



Antecedents and Outcomes of Sustainable Human Resources Management: A Meta-Analytic Approach

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Abstract

Sustainable Human Resource Management (SHRM) serves as a pivotal driver of corporate sustainability performance by integrating ecological, social, and economic values into core HRM systems. Effective implementation of sustainable HR practices requires identifying the key antecedents and outcomes that influence these practices. This study conducted a comprehensive meta-analysis of the antecedents and outcomes of SHRM, employing quantitative, meta-analytical techniques. The research population comprised prior scholarly works—articles and theses—from Iran and other countries between 2000 and 2024. From 29 qualified studies, relevant variables were extracted and analyzed using CMA2 software to determine effect sizes. The findings demonstrated that environmental factors represented the strongest antecedents (effect size = 0.756), with additional environmental dimensions (0.584) also exerting substantial influence. Of the eight antecedent categories, corporate social responsibility exhibited a small effect size, whereas engagement, HR maturity, strategic orientation, and high-performance work systems reflected moderate effects. Conversely, leadership style, social capital, and institutional pressures produced strong effects. Regarding the twenty-five outcomes, customer satisfaction and limited employability skills had small effect sizes. Moderate outcomes included employee behavior, job pursuit intention, sustainability orientation, and innovation performance. Strong outcomes encompassed prosocial and helping behaviors, empowerment, commitment, participation, turnover intention, social sustainability, social capital, organizational attractiveness and support, employee retention, citizenship behavior, economic sustainability, organizational resilience, environmental sustainability, and environmental performance. Overall, the results underscore that environmental factors are among the most decisive elements shaping sustainable HRM practices. Organizations must therefore integrate environmental considerations into strategic human resource planning to enhance holistic sustainability and long-term resilience.

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Introduction

Over the past two decades, the global focus on sustainability has intensified, prompting the widespread adoption of sustainable practices across industries and sectors. Mounting concerns over environmental degradation, the marginalization of social groups, anti-capitalist movements, and the drive toward innovation and cleaner production have positioned corporate sustainability as both an organizational imperative and a global priority. Originating from the active environmental movement, the concept of sustainability has evolved into a defining slogan of the twenty-first century (Tooranloo et al., 2017: 1252).

In Europe and the United States, sustainability discourse has undergone significant transformation since the eighteenth century, particularly within forestry management. A major milestone occurred in 1987 when the United Nations Brundtland Commission articulated the seminal definition of sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Jandaghi et al., 2023: 44). The terms *sustainability*, *sustainable development*, *corporate sustainability*, and *corporate social responsibility* are frequently used interchangeably (Arman et al., 2016: 116). Collectively, sustainability encapsulates three interrelated dimensions—environmental, social, and economic. Social sustainability emphasizes the well-being and equity of current and future generations; environmental sustainability focuses on safeguarding ecosystems and reducing adverse environmental impacts; and economic sustainability stresses prudent resource management to secure long-term productivity and prosperity (Tooranloo et al., 2017: 1253–1254).

By the late 1990s, research across environmental studies, organizational behavior, and corporate sustainability began highlighting the pivotal role of human resource management (HRM) in advancing sustainability. This intersection led to the emergence of a transformative paradigm—*Sustainable Human Resource Management* (SHRM)—grounded in resource-based theory. SHRM represents a strategic approach that integrates economic, social, and environmental objectives into HRM systems and practices (Ahmadzadeh Shokooh, 2020: 156). Sustainable HR practices not only enhance organizational profitability but also mitigate negative impacts on employees, their families, and surrounding communities (García-Cruz et al., 2024: 1). Crucially, SHRM ensures the alignment of human resource strategies with broader sustainability goals, embedding specific HR sustainability objectives within the organizational strategic framework (Mushtaq and Akhtar, 2024: 713).

Sustainable Human Resource Management (SHRM) embodies an organizational commitment to sustainability through the fair, ethical, and impactful management of human capital, fostering a holistic sustainability mindset across the workforce (Mushtaq & Akhtar, 2024: 713). From Faisal’s perspective (2023), SHRM represents an integrative approach that aligns traditional HRM functions with corporate sustainability, ensuring that environmental objectives are embedded within broader organizational goals (Faisal, 2023: 1–2).

Various scholarly definitions of SHRM can be classified into three conceptual categories. (a) Reproducibility: emphasizing economic continuity and sustainable competitive advantage that transcends internal HRM policy impacts through economic and social dimensions. (b) Promotion of social and environmental health: focusing on the external implications of HRM practices, including environmental stewardship and social welfare. (c) Interconnections: highlighting bidirectional relationships between HRM functions and organizational results. Despite nuanced terminology, these perspectives universally position human and social factors at the core of organizational success and survival (Ghaleh Aghababaei, 2023: 258).

