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The impact of implementing green human resources practices on employee engagement sustainability

N. Razali, H. Vasudevan*

Tun Razak Graduate School, University Tun Abdul Razak, Malaysia

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ABSTRACT

BACKGROUND AND OBJECTIVES: Malaysia's food and beverage industry provides a diverse range of regional and global cuisines, reflecting the country's diverse population. Profit, the development of new products, customer and employee satisfaction, and the sustainability of employee engagement have an impact on an organization's productivity. Positive attitudes towards green human resources management—which encompasses green hiring and selection, green training and development, and green remuneration and reward—are a sign of engaged employees. Businesses in this industry found it difficult to retain employees due to insufficient green hiring and selection procedures, inadequate training and development programs, and insufficient compensation and benefits. This research examines the relationship between green training and development, green recruitment and selection, and green compensation and reward for employee engagement and sustainability in the Malaysian food and beverage industry.

METHODS: For this investigation, the quantitative method was used to analyze information using IBM SPSS software version 26. The objective was to improve the industry's efficient functioning for long-term growth. A total of 210 surveys were distributed to Klang Valley workers in this industry using convenience sampling and a non-probability sampling approach. Taro Yamane's approach was used to calculate the sample size. Convenience sampling is a non-probability sampling technique where sample units are selected based on their accessibility to the researcher.

FINDINGS: As a result, all three variables- green training and development, green recruitment and selection, and green compensation and reward- have a positive and significant relationship with employee engagement sustainability. The hypotheses have been accepted with a p-value ranging from 0.000 to 0.236. In the case of hypothesis 1, there is a positive correlation ($r = 0.760$, $p \leq 0.01$) between green training and development and employee engagement sustainability. Similarly, hypothesis 2 shows a positive correlation with a significant p-value of 0.236 between green recruitment and selection and employee engagement sustainability. Hypothesis 3 also indicates a significant correlation ($r = 0.762$, $p \leq 0.01$) between green compensation and reward and employee engagement sustainability.

CONCLUSION: The study provides empirical evidence and conceptual proof that the establishment and management of a fund designed to promote the development of human resources within a specific jurisdiction are governed by the Pembangunan Sumber Manusia Berhad Act of 2001. The interaction between this act and Green Human Resource Management may differ depending on the specific laws and policies of a country or region. Organizations can utilize funds from the Human Resource Development Corps to carry out projects related to Green Human Resource Management, such as eco-friendly training and development courses. Green Human Resource Management seeks to support environmental responsibility and sustainability initiatives.

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*Corresponding Author:

Email: hemaloshinee@unirazak.edu.my

Phone: +60126281490

ORCID: [0000-0002-2767-8044](https://orcid.org/0000-0002-2767-8044)

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INTRODUCTION

The food and beverage industry is one of the sectors that has a high demand during the COVID-19 pandemic because people need to consume nutritious food to increase their body's resistance to maintaining health (de Souza *et al.*, 2022) so the Ministry of Industry assessed the food and beverage industry as one of the manufacturing sectors that must be protected to continue to develop positively during the COVID-19 pandemic. The positive growth of the food and beverage industry sector is a momentum that must be maintained and increased so that it can consistently make a significant contribution to the national economy (Muslih, 2021; Stamopoulos *et al.*, 2024). It's been a challenging time for employees and employers, as the COVID-19 pandemic has impacted most organizations. During these difficult times, organizations need to establish strategies that keep people engaged and productive. However, it is the biggest challenge that relates to employee engagement sustainability in the workplace (Chen *et al.*, 2023; Jain *et al.*, 2024). Organizations must develop effective strategies to sustain their employees after being impacted financially, specifically in the Food and Beverage (F&B) industry. So, the F&B sector has struggled with sustainability in recent decades (Norizan *et al.*, 2022). The pandemic has caused the food and beverage industry to be negatively impacted since 2020 by the effects of the economic downturn. A significant number of workers, especially those with more experience, will quit, and companies risk losing their competitive advantage if they are reluctant to locate a replacement with equivalent qualifications. Over the past 20 years, many academic studies have focused on sustainability because it is an important long-term objective for organizations (Kavadis *et al.*, 2023) in all industries. However, in the modern era, the goal of employee engagement sustainability should be to positively impact "sustainable development by delivering simultaneously economic, social, and environmental benefits—the so-called triple bottom line (Pontecchiani, 2023). Long-term employee engagement is hard to establish and maintain without good Green Human Resources Management (GHRM) practices (Vahdati and Vahdati, 2018). Thus, it is proposed that by comprehending the breadth and depth of GHRM practices, organizations will be able to operate in a more ecologically responsible manner than they ever have before.

