher than 0.5 and the CRs are all higher than 0.7. The loadings were also acceptable with all loadings more than 0.708 (Hair et al., 2019).

Table 3. Convergent Validity

Constructs	Items	Loadings	AVE	CR
Green Recruitment	GR1	0.793	0.705	0.922
	GR2	0.778		
	GR3	0.880		
	GR4	0.885		
	GR5	0.855		
Green Training	GT1	0.869	0.804	0.930
	GT2	0.878		
	GT3	0.901		
	GT5	0.857		
Green Compensation and Rewards	GCR1	0.796	0.700	0.942
	GCR2	0.815		
	GCR3	0.811		
	GCR4	0.866		
	GCR5	0.847		
	GCR6	0.876		
	GCR7	0.840		
Green Involvement	GIV1	0.846	0.726	0.941
	GIV2	0.818		
	GIV3	0.874		
	GIV4	0.851		
	GIV5	0.866		
	GIV6	0.857		
Environmental Knowledge	EnK1	0.902	0.844	0.942
	EnK2	0.936		
	EnK3	0.918		
Sustainable Performance	SPer1	0.855	0.804	0.953
	SPer2	0.922		
	SPer3	0.871		
	SPer4	0.922		
	SPer5	0.910		

Note: Item GT4 was deleted due to low loadings.

Then, we assessed the discriminant validity using the HTMT criterion suggested by Henseler et al. (2015) and updated by Franke and Sarstedt (2019). The HTMT values should be ≤ 0.85 the stricter criterion and the mode lenient criterion is it should be ≤ 0.90 . Referring to Table 4, the values of HTMT were lower than the stricter criterion of ≤ 0.85 as such we can conclude that the respondents understood that the constructs are distinct. Taken together both these validity tests have shown that the measurement items are both valid and reliable.

Table 4. Discriminant Validity (HTMT)

	Environmental Knowledge	Green Human Resource Management	Sustainable Performance
Environmental Knowledge			
Green Human Resource Management	0.668		
Sustainable Performance	0.708	0.803	

4.4 Structural Model

We assessed multivariate skewness and kurtosis following the guidelines of Hair et al. (2017) and Cain et al. (2017). The analysis indicated that the collected data did not fulfil the conditions for multivariate normality, as evidenced by Mardia's multivariate skewness ($\beta = 3.784$, $p < 0.01$), and Mardia's multivariate kurtosis ($\beta = 41.827$, $p < 0.01$). Consequently, we applied a 10,000-sample bootstrapping method to report the path coefficients, standard errors, t-values, and p-values for the structural model (Ramayah et al. 2018). Furthermore, in line with Hahn and Ang's (2017) argument that p-values alone are insufficient for evaluating the significance of a hypothesis, they suggested using a combination of p-values, confidence intervals, and effect sizes. Table 5 shows the summary of the criterion we have used to test the hypothesis developed. The result demonstrates that the relationship between Green HRM \rightarrow EnK \rightarrow SP ($\beta = 0.410$, $p = 0.00$) has shown that the relationship is significant, which aligns with the confidence interval that does not include zero (LL = 0.310, UL = 0.516). Thus, the hypothesis is supported.

In addition, Table 6 shows the result for the effect size (f^2), in which environmental knowledge possesses a substantial effect ($f^2=0.755$) towards sustainable performance, while Green HRM ($f^2=0.640$) has a medium effect towards sustainable performance. In summary, Figure 1 shows the structural model of this study.

Table 5 Summary of Hypothesis Testing

Relationship	Std Beta	Std Error	t-values	BCI LL	BCI UL	p-values	Decision
Green HRM \rightarrow Environmental Knowledge \rightarrow Sustainable Performance	0.410	0.053	7.749	0.310	0.516	0.00	Significant

Table 6 The Effect Size

	f^2	p-value	Effect Size
EnK \rightarrow SP	0.755	0.000	Substantial
GHRM \rightarrow EnK	0.640	0.000	Medium