Within the SHRM framework, several sub-concepts emerge: Green HRM, Socially Responsible HRM (SRHRM), Common Good HRM, and Triple Bottom Line HRM—a model integrating internal and external organizational perspectives with economic, environmental, and social objectives



(Piwowar-Sulej, 2024: 2; Cosenza et al., 2024: 131). Green HRM prioritizes environmental responsibility through eco-conscious HR policies and practices. SRHRM reflects employee-centred corporate social responsibility by ensuring ethical working conditions. Human Resource Management for the Common Good combines both employee- and environment-centric goals, advancing organizational and societal well-being (Piwowar-Sulej, 2024: 2).

In pursuit of competitive advantage, many firms are implementing sustainability management systems. Their success, however, depends on strategic human resource engagement (Cachón-Rodríguez et al., 2022: 2). As the foundation of organizational capabilities, employees continuously refine their skills and effectiveness—prompting companies to invest in workforce development initiatives (Almarzooqi et al., 2019: 1272). A major challenge in this process is cultivating sustainability-oriented strategies and employee engagement as mechanisms for inclusive capacity building—ensuring that *no one is left behind* (Cachón-Rodríguez et al., 2022: 1). Overcoming these challenges requires recognizing and understanding the factors that influence the success of SHRM.

Among these antecedents, leadership plays a pivotal role in driving sustainable performance. Traditional leadership models often lack alignment with sustainability objectives, whereas emerging paradigms—such as *authentic*, *servant*, and *responsible leadership*—offer ethical and socially mindful guidance for embedding sustainability across organizations (Nakra & Kashyap, 2024: 2). Responsible leaders, by effectively managing stakeholder relationships, foster equitable value creation that enhances not only organizational outcomes but also systemic sustainability (Nakra & Kashyap, 2024: 3).

Institutional pressures also significantly influence SHRM. Institutional theory suggests that organizations are situated within regulatory and normative environments that dictate legitimacy and conformity. Institutionalization often drives organizations to adopt sustainability practices—sometimes through imitation of best practices or compliance with governmental directives—even when efficiency is uncertain. This structural conformity reflects a quest for legitimacy shaped by societal expectations (García-Cruz et al., 2024: 2). Consequently, external pressures, legal mandates, and social norms serve as strong motivators for the adoption of SHRM.

Another key antecedent is the implementation of High-Performance Work Systems (HPWS)—comprehensive HRM structures designed to foster superior organizational and financial performance. These systems, often referred to as *high-involvement* or *high-commitment management*, emphasize job security, flexible work arrangements, fair grievance procedures, and motivating compensation frameworks (Mariappanadar & Kramer, 2014: 208). Central to HPWS is employee participation—in decision-making, access to strategic information, and involvement in organizational processes—which creates transparent, sustainable workplaces (Mariappanadar & Kramer, 2014: 208).

Furthermore, organizational strategy aligns long-term sustainability goals with HRM capabilities, ensuring that the direction and scope of operations satisfy stakeholder expectations while preserving resources for future generations (Poorahmadi et al., 2022: 115). Corporate Social Responsibility (CSR) likewise contributes to SHRM, functioning as a supportive framework that strengthens employee motivation and commitment toward sustainability. CSR enhances recruitment and retention of sustainability-oriented talent and encourages their involvement in environmental and social initiatives (Yusliza et al., 2019: 2062).

The successful execution of SHRM also depends on organizational maturity and social capital development—the creation of ethical, spiritual, and humanistic environments that foster trust and collective purpose. Without these foundational elements, the transition toward sustainable HRM remains incomplete (Arman et al., 2016: 120).

Beyond antecedents, extensive research has established that SHRM generates numerous positive organizational outcomes (Almarzooqi et al., 2019: 1273). According to Social Exchange Theory, sustainable HRM practices enhance employee voice behaviors (expressing constructive concerns),



knowledge sharing, and helping behaviors—all of which strengthen cooperative engagement between employees and employers. These exchanges operate on the principle of mutual benefit, where perceived organizational support and fairness reinforce sustainable commitment (Aboramadan et al., 2022: 1791).

Organizational Support Theory further explains the SHRM-outcomes relationship: employees' perception of organizational care and empathy directly influences their motivation to reciprocate through sustainable behavior. When sustainability initiatives are perceived as genuine rather than symbolic, the resulting trust amplifies engagement, retention, and performance (Almarzooqi et al., 2019: 1277).

In sum, Sustainable Human Resource Management transcends traditional HRM by embedding long-term environmental, social, and economic commitments into its core philosophy. Its effectiveness depends on an intricate balance of leadership ethics, institutional dynamics, strategic vision, social responsibility, and cultural maturity—positioning human capital not merely as a resource, but as the central driver of enduring sustainability.