Green Human Resource Management (Green HRM) is a contemporary management concept designed to impact employees' environmentally conscious behaviors, claim to Dixit (2022). Hence, Wisetsri *et al.*, (2023) highlighted that Green HR is the application of HRM techniques to enhance the practical utilization of assets within commercial organizations and, on a broader scale, advances the cause of environmental sustainability. Thus, sustaining employees in the Food and Beverage industry is critical to ensuring long-term business performance. The study aims to determine if Malaysian food and beverage companies can utilize factors that contribute to the long-term engagement of their employees. While retention is critical for success and creating a positive work culture, cultivating long-term employees will propel the company forward as their experience grows. This study can be used as a baseline for examining the impact of the Food and Beverage industry on employee sustainability as the industry grows and companies face numerous challenges as a result of COVID-19. To promote long-lasting employee engagement, companies can incorporate novel ecological methods that harness their workforce's talents and innovative approaches to tackling environmental performance concerns. This approach refers to promoting green human resources, and it helps organizations achieve confirmed sustainability (Chams and García-Blandón, 2019). Implementing green Human Resource Management can ensure the success of an organization's environmental performance, which plays an essential role in developing organizational sustainability (Pham *et al.*, 2020). Low morale, high turnover rates, and decreased productivity are all consequences of persistent low employee engagement that can have a detrimental financial impact on the business (Al-Suraihi *et al.*, 2021). The challenge of maintaining employee engagement and productivity while implementing green human resources management arises from the need for businesses to use environmentally friendly procedures (Pham *et al.*, 2020). According to Aggarwal *et al.* (2015), the researcher reviewed prior research and found that while some scholars have examined the significance of GHRM in the food and beverage industry, there is still a gap in this sector due to improper implementation of Green HRM practices and a lack of awareness among most employees. Since it explains how human resource

management policies work, the ability-motivation-opportunity theory and contingency theory is a key theoretical gap in green HRM that affects employee engagement sustainability at the organizational level (Yu *et al.*, 2020), which has shown that one of the best green human resources management strategies for ensuring the ongoing development of green management in most organizations is green training and development. This study filled a vacuum in the literature by reviewing sustainability-related aspects of employee engagement thoroughly and concentrating on recent research utilizing social exchange theory, social identity theory, and Gallup theory from a sustainability perspective. Prior analyses (Barney *et al.*, 2021; Nayak *et al.*, 2023) of organizational sustainability across various domains or industries mainly relied on theories such as resource dependency, social exchange, dynamic capability, resource-based view, and so forth. This is because employees and managers themselves are not aware of the benefits and best practices to achieve employee sustainability (Vanisri and Chandrapadhy, 2024). To summarize, sustainable employee engagement through Green Human Resource Management is a critical issue that organizations must address to achieve their sustainability goals while maintaining employee productivity and engagement. The study also offers insightful information on the significance of GHRM, which will be helpful for researchers, trainers, aspiring business owners, policymakers, and the government to take significant steps toward green Human Resource Management to sustain employee engagement. GHRM and sustainability business in the palm oil industry (Hendarjanti, 2022); GHRM and work employee engagement in the manufacturing industry (Stalin *et al.*, 2024); GHRM in driving green work engagement and green employee performance in the manufacturing industry (puspa Gustiah *et al.*, 2023); GHRM on employee green behavior and green work engagement in higher education (Aboramadan, 2022); and GHRM and green employee engagement in the automotive industry (Subburao *et al.*, 2023). As a result, the study has filled gaps in many industries. The body of knowledge determines Green Human Resource Management practices—green training and development, green recruitment and selection, or green compensation and rewards have the greatest influence and fill the gap in sustainability employee engagement in the Food & Beverage Industry among

employees in Malaysia in 2023.

Literature review

In today's corporate environment, environmental management has gained more significance, as it is crucial for maintaining employee engagement and business sustainability. Many businesses have adopted the concept of GHRM in their HR departments. It is worth noting that some businesses in both developed and developing countries have integrated GHRM policies into their strategic plans. They strive to achieve sustainable long-term development. One of the key advantages of implementing GHRM in the food and beverages sector is the ability to heighten employee awareness, organizational innovation, and employees' innovation to sustainability and commitment to environmental management issues. In the context of organizational and employee perspectives, employee-driven innovation toward sustainability is an organizational change driven by ideas from employees in an organization. Changes that occur in the organization with new technological changes in the company, not only that, new skills in handling technology and thoughtful, creative ideas in the company's service because it encourages customers about a company's service. All types of innovation changes such as products, services, technologies, and markets will be considered employee-driven innovation (Tajpour *et al.*, 2018) toward sustainability if those who produce those products meet the criteria of who does and breaks paradigms and routines. HRM has an essential role within an innovation strategy, as it can, together with other areas, create, develop, and maintain actions that support and recognize innovative ideas and encourage employees to become actively engaged with the inclusion of innovation in their daily work lives (Azevedo *et al.*, 2021). Engagement in innovation has focused mainly on R&D (research and development)-based innovation, innovation created by experts, consumer innovation, and technology-based innovation (Kandampully *et al.*, 2023). There are many reasons why political, financial, and research institutions should devote more attention to the role of employee-driven innovation toward sustainability (Carlbäck *et al.*, 2023). Innovation toward sustainability can be conceptualized by comparing the concept with concepts related to non-R&D innovation (Lu *et al.*, 2024), non-technological innovation (Turci