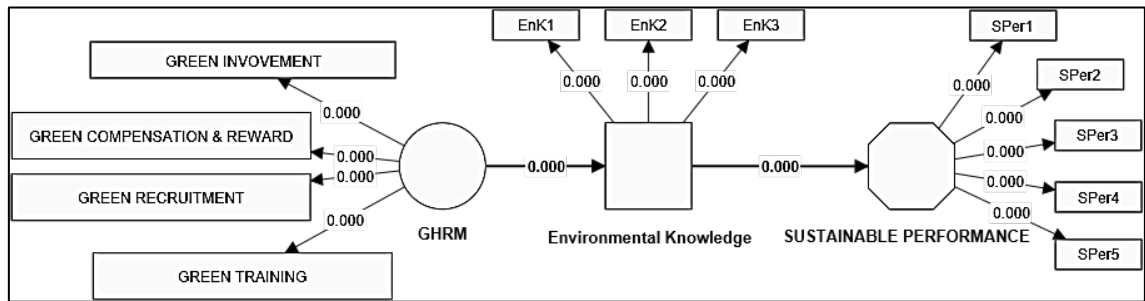


Figure 1. Structural Model

5. Discussion

The findings of this research reveal that green HRM significantly enhance sustainable performance of Malaysia's public sector ($p = 0.000$). The positive result of green HRM on sustainable performance can be attributed to several factors. First, posting job vacancy through company websites, job portals and conducting interviews online could reduce recruitment cost and time effectively. This result support the notion by Prathima and Misra (2013), assert that with advanced technologies, green recruitment could decrease operational cost and offer less impact on the environment. Second, eco-friendly training programs foster an environmentally conscious workforce, equipping employees with the skills and knowledge to contribute to sustainability initiatives (Morgan & Rayner, 2019). These programs not only promote energy conservation and waste reduction but also encourage sustainable commuting options, further advancing organisational sustainability.

Third, green compensation and rewards can enhance employees willingness to practice environmental initiatives (Renwick et al., 2013). These practices can be further enrich with communication, feedback and employee empowerment (Govindarajulu & Daily, 2004). Furthermore, green HRM practices also act as a catalyst for innovation within the public sector. By encouraging employees to engage with and propose sustainable practices, organisations can generate creative solutions that reduce the environmental impact of government operations (Liu et al., 2020). This approach cultivates a culture of environmental responsibility, positioning the public sector as a leader in sustainability efforts.

This study also highlights the mediating role of environmental knowledge. The result evidenced that environmental knowledge successfully mediates the relationship between green HRM and sustainable performance in the Malaysian public sector. The results confirmed the significant relationship between green HRM, environmental knowledge, and sustainable performance ($\beta = 0.410$, $p = 0.00$). Additionally, environmental knowledge showed a substantial effect on sustainable performance ($f^2 = 0.755$), while Green HRM had a medium effect ($f^2 = 0.640$), highlighting the critical role of environmental knowledge as a mediator.

The findings emphasize the importance of environmental knowledge in enhancing sustainable performance through green HRM, particularly in the public sector. Management and policymakers should consider enforcing green HRM practices to promote sustainability at organisational levels to national levels. Public sector organisations, with their role in policymaking and strategy development, are uniquely positioned to influence sustainability at both an organisational and societal level (Huy and Phuc, 2020; Hashim et al., 2016). By integrating environmental considerations into HR practices, these organisations can drive sustainable performance, aligning with broader social, economic, and environmental objectives.

Although the positive points mentioned above are present, this study has some limitations. The study focused on the Malaysia's public sector that restricts the generalizability of results to other sectors or countries. Future studies may include the effects of green HRM on sustainable performance in other contexts like non-profit organisations or the private domain. Moreover, longitudinal studies can reveal more profound insights about the long-term influence of green HRM practices. The other way which would give us a better understanding of the context of this study would be a focus group interview.

6. Conclusion

In conclusion, this study confirms that environmental knowledge is a vital link between Green HRM practices and sustainable performance in the public sector. By embedding this knowledge into how organisations manage their people, we see a real impact not just on how the organisation operates internally, but on its broader commitment to sustainability. Essentially, when employees are equipped with the right environmental understanding, they are better able to contribute to meaningful changes that promote sustainability.

The findings highlight an interesting opportunity for public sector organisations to lead by example. With their significant role in shaping policies and strategies, these organisations can set the benchmark for sustainability by incorporating eco-friendly practices into their HR processes. Whether it is promoting remote work to cut down on emissions or providing eco-awareness training to staff, the potential benefits are clear, that is a more sustainable workplace and a team of employees who feel empowered to make a difference.

Moreover, the public sector's role goes beyond improving internal operations, it extends to influencing other sectors and the general public to follow. As public organisations align their HR practices with environmental goals, they help pave the way for wider adoption of sustainability initiatives. By doing so, they not only enhance their performance but also contribute to the nation's larger sustainability efforts. Ultimately, Green HRM is not just about organisational benefit, but also about cultivating a mindset where innovation, sustainability, and responsibility become part of the work culture. This approach drives public sector organisations to achieve balanced, long-term success while actively contributing to global efforts in environmental protection.

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Conflict of interest statement

The authors confirm that this research was carried out without any personal, commercial, or financial conflicts of interest. They also declare that there are no conflicting interests with the funders involved in this study.

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