The implementation of Sustainable Human Resource Management (SHRM) significantly enhances organizational attractiveness, making companies more appealing to potential employees. Organizational attractiveness reflects the emotional and attitudinal perceptions individuals hold toward an organization as a desirable place to work (Chaudhary, 2020: 203). Rooted in *social identity theory*, this concept suggests that individuals form part of their self-concept through association with social groups; thus, employment in sustainability-oriented organizations fosters pride and self-enhancement among potential recruits. Such attractiveness positively correlates with a candidate's intention to pursue career opportunities within the organization (Ibid.: 204).

Sustainability also generates broader behavioral and social outcomes, notably strengthening *corporate social responsibility* (Pashazadeh & Behrooz, 2024) and *organizational citizenship behavior* (Hooi et al., 2022). Empirical evidence from numerous studies supports these links. For instance, Arman et al. (2016), in their study "*The Impact of Social Capital and Human Resource Maturity on Sustainable Human Resource Management*" within Iran's petrochemical sector, found that social capital and HR maturity exert a significant positive influence on sustainability. Similarly, Ahmadzadeh & Shokooh (2020) revealed that social capital indirectly promotes innovation and citizenship behavior via SHRM among employees of the National Oil Products Distribution Company.

In the municipal waste management sector, Poorahmadi et al. (2022) identified leadership style and organizational strategy as key antecedents of SHRM, with performance, attractiveness, engagement, and turnover representing its main consequences. Unlike that organization-specific focus, the current research provides a comprehensive meta-analysis of all relevant studies published from 2000 onward. Hamzevi et al. (2023), studying staff in Salman Farsi Hospital (Bushehr), demonstrated that SHRM strongly influences employee retention and moderately impacts social capital. In small and medium enterprises, Pashazadeh & Behrooz (2024) confirmed SHRM approaches as pivotal enablers of social responsibility development.

Further international evidence reinforces these conclusions. In the United Arab Emirates, AlMarzooqi et al. (2019) examined SHRM within the oil and gas industry and found significant direct effects on sustainable employee performance and perceived organizational support, with *knowledge sharing* and *empowerment* acting as mediators. In India, Sharma et al. (2022) reported that sustainable HR practices markedly enhance employability skills in the technology sector. Within Brazil's chemical industry, García-Cruz et al. (2024) established that institutional pressures shape SHRM practices and that organizational interactions mediate this relationship. Likewise, Nakra & Kashyap (2024) observed that *responsible leadership* has a direct effect on organizational sustainability performance, which is further reinforced by SHRM's mediating role among India's leading firms.

Globally, an international survey covering 2,800 companies found that 70% have integrated sustainability into daily operations and strategic planning (Seyed Nadimi et al., 2020: 105). Despite this



advancement, literature indicates that comprehensive models for SHRM remain underdeveloped (Seyed Nadimi et al., 2020: 106). Most prior studies have explored only limited variable sets, leaving the *antecedent–consequence structure* largely opaque to scholars. As emphasized by Ghaleh Aghababaei (2023: 258), the absence of clarity regarding SHRM's inputs and outputs renders the field a “black box” and hinders meaningful progress in human resource sustainability.

To bridge this gap, the present research undertakes a meta-analytical investigation integrating findings from diverse studies to systematically discern the antecedents and consequences of Sustainable Human Resource Management. Through quantifying effect sizes and cross-context comparisons, the study seeks to determine the relative importance and priority of these variables across different organizational and national settings. In line with this objective, the central research question is defined as follows:

“What are the antecedents and consequences of Sustainable Human Resource Management?”

Materials and methods

This research is a fundamental quantitative study employing a meta-analytical approach. Meta-analysis is a scientific method that synthesizes data from multiple primary studies to address a unified research question and generate comprehensive, evidence-based conclusions (Ghorbani Zadeh, 2018: 155). Data collection was conducted through extensive library research and the examination of quantitative studies related to Sustainable Human Resource Management (SHRM). The research population comprised academic publications—articles and theses—produced between 2000 and 2024. The year 2000 marks the period when SHRM began to be systematically studied as an innovative concept in human resource management (Faisal, 2023: 4). Sources include both domestic and international databases, notably: Jihad Daneshgahi, Noor Specialized Journal, National Publications Information Bank, and IranDoc (for Iranian studies); and Science Direct, Emerald, JSTOR, ProQuest, EBSCO, Springer, Scopus, and Sage (for international works).