et al., 2021), green HRM (Boominathan *et al.*, 2024), green transformation (Wang *et al.*, 2024), high-engagement innovation (McCool *et al.*, 2020), and direct participation in organizational change to sustain the organization's strategy and process (Bhat *et al.*, 2024; Opazo-Basáez *et al.*, 2024). Implementing good human resource management practices can enhance employee competence, innovation, and motivation leading to employee engagement sustainability. It has led to a positive impact on the financial performance of the company. GHRM involves incorporating environmental management principles into HRM activities, starting with recruitment and continuing through performance management, training and development, employee relations, compensation, rewards, and exits. A top building block of green human resource management is the ability-motivation-opportunity theory. This theory explains how policies related to human resource management can impact employee engagement and sustainability at the organizational level. A study by Yu *et al.*, (2020) found that implementing continuous green management and training programs is key for effective green human resource management in organizations. Employing green training and development techniques can be a means of fostering in employees a green mindset regarding the relevance of employee engagement sustainability (Moradeke *et al.*, 2021). Therefore, companies are beginning to recognize the value of green recruitment and selection. It is recommended that talent recruiters use a systematic, multidisciplinary approach to assessing talent (Larkin and O'Connor, 2017). Web-based recruiting provides recruiters with more information about their environmental practices than traditional channels such as brochures or newspaper ads (Renwick *et al.*, 2013). The study conducted by Masri and Jaaron (2017) found that implementing green recruitment and selection practices has a direct impact on sustainability. Previous research (Yong *et al.*, 2020) has shown a strong positive correlation between implementing GHRM practices and achieving favorable organizational and environmental outcomes. Employees demonstrating a commitment to eco-friendliness should be rewarded for environmental conservation efforts (Tulsi *et al.*, 2020). Organizations can implement many reward systems to improve employee motivation and learning skills, ultimately enhancing sustainability (Rahim *et al.*,

2018). These rewards not only show appreciation for workers but also incentivize participation in eco-friendly initiatives and practices. Presbitero (2017) discusses the need for literature to explore the relationship between human resource practices and employee engagement. Alnaqbi (2011) conducted a study to investigate the relationship between human resource practices and employee engagement. The study found no significant correlation between the two variables. Green HR practices have positive impacts on business, society, and the environment. Government agencies enforce green protection laws by recommending such practices. Organizations must adopt green HR practices to address environmental concerns and foster a responsive workforce through strategic planning.

Hypothesis and theoretical foundation

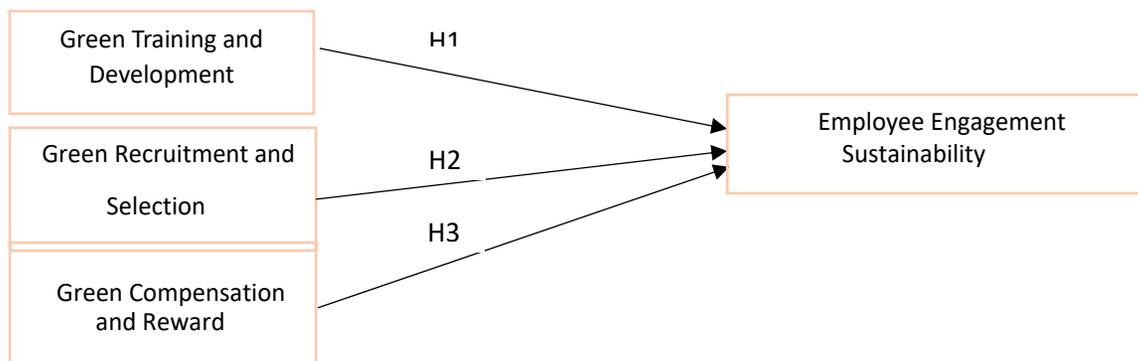
Analytical framework

The following hypothesis is developed based on a review of the literature and the previous discussion on the conceptual model of the impact of GHRM and employee engagement sustainability. So hypothesis 1 supported the relationship between Green training and development and employee engagement sustainability in the Malaysian food and beverages Industry. A study (Alam *et al.*, 2023) claims that utilizing green training and development strategies can help cultivate in workers a green perspective on the importance of sustainability in employee engagement. Employee engagement is a crucial aspect of sustainable development, and various approaches can be considered to achieve this. Creating ad hoc strategies, policies, and processes is one way to promote sustainability in the workplace. It's essential to have a well-rounded approach that considers the needs of the employees and the organization. From the talent management viewpoint, companies provide employees with various opportunities to enhance their skills, knowledge, and expertise. These opportunities include training and development, recruitment and selection, compensation, and reward. It's a mutually beneficial exchange where the employees gain valuable experience while the company benefits from their improved performance (Raza *et al.*, 2023). For instance, GHRM practices, such as green training, can increase employees' knowledge and proficiency in sustainability, but this may not be sufficient to inspire employees to sustain