A purposive sampling strategy was adopted to ensure that only relevant and methodologically sound research was included. The inclusion criteria encompassed:

- Title relevance: explicit reference to Sustainable Human Resource Management.
- Abstract and content relevance: clear discussion of SHRM concepts, antecedents, and consequences.

Studies were excluded based on the following criteria:

- Absence of organizational context.
- Disproportionate sample sizes compared to other studies.
- Qualitative rather than quantitative research design.
- Lack of access to full article texts.
- Unverified or unclear variable relationships.

Out of an initial pool of 253 identified studies, rigorous screening led to the selection of 29 eligible studies that met all criteria (see Table 1).

The keywords used in the search process were: *Sustainable Human Resource Management*, *Green Human Resource Management*, *Factors Influencing Sustainable Human Resource Management (Antecedents)*, and *Consequences of Sustainable Human Resource Management (Outcomes)*.

**Table 1.** Information from reviewed research

Researcher	year	Title	Variables (effect size)	Sample number
Cachón-Rodríguez et al.	2022	How sustainable human resources management helps in the evaluation and planning of employee loyalty and retention: Can social capital make a difference?	Outcome: social capital (0.67)	529
Aboramadan et al.	2022	Green human resource management in nonprofit organizations: effects on employee green behavior and the role of perceived green organizational support	Outcome: voice behavior (0.74), knowledge sharing (0.55), helping behavior (0.56)	408
Ali et al. (a)	2024	Green HRM practices and corporate sustainability performance	Outcome: organization culture (0.28), CSR (0.54), Green behavior (0.32)	242
Ali et al. (b)	2024	Weaving a greener future: The impact of green human resources management and green supply chain management on sustainable performance in Bangladesh's textile industry	Outcome: environmental performance (0.11), sustainable performance (0.18)	450
Almarzooqi et al.	2019	The role of sustainable HRM in sustaining positive organizational outcomes	Outcome: knowledge sharing (0.74), employees' empowerment (0.76), sustainable performance (0.33), sustainable organization support (0.65)	293
Chaudhary	2020	Effects of green human resource management: testing a moderated mediation model	Outcome: Organizational Attractiveness (0.60), Job Pursuit Intentions (0.47)	172
Cheema & javed	2017	The effects of corporate social responsibility toward green human resource management: The mediating role of sustainable environment	Outcome: environmentally sustainable (0.88), CSR (0.37)	273
Martínez-Falcó et al	2024	Green human resource management and sustainable performance in the wine industry: the mediating role of green innovation	Outcome: innovation (0.67), sustainable performance (0.50)	196
.Freitas et al.	2020	Green human resource management and corporate social responsibility	Outcome: CSR (0.59)	79
García-Cruz et al.	2024	When the stars align: The effect of institutional pressures on sustainable human resource management through organizational engagement	Antecedent: employees ingagement (0.50), institutional pressures (0.76)	206
.Ghourì et al.	2020	Enhancing business performance through green human resource management practices: empirical	Outcome: sustainable performance (0.55),	179



Researcher	year	Title	Variables (effect size)	Sample number
		evidence from Malaysian manufacturing industry	environmental performance (0.91)	
Hooi et al.	2021	Green human resource management and green organizational citizenship behavior: do green culture and green values matter?	Outcome: organizational culture (0.83), OCB (0.66)	240
Le and Tham	2024	Nexus of green human resource management and sustainable corporate performance: the mediating roles of green behavior and green commitment	Outcome: commitment (0.50), green behavior (0.41), sustainable performance (0.32)	322
Mariappanadar and Kramar	2014	Sustainable HRM The synthesis effect of high-performance work systems on organizational performance and employee harm	Antecedent: Hpws (0.50)	240
Mushtaq and Akhtar	2024	Sustainable HRM strategies, enhancing organizational resilience and advancing sustainability goals	Outcome: social sustainable (0.51), economic sustainable (0.69), environmental sustainable (0.43), organizational resilience (0.51)	153
Nakra and Kashyap	2024	Responsible leadership and organizational sustainability performance: investigating the mediating role of sustainable HRM	Antecedent: leadership style (0.56) Outcome: sustainable performance (0.58)	620
.Freitas et al.	2021	Green human resource management, corporate social responsibility and customer relationship management: relationship analysis in the Brazilian context	Outcome: CSR (0.72)	142
Sharma et al.	2022	Analysing the impact of sustainable human resource management practices and industry 4.0 technologies adoption on employability skills	Outcome: employability skills (0.22)	198
Yusliza et al.	2019	Top management commitment, corporate social responsibility and green human resource management	Antecedent: CSR (0.24)	87
Ahmadzadeh and shokooh	2020	The Role of Social Capital in Achieving Organizational Innovation and Organizational Citizenship Behavior with the Mediating Role of Sustainable Human Resource Management	Antecedent: social capital (0.66) Outcome: innovation (0.22), OCB (0.48)	196
Estanesi and Mahdibeigi	2021	The Impact of Green Human Resource Management on Enhancing Environmental Performance in Hospitals; The Mediating Role of Green Organizational Culture	Outcome: organizational culture (0.59), environmental performance (0.88)	217
Akbari and Shayegh	2023	Analyzing the Impact of Human Resource Management and Corporate Social Responsibility on Sustainable Performance with the Mediating Role of Environmentally-oriented Citizenship Behavior	Outcome: OCB (0.46), sustainable performance (0.66)	108
Pashazadeh and	2024	Investigating the Impact of Sustainable Human	Outcome: social capital	190



Researcher	year	Title	Variables (effect size)	Sample number
Behroozi		Resource Management Approaches on Social Responsibility: Evaluating the Mediating Role of Social Capital (Case Study: Small and Medium Enterprises in West Azerbaijan Province)	(0.50), CSR (0.50)	
Poorahmadi et al.	2022	Antecedents and Consequences of Sustainable Human Resource Management in Waste Management Organizations	Antecedent: leadership style (0.37), strategy (0.50) Outcome: sustainable performance (0.75), organizational attractiveness (0.64), employees engagement (0.66), turnover (0.62)	125
Hamzevi et al.	2023	The Impact of Sustainable Human Resource Management on Employee Retention and the Mediating Role of Social Capital	Outcome: maintenance of employees (0.78), social capital (0.42)	184
Rastegar et al.	2019	The Impact of Human Resource Management on the Environmental Performance of Hotel Employees	Outcome: green behavior (0.28), organizational commitment (0.66)	236
Arman et al.	2016	The Impact of Social Capital and Human Resource Maturity on Sustainable Human Resource Management (Case Study: Companies Active in the Petrochemical Industry, (	Antecedent: human resources maturity (0.33), social capital (0.71)	150
Ghahreman Bahar and Hassan Zadeh	2022	Examining the Relationship Between Innovation, Sustainable Human Resource Management and Customer Satisfaction (Case Study: Customers of Alis Dairy Company in Khorasan Razavi Province)	Outcome: customer satisfaction (0.12)	384
.Koshtegar et al.	2022	Analyzing the Impact of Sustainable Human Resource Management and Industry Progress on Employee Employability Skills (Case Study: University of Sistan and Baluchestan)	Outcome: Employability Skills (0.32)	150

In this study, a checklist was used to select relevant studies. The checklist included the following items: year (studies published in reputable journals or scientific databases from 2000 to 2024 in Iran and abroad), the subject of the research must include sustainable human resource management, sustainable human resource management must be used as either an independent or dependent variable, the research method must be descriptive or correlational, the sample size must be sufficient for effect size calculation, statistical tests must involve correlation or means, and the validity and reliability as well as the significance of the research statistics.

To assess validity, the content validity method, involving consultation with several professors, was employed. Reliability was evaluated using a checklist. For data analysis, descriptive indices of the studies will be introduced first; then, effect sizes will be compared and combined using software.

The most common statistics for calculating effect sizes are "r" and "d," where "d" is typically used for group differences and "r" for correlational studies. In this research, the correlation coefficient "r" was used to estimate effect size. For studies that reported t and z values, these were converted to "r."



Comprehensive meta-analysis software (CMA) was used for all calculations. Features of the software include data entry, selection of analysis methods (correlation), calculation of effect sizes, fixed and random effects models, and assessment of publication bias. The data obtained were converted into effect sizes using the software, and these effect sizes were then combined using Hunter and Schmidt's method (1990). The combined effect of variables was calculated in both fixed and random models. Thus, the spurious effects of issues such as excessively high or low sample sizes and weighted averages of effect sizes were taken into account.

The fixed effects model assumes that the actual effect of the experimental treatment is similar across all studies. In contrast, the random effects model assumes that the estimate of the actual effect of the experimental treatment varies from one study to another (Ghorbani Zadeh, 2018: 36).

To interpret effect sizes, Cohen's criteria (1988) were utilized. An effect size between 0.1 and 0.3 is considered weak; an effect size between 0.3 and 0.5 is considered moderate, and an effect size greater than 0.5 is considered strong.

To estimate the status of publication bias, the funnel plot method was employed. The Duval and Tweedie methods, along with Rosenthal's Fail-safe N test, were used to determine the number of missing studies.