(Raza *et al.*, 2022). Hypothesis 2 indicates that green recruitment and selection is supported toward employee engagement sustainability in the Malaysian food and beverage industry. It is recommended that talent recruiters use a systematic, multidisciplinary approach to assessing talent (Larkin and O'Connor, 2017) because green recruitment and selection have a significant impact on employee work sustainability (Stalin *et al.*, 2024). Moreover, hypothesis 3 showed that green compensation and reward are positively correlated with employee engagement sustainability in the current study due to theories such as the Social Exchange Theory (SET), Social Identification Theory, and Gallup Theory framework would aid in comprehending how GHRM is linked to employee engagement sustainability (Ari *et al.*, 2020). It seems like (Rahim *et al.*, 2018) have identified different reward systems that organizations can utilize to enhance skill acquisition and encourage employees to work towards achieving sustainability goals. It's interesting how organizations can use incentives to motivate employees to contribute towards a common objective. It was inferred from Fig. 1 that Green Human Resources practices significantly impact employee engagement sustainability. The framework incorporates various theories and concepts, including green training and development, green recruitment and selection, and green compensation and reward. The framework highlights the crucial role of GHRM practices in promoting employee engagement sustainability. Fig. 1 illustrates how Green Human Resources practices affect employee engagement sustainability.

The Social-Exchange Theory (SET) framework is widely recognized as a prominent theory that elucidates

the impact of green HR practices on sustainability outcomes related to employee engagement. This theory can be applied to comprehend the GHRM conceptual model. Organizations are constantly seeking a theoretical foundation for solutions; the social exchange theory plays a crucial role and aids in the theoretical perspective to address organizational conflicts (Kundi and Manipal, 2023). Suleman *et al.*, (2023) argued that implementing green HRM practices can reduce employee turnover rates, leading to increased employee retention rates and promoting sustainability. As illustrated in Fig. 1, GHRM indicators encompass green training and development, green recruitment and selection, and green compensation and reward. Having a proper GHRM (Green Human Resource Management) system in place is crucial because the successful implementation of environmental management systems requires effective human resource practices. As per the research conducted by Xie (2023) and Lau (2023), it has been identified that the integration of GHRM with environmental management systems can lead to better outcomes and sustainable business practices. According to the Social Identification theory, green human resource initiatives that improve employees' skills and motivation for work lead to positive performance outcomes (Karatepe and Karadas, 2012). Additionally, this approach can cultivate an environment where employees and the company engage in a mutually beneficial exchange of information, leading to increased employee engagement and motivation (Ahmeti, 2023). According to the Social Exchange Theory (SET), social interactions are focused on sharing resources, such as love, support, and material goods. The encouragement



Figs. 1: Conceptual model of the correlation between GHRM practices and employee engagement sustainability

of employee engagement sustainability may increase employees' willingness and capacity to act sustainably (Harrach *et al.*, 2020). This statement highlights the impact of organizational management on employee engagement sustainability. It suggests that the way organizations manage themselves and profit from them affects the level of employee engagement. The statement also implies that employee engagement is a two-way process that involves a benefit exchange between an employer and an employee. This idea is supported by Qadri and Bilal (2022). The Gallup model played an essential role in developing employee engagement, which has had a significant impact on the company's growth prospects. This impact encompasses aspects such as loyalty, high earnings per share, morale, open systems, financial well-being, brand image, favorable results, higher staff productivity, support for positive interpretation, essential change management, and sustainability (Shahzad *et al.*, 2023). Food and beverage businesses are increasingly mindful of employee engagement sustainability. And green management in today's cutthroat industry (Alyahya *et al.*, 2023).

MATERIALS AND METHODS

Survey design and data collection

The quantitative method has been employed in developing this study because participants could fill out the questionnaires at their own pace. The data collected from the respondents were analyzed by using a variety of tests and measures using IBM SPSS software version 26 (Karbassi and Pazoki, 2015). Inferential statistics were used as predictive methods to compare the study sample data to other samples or previous research to establish the validity of the variables. The study's assessment tools were chosen and designed with the study's goals. The study used content validity and construct validity as instruments for instrument creation and measurement. The operational definition of the study was used as the basis for construct validity, while the study's scope, objectives, and content determined the validity of the content. Given these considerations, the measurements used in this investigation are reliable. This study had little interference. This study is conducted in a non-contrived study setting, which means there will be no control over the degree of researcher intervention. This study applied a cross-sectional time horizon, in which information is