Research Findings

Among the 29 selected studies, Sustainable Human Resource Management (SHRM) was examined as an antecedent in 10 cases and as an outcome in 52 cases. Altogether, eight independent variables and twenty-five dependent variables were identified as the antecedents and consequences of SHRM. Of the studies reviewed, 34% were conducted in Iran and 66% internationally. Among the international studies, 16% were carried out in Brazil and India, 11% in Pakistan, Spain, and Malaysia, and 5% each in the United Arab Emirates, Bangladesh, Saudi Arabia, Taiwan, Vietnam, and Palestine. Furthermore, 5% of the studies involved multinational contexts. Regarding reliability assessment, 27% of the studies employed confirmatory factor analysis and composite reliability, while 73% used Cronbach's alpha (some also reported confirmatory factor analysis and composite reliability). In evaluating validity, 50% of studies reported construct validity, 13% convergent validity, and 37% content validity. The frequency of each variable and its corresponding effect size are shown in Table 2. Following Cohen's criteria and the effect sizes reported in Table 2, the variables are classified into three categories: small ($r < 0.30$), moderate ($0.30 \leq r < 0.50$), and large ($r \geq 0.50$) effects.

Table 2. Frequency and intensity of effect size of antecedents and consequences of SHRM

dimension	Independent variable	Dependent variable	Frequency	Frequency Percentage	Effect size	Total effect
Individual antecedents	Engagement	SHRM	1	10%	0.499	0.457
	Human resources maturity		1	10%	0.330	
	Leadership style		2	20%	0.532	
Organizational antecedents	CSR	SHRM	1	10%	0.236	0.549
	Social capital		2	20%	0.685	
	strategy		1	10%	0.499	
	HPWS		1	10%	0.498	
Environmental antecedents	Institutional pressures	SHRM	1	10%	0.756	0.756
Individual	SHRM	Voice behavior	1	2%	0.740	0.540



outcomes			Help behavior	1	2%	0.560	
			empowerment	1	3%	0.760	
			Green behavior	3	6%	0.347	
			job pursuit intention	1	2%	0.469	
			commitment	2	4%	0.571	
			Employability skill	2	4%	0.259	
			Engagement	1	2%	0.661	
			turnover	1	2%	0.621	
			Social sustainable	1	2%	0.510	
			Social capital	3	6%	0.593	
			Knowledge sharing	2	4%	0.629	
			Organizational culture	3	6%	0.618	
			CSR	5	10%	0.520	
			Sustainable performance	8	15%	0.454	
			organizational support	1	2%	0.650	
Organizational outcomes	SHRM		organizational attractiveness	2	4%	0.617	0.473
			Innovation	2	4%	0.481	
			maintenance of employees	1	2%	0.780	
			OCB	3	6%	0.563	
			Economic sustainable	1	2%	0.693	
Environmental outcomes	SHRM		organizational resilience	1	2%	0.510	0.584
			Environmentally sustainable	2	4%	0.778	
			Environmental performance	3	6%	0.626	
			Customer satisfaction	1	2%	0.115	

The first group comprises variables with small effect sizes, indicating weak relationships, where the absolute effect size ranges from 0.1 to 0.3. The probability of rejecting the hypotheses associated with these variables in subsequent studies is relatively high. Within this group, *customer satisfaction* and *employability skills* are identified as consequences of Sustainable Human Resource Management, whereas *corporate social responsibility* appears as an antecedent with a similarly weak effect size.

The second group includes variables with moderate effect sizes, falling within the range of 0.3 to 0.5. These represent more stable and contextually significant relationships within SHRM. Individual-level antecedents and organizational-level consequences generally exhibit moderate effect sizes in this category. Specifically, *participation*, *human resource maturity*, *strategy*, and *high-performance work systems* are identified as antecedents, while *employee behavior*, *job pursuit intention*, *sustainability performance*, and *innovation* function as consequences.



The third group consists of variables demonstrating large effect sizes (greater than 0.5), signifying strong and highly consistent relationships expected to be confirmed across future studies. These variables encompass both organizational and environmental antecedents and a broad range of individual and contextual outcomes. The main antecedents include *leadership style*, *social capital*, and *institutional pressures*. The associated consequences comprise *voice behavior*, *helping behavior*, *empowerment*, *commitment*, *participation*, *turnover intention*, *social sustainability*, *social capital*, *organizational culture*, *knowledge sharing*, *corporate social responsibility*, *organizational attractiveness*, *organizational support*, *employee retention*, *citizenship behavior*, *economic sustainability*, *organizational resilience*, *environmental sustainability*, and *environmental performance*.

Overall, the results indicate that environmental antecedents exert a more substantial influence on Sustainable Human Resource Management than other categories of antecedents, while environmental consequences occur more frequently and more robustly than other SHRM outcomes. In the subsequent stage, the study examined the publication bias within the meta-analytic data. Such bias may arise due to several factors, including the selective publication of positive results while ignoring negative findings, inappropriate weighting of reviewed studies, neglecting variations in methodological quality, applying different statistical tests, and failing to use suitable scoring criteria in data review. To identify and visualize potential bias, funnel plots were employed for analysis, as illustrated in Figures 1 and 2.

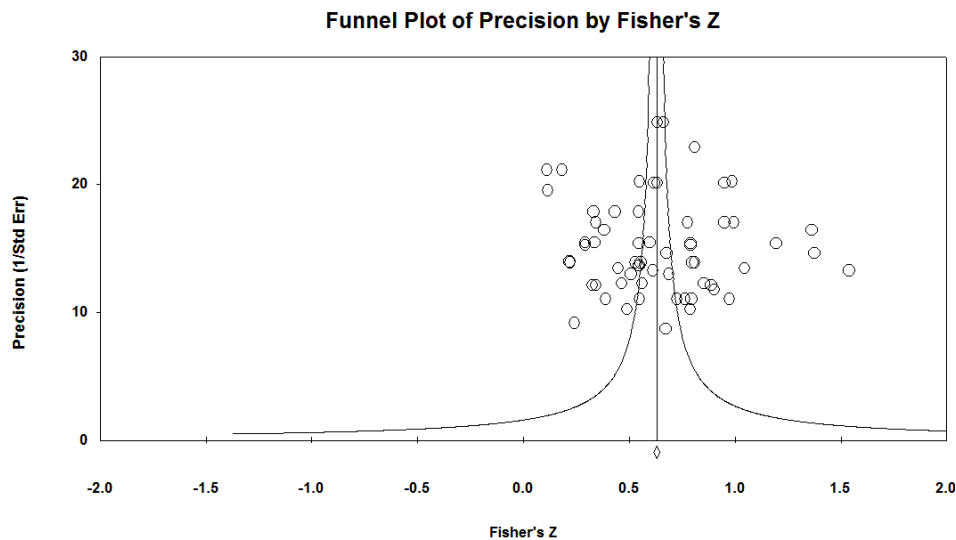


Figure 1. Funnel plot of the research reviewed in this study

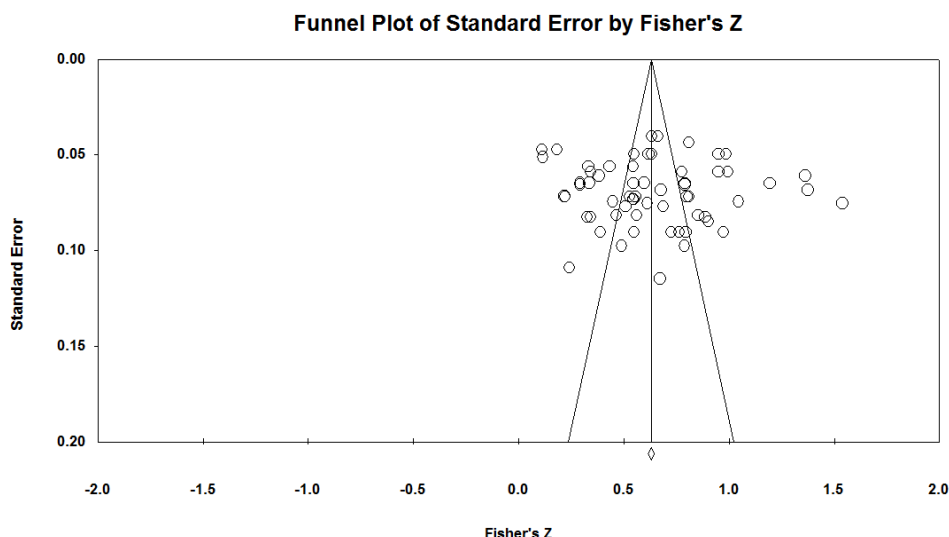


Figure 2. Standard error plot of Fisher's statistic of the studies reviewed in this study

The funnel plot can appear in two distinct forms. Figure 1 presents effect sizes in relation to precision indices (the inverse of the standard error), while Figure 2 displays the distribution based on standard error values. A funnel plot is considered symmetrical when publication bias is minimal or entirely absent. In such plots, studies with high standard errors tend to cluster toward the bottom, whereas those with low standard errors concentrate near the top (Ghorbani Zadeh, 2018: 135–136). In essence, when publication bias is present, a noticeable asymmetry occurs—the dispersion of data points at the bottom of the plot expands more on one side than the other.

In Figures 1 and 2, the analyzed variables are shown as small circles. The symmetrical distribution of these circles around the central composite effect size axis, particularly at the upper portion of the plot, demonstrates the absence of publication bias within the dataset. Correspondingly, the results from the Duval and Tweedie Trim-and-Fill method, used to statistically confirm this visual interpretation, are summarized in Table 3.