primarily obtained at one time via a questionnaire to obtain measurable parameters associated with the dependent variable and independent variables (Doering *et al.*, 2020). This descriptive study explains how certain variables relate to one another (Loewenthal *et al.*, 2020). Deductive reasoning is employed in this study to test an established theory based on earlier research (Markovits *et al.*, 2018). Deductive reasoning is helpful when conducting quantitative research because it enables the creation of hypotheses based on previous studies and the execution of hypothesis tests using the collected data (Brisson and Markovits, 2020). After gathering data, a hypothesis test is carried out to evaluate the validity of the hypothesis using precise and accurate data (Anderson, 2000). According to the Annual Economic Statistic 2022 in the food and beverages industry by the Department of Statistics Malaysia (DOSM), the food and beverage industry employed in Klang Valley had 400,078 employees in 2023. The reason why this study is conducted in the food and beverages industry is due to its global relevance, economic significance, complexity, innovation, social impact, and career opportunities, the food and beverage industry presents a fascinating and multifaceted subject of study and can also help address its problems and shape its future. This particular study has made use of non-probability convenience sampling to gather data. For non-probability sampling, the sample size is determined using Taro Yamane's formula $n = N / (1 + Ne^2)$, where n represents the required sample size, while N represents the population size. For large populations, the researcher increased the sample size to 210 respondents to achieve a reliability level of 95% with an error rate of 0.05.

$$n = 400,078 / (1 + 400,078(0.05)^2)$$

$$n = 400,078 / (1 + 400,078(0.0025))$$

$$n = 400,078 / (1 + 1000)$$

$$n = 400,078 / 2000$$

$$n = 200$$

This study used self-administered online questionnaires, in which respondents will have access to a browser site to complete the survey at their convenience and uninterrupted. Both primary and secondary sources are used to gather data; primary sources with a social focus, such as focus groups and questionnaires, may be preferred; secondary sources can be found in publications, reports, and other sources. The general structure

Table 1: Result of the respondent's profile

Demography variables	n	%
Gender		
Male	98	46.7
Female	112	53.3
Race		
Malay	180	85.7
Indian	8	3.8
Chinese	18	8.6
Others	4	1.9
Age		
18 - 24 Years	24	11.4
25 - 34 Years	68	32.4
35 - 44 Years	82	39.0
45 - 54 Years	29	13.8
Above 55	7	3.3
Education		
Malaysia Certificate Level (SPM)	45	21.4
Diploma	55	26.2
Degree level	78	37.1
Master / PhD level	20	9.5
Others	12	5.7
Position in Organization		
Top Management	12	5.7
Managerial Level	51	24.3
Executive Level	78	37.1
Non-Executive Level	69	32.9
Top Management	12	5.7
Experience in organization		
Less than 2 years	44	21.0
2 – 5 years	62	29.5
6 – 10 years	46	21.9
Above 10 years	58	27.6

of the questionnaire is straightforward and appealing, with a suitable introduction, clear guidelines, and a well-structured questionnaire. A questionnaire measurement method will be using a 5 Likert scale in this study. This method is used to reflect the compatibility between the items and responses. The value of (5) refers to the 'strongly agree' response level and the value of (4) refers to the 'agree' response level. Meanwhile, the value of 3 refers to a 'neutral' response level, a value of (2) a 'disagree' response level and a value of (1) a 'strongly disagree' response level. The questionnaire is divided into three sections Part A, B, and C. Questions in Part B, Part C, Part D, and Part E are related to green human resources management, which includes green training and development, green recruitment and selection, and green compensation and reward.

RESULTS AND DISCUSSION

Descriptive statistics and analysis for variables entering the analysis

A total of 210 survey questionnaires were returned by respondents, with a response rate of 100%. Table 1 shows that descriptive analysis results indicate that out of the respondents, 112 (53.3%) were female, while 98 (46.7%) were male. The frequency distribution and percentage of respondents based on gender are shown in Table 1. It can be concluded that there are more female respondents compared to male respondents, with a difference of 14 individuals. Table 1 analysis revealed that of the 180 respondents, 85.7 percent were of Malay ethnicity, followed by 18 (8.6%) Chinese, 8 (3.8%) Indian, and 4 (1.9%) other ethnic groups. In Malaysia, the majority of workers in the food and beverage sector are members of the Malay ethnic group. Regarding age distribution, the

Table 2: Result of the reliability and validity analysis

Indicator	No.of items	items	Cronbach Alpha	Factor Loading
Understanding of Green Human Resources Management	6	My employer's procedures Green HRM practices. Employees at my company are given green goals to work towards. My organization offers its staff members opportunities for green training and growth to encourage environmental ideals. My organization provides its staff with environmentally focused training to improve the knowledge and abilities needed for green management. My employer associates green workplace practices with benefits and income. In my organization, hiring and selection procedures are correlated with green workplace practices.	0.939	0.870
Green Training and Development	6	My company provides sufficient training to emphasize green management as a fundamental organizational value. My company takes into account an employee's eco-friendliness as part of their development assessment to sustain the employee in the organization. Employees gain a comprehensive understanding of the green human resources management policy during the training My company offers employees opportunities to receive training in environmental aspects. My company performs training needs analysis to determine the specific training needed for improvement of job satisfaction. The staff gets internet access to all training materials.	0.946	0.903
Green Recruitment and Selection	6	I believe the company incorporates Green Recruitment and Selection elements within its recruitment strategy. I believe the company takes into account candidates who displaying interest in and concern for environmental criteria I believe the company communicates its policies for environmental sustainability during the recruitment process. I am aware that the manager informed all employees that the company was seeking prospective candidates with environmental management competencies. I am aware that to retain personnel, the company uses environmentally friendly recruitment and selection procedures. In my opinion, the organization considers how environmental management and personal identity mesh during the hiring and selection process.	0.945	0.916
Green Compensation and Reward	6	I am aware that the company practices Green compensation and rewards. My company offers incentives (such as stock options, additional leave days, coupons, etc.) to employees for	0.901	0.836

Continued Table 2: Result of the reliability and validity analysis

Indicator	No.of items	items	Cronbach Alpha	Factor Loading
		participating in sustaining and engaging employees in eco-friendly practices activities within the organization. Employees are rewarded financially for their performance. Incorporating environmentally-conscious compensation and rewards systems will result in long-lasting employee engagement Engaging in green compensation and rewards practices motivate me to remain with the organization. Green compensation and rewards can enhance a company's efforts to implement sustainable practices.		
Employee Engagement Sustainability	6	My company motivates me to go beyond what I would do in a similar role elsewhere. Employee engagement sustainability is a significant factor for me when choosing which company to work for. I am aware of an employee engagement policy on sustainability. Employee engagement sustainability is key to engaging the workforce of the future. I am satisfied with the opportunities available in the company to utilize my skills and talents. I am satisfied with the company's stance on sustainability, based on the effectiveness of its engagement process.	0.928	0.893

study's findings indicate that 82 respondents (39%) within the 35 -44 years old, followed by 68 (32.4%) within the 25-34 years age range, followed by 45-54 years old, 18-24 years old were 24 (11.4%), and another 7 respondents (3.3%). It can be observed that most respondents within 35-44 years old. Meanwhile, 62 respondents (29.5%) have been working within 2-5 years in the food and beverages industry in Malaysia, 58 (27.6%) respondents working for more than 10 years in the organization, followed by 46 (21.9%) respondents have been working within 6-10 years and 44 (21%) respondents less than two years working in the organization. According to Table 1, the majority of respondents were at the executive level, with 37.1% of them holding this position. Non-executive level employees made up 32.9% of the respondents, while 24.3% were at the management level, and only 5.7% were in the Top Management category. The high number of executives may be due

to the degree level education requirement for this position, which is also reflected in the education level results.

Reliability and validity analysis

The validity and reliability of an instrument are crucial to maintaining the accuracy of the instrument and preventing it from being exposed to errors (Cheraghipoor et al., 2024). The higher the validity and reliability of an instrument, the more accurate the data obtained, resulting in a good and high-quality study (Samimi and Nouri, 2023). The following are the Cronbach's Alpha values for this research instrument as shown in Table 2. The closer the value of Cronbach's Alpha is to 1, the higher the reliability level (Bougie et al., 2019). While the reliability value for Cronbach's Alpha greater than 0.3 is considered good, greater than 0.5 is better, and greater than 0.7 is strong (Shrestha, 2021). Overall, this research

Table 3: Normality Test (Skewness and Kurtosis)

	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Std. Error
B_Understanding_HRM	-.511	.168	.238	.334
C_Green_Training_Development	-.605	.168	.448	.334
D_Recruitmen_N_Selection	-.395	.168	.013	.334
E_Compensation_N_Reward	-.786	.168	1.448	.334
F_Employee_Engagement_Sustainability	-.567	.168	1.034	.334

Table 4: Correlation analysis

---The definition??	GTD	GRS	GCR	EES
Green training development	1	.873**	.822**	.760**
Green recruitment and selection	.873**	1	.856**	.743**
Green compensation and reward	.822**	.856**	1	.762**
Employee engagement sustainability	.760**	.743**	.762**	1

** . Correlation is significant at the 0.01 level (2-tailed).

Table 5: ANOVA Test

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	77.763	3	25.921	121.127	.000 ^b
Residual	44.084	206	.214		
Total	121.847	209			

instrument has a high level of reliability, i.e., $\alpha = 0.95$.

Normality Test

Table 3 demonstrates how the study used skewness and kurtosis to evaluate the data’s normalcy. Skewness and kurtosis in a normal distribution are predicted to be 0. Values of kurtosis and skewness between -1 and +1 are regarded as acceptable. The computed skewness and kurtosis values, as displayed in Table 3, are within this typical range, suggesting that the data is appropriate for additional examination.

Correlation Analysis

Davis (1971) defined a strong correlation as having a correlation coefficient of 0.70 or higher and a good correlation range of 0.50-0.69. Table 4 presents the study’s findings, which show a strong correlation between employee engagement and sustainability and green HRM practices (recruitment and selection, training and development, and compensation and reward). In particular, the results show that green recruitment and selection and employee engagement and sustainability are significantly correlated ($r = 0.743, p \leq 0.01$) and that there is a significant and high relationship between green training and development

and employee engagement sustainability ($r = 0.760, p \leq 0.01$). In addition, there is a noteworthy and robust correlation between green compensation and reward and employee engagement sustainability ($r = 0.762, p \leq 0.01$). The study finds that there are strong and significant correlations between the following GHRM practices: Green Recruitment and Selection and Green Training and Development ($r = 0.856, p \leq 0.01$), Green Training and Development, and Green Compensation and Reward ($r = 0.822, p \leq 0.01$), and Green Training and Development and Green Training and Development ($r = 0.873, p \leq 0.01$). The positive correlation between the variables indicates their strength and direction.

Multiple regression analysis

It is evident from Table 5 that the combination of these three independent variables has a noteworthy effect on the sustainability of employee engagement. The findings show that the independent variables collectively explain 63.3% of the variation in employee engagement sustainability that has been observed. This regression is significant, as seen in the table below [F (206=121.12, P<0.05).

The findings are presented in Table 6, the results of

Table 6: Summary of discussion findings

Hypothesis	Decision	Results
H1: Green training and development and employee engagement sustainability are correlated.	Positive (p-values= .000)	Hypothesis Accepted
H2: Green hiring and selection practices and sustainable employee engagement are correlated.	Positive (p-values= .236)	Hypothesis Accepted
H3: Green compensation and reward and employee engagement Sustainability are correlated.	Positive (p-values= .000)	Hypothesis Accepted

the study analysis indicate that all three variables have a positive relationship, and all of them are significant. It aligns with earlier research findings (Abualigah *et al.*, 2023), which substantiate the positive correlation between GHRM and green creativity.

The hypothesis analysis for the study is presented in Table 6. Among the three variables, Green Compensation and Reward have the highest impact on the sustainability of employee engagement. Based on the findings of H1, there is a significant relationship between Green Training and Development and employee engagement sustainability in the Malaysian food and beverage industry with a significant p-value of .000. There is a positive correlation between Green Training and Development and Employee Engagement Sustainability ($r = 0.760$, $p \leq 0.01$). Moreover, this discovery is in line with the Social Identity Theory (SIT), which posits that employees who identify with a “green” organization (made possible by GHRM) are more inclined to support and participate in environmental initiatives within that organization. Offering green training can improve employees’ skills and knowledge (skill-enhancing), promote employee engagement in sustainable initiatives (opportunity-enhancing), and link employee rewards and compensation to green behaviors (motivation-enhancing) are likely to encourage employees to generate innovative and valuable green ideas and solutions to achieve environmental objectives. Farooq *et al.*, (2021) suggest that incorporating green training, restructuring performance evaluations, rewards, compensation, and promotion criteria around employees’ eco-friendly behavior can improve the Food and Beverage Industry’s green innovation. The findings also indicate a positive correlation between Green recruitment and selection and employee engagement sustainability in the Malaysian food & beverages industry, with significant p-values of .236 for hypothesis 2. According to

correlation analysis, there is a significant correlation between Green Recruitment and Selection (GRS) and employee engagement sustainability. The correlation coefficient (r) is 0.743, with a p-value of ≤ 0.01 . The social exchange theory is used to examine GRS. This theory focuses on the relationships and interactions between individuals and organizations. In the context of GRS, the social exchange theory helps to explain the dynamics between organizations and potential employees concerning environmental responsibility and sustainability. Aligning green recruitment and selection practices with environmental responsibility and sustainability can lead to positive perceptions, trust, and commitment from candidates. Ultimately, this contributes to the success of the organization. There is a strong relationship ($r = 0.762$, $p \leq 0.01$) between green compensation and reward, employee engagement, and sustainability (H3). Compensation and rewards that promote environmentally friendly practices are crucial in fostering sustainable employee engagement. They not only incentivize employees but also align their values with those of the organization, creating a culture of sustainability. It leads to increased participation in sustainability initiatives, resulting in positive environmental and sustainability outcomes for the organization.

Practical and theoretical implication

GHRM empowers managers to shape employees’ perspectives on sustainability, foster support for environmental quality, and enhance organizational performance. Organizational management places a heightened focus on GHRM functions, particularly within the realm of green human resource recruitment and selection. This emphasis aims to enhance the social and environmental performance of the organization by aligning recruitment and selection processes with the strategic green objectives of the organization. This approach ensures the hiring of

employees who possess green values and behaviors. Organizations that embed sustainability capabilities are also more likely to develop monitoring capabilities to support the development of sustainable products and processes. As noted by Adams *et al.*, (2023), organizations in the food and beverage industry are more likely to realign their strategies toward social responsibility. Therefore, management should prioritize monitoring capabilities that enable them to seize opportunities in both the external and internal environments, thus advancing their corporate social performance from a sustainability perspective in a developing country context. From a broader perspective, the study's findings support corporations in addressing the extensive Sustainable Development Goals agenda, particularly regarding sustainable consumption and production through the adoption of GHRM practices. Additionally, the study underscores the importance of developing sustainability-oriented capabilities in various industries, including textiles, pharmaceuticals, manufacturing, chemicals, and automobiles. It aligns with Malaysia's environmental policy objectives, aimed at conserving the country's environment and enhancing the overall quality of life. As a result, this study is significant because it provides a valuable framework for understanding the dynamics of organizational sustainability. It recommends management make hiring environmentally conscious workers and acquiring monitoring capabilities top priorities for a corporate strategy to meet social equality and environmental conservation goals.

Limitations and future research

It is essential to recognize the limitations of this study, which only focuses on the food and beverages sector in Malaysia. Future research could involve comparing sustainable performance across different service sectors and industries, not just food and beverages. Additionally, the constructs could be measured as higher-order variables in subsequent studies. There are limitations in this study, such as the sample size of respondents, the methods used, and the demographics selected by the researcher in the study are limited. Like the study conducted by the researcher, its limitations are confined to only a few indicators in Green Human Resources. The second limitation is that the study was conducted using quantitative methods. Third, the sample of respondents was drawn from F&B industry employees

in the following locations: (a) Kuala Lumpur and (b) Selangor. As a result, people working in different places may have varied experiences. Fourth, the study did not specifically categorize the employees' skills of working in the F&B industry. It would be beneficial to adopt a comprehensive GHRM bundle approach in the future study that includes all GHRM practices to evaluate their impact on employee engagement sustainability.

CONCLUSION

This study emphasizes the influential role of a company in developing ethical HR practices. It proposes the adoption of GHRM as a long-term managerial framework that prioritizes talent retention and motivation and aligns the organization's strategy with economic, social, and environmental considerations. Implementing sustainable GHRM practices in the food and beverage industry can have a positive impact. Organizational culture benefits from employee engagement through job security, work-life balance, and self-responsibility. It is crucial to carry out additional research on green HR initiatives in the Malaysian food and beverages industry. It will enable all organizations to implement the practices of GHRM effectively. It will require presenting the information in a way that is easily understandable by Human Resource Officers who play a critical role in the organization's operations. Additionally, the development of an evolved GHRM framework model can be considered as a vehicle for a more holistic evaluation of employee engagement sustainability. Sustainability employee engagement and GHRM may contribute to the development of an effective organizational culture, job security, health promotion, flexibility, participative leadership, a value-added economy, self-responsibility, and work-life balance. Furthermore, GHRM empowers managers to shape employees' perspectives on sustainability, foster support for environmental quality, and enhance organizational performance. The *Pembangunan Sumber Manusia Berhad (PSMB) Act 2001*, which may be in place in some countries, is commonly referred to as the Human Resources Development (HRD) Corporation and is associated with the Green Human Resources Management (GHRM) strategy. A legal framework known as the *PSMB Act 2001* controls the creation and management of a fund intended to assist in the advancement of human resources within

a particular jurisdiction. The Government of Malaysia required the extension of the PSMB Act 2001 with effect from March 2021 in its 11th Malaysia Plan (11MP), which falls under Strategic Thrust 5 - Focus Area C: Strengthening Lifelong Learning for Skills Enhancements. It involves opening up HRD Corp's resources, initiatives, and services to all sectors of the economy. The fund gathered under the PSMB Act 2001 was used to provide training, education, and skill development programs for the employees. The connection between Green Human Resource Management (GHRM) and the PSMB Act 2001 can vary depending on the specific policies and regulations of a given country or region. Organizations can use funds from HRD Corps to implement environmentally friendly training and development programs that align with the sustainability and environmental responsibility objectives promoted by GHRM. It is important to note that the relationship between GHRM and PSMB Act 2001 would be subject to the legal and regulatory framework of the specific jurisdiction in which an organization operates.

AUTHOR CONTRIBUTIONS

N. Razali performed the literature review, experimental design, analyzed, and interpreted the data, and H. Vasudevan prepared the manuscript text and manuscript edition. N. Razali and H. Vasudevan performed the experiments and literature review, compiled the data, and manuscript preparation. N. Razali and H. Vasudevan performed and compiled the data analysis and findings for the manuscript edition.

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ABBREVIATIONS

<i>AVE</i>	Average Variance Extracted
<i>EES</i>	Employee Engagement Sustainability
<i>GHRM</i>	Green Human Resource Management
<i>GTD</i>	Green Training and Development
<i>GRS</i>	Green Recruitment and Selection
<i>GCR</i>	Green Compensation and Rewards
<i>HP</i>	Hypothesis
<i>p-value</i>	Probability value
R^2_{adj}	Adjusted coefficient of determination
R^2	Coefficient of determination
<i>r</i>	Pearson correlation coefficient
<i>r-value</i>	Pearson correlation coefficient
\bar{Y}	Average of observed data
α	Level of significance

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