Table 3. The Duval and Tweedie Trim and Fill

	Fixed Effects			Random Effects			Q value
	Point estimate	Lower estimate	Upper estimate	Point estimate	Lower estimate	Upper estimate	Studies Trimmed=0
Observed values	0.557	0.546	0.568	0.564	0.509	0.614	1386.67
Adjusted values	0.557	0.546	0.568	0.564	0.509	0.614	1386.67

The Trim and Fill method, introduced by Duval and Tweedie to mitigate publication bias, is particularly useful in small samples where asymmetric or non-conforming observations in the funnel plot are first removed and then the algorithm imputes values for studies presumed missing—essentially estimating effect sizes and standard errors for overlooked findings. When a large number of such imputed studies accumulate on one side of the mean effect line, it signals potential publication bias or slight sampling bias (Ibid: 179). As shown in Table 3, the fixed-effect and random-effect models yield identical point estimates, confidence limits, and Q-values for both the observed and adjusted data. The resulting



count of zero missing studies therefore indicates that no additional studies are required to complete or correct the analysis under either model. Consistent with this, the funnel plot in Figure 1 shows no highlighted point suggesting a missing study. The outcomes of the Fail-Safe N analysis are reported in Table 4.

Table 4. Fail-safe N test analysis

Z-value for observed studies	75.304
P-value for observed studies	0.000
Alpha	0.05
Tails	2
Z for alpha	1.96
Number of observed studies	62
Number of missing studies that would bring P-value to > alpha	91463

This test determines the number of additional studies that would be required to nullify the overall statistical significance of the meta-analysis. As shown in Table 4, a total of 91,463 additional studies would need to be introduced for any deviation or error to emerge in the calculations and analyses—specifically, for the significance level to surpass 0.05. This exceptionally high fail-safe value attests to the robustness and precision of the results, confirming the strong reliability and stability of the findings in this research.

Discussion and Conclusion

Based on the findings, the antecedents and consequences of sustainable human resource management (SHRM) are multifaceted, and their identification is essential for establishing a comprehensive SHRM framework. The primary objective of this research was to examine the antecedents and consequences of SHRM across studies published between 2000 and 2024. Given the significance of the topic and the need to consolidate fragmented findings from previous research, this meta-analysis was conducted to provide an integrated picture of how SHRM operates within organizational systems. Employing a meta-analytic approach constitutes a major methodological innovation in this study.

A comprehensive literature review revealed that leadership style and social capital emerged as the most frequent antecedents (each identified in two studies), while sustainability performance (eight studies) and corporate social responsibility (CSR) (five studies) were the most commonly reported consequences. The results of the meta-analysis further demonstrated that environmental antecedents exert a stronger influence on SHRM compared to other categories, and likewise, environmental consequences display higher susceptibility and significance. Among all the antecedent variables, institutional pressures, social capital, and leadership style were identified as the most impactful. On the consequence side, employee retention, environmental sustainability, empowerment, and voice behavior were among the most influential outcomes.

Institutional pressures emerged as the most critical antecedent with an effect size of 0.756, corroborating García-Cruz et al. (2024). Their study emphasized that coercive pressures (threats, sanctions, or penalties), normative pressures (social and professional expectations), and mimetic pressures (imitation of successful industry practices) collectively drive organizations toward adopting sustainable HRM strategies. These mechanisms enable firms not only to generate sustainability benefits but also to support the long-term development of human capital. In other words, environmental forces compel managers to implement sustainability initiatives, which, in turn, strengthen employee-organization trust over time. It is therefore recommended that managers respond to external pressures in ways aligned with their organization's capabilities to enhance external legitimacy. Transitioning from



reactive to proactive management and increasing interaction between employees and managers fosters a sense of shared value—an essential strategy for sustaining long-term organizational performance.

The second major antecedent, social capital, demonstrated an effect size of 0.685, in line with Ahmadzadeh Shokooh (2020) and Arman et al. (2016). Strengthening social capital promotes work-life balance, positively influencing job attitudes and sustainable development. A culture of trust is therefore indispensable for achieving sustainable HRM outcomes. It is recommended that organizations implement training programs to raise awareness of social capital and SHRM principles among managers and employees, recognize both professional and personal needs, reduce internal siloed thinking, and promote interactive and network-based communication to reinforce organizational trust.

The third identified antecedent, leadership style (effect size = 0.53), supports previous research by Poorahmadi et al. (2022) and Nakra & Kashyap (2024). Sustainable leadership positively influences SHRM practices by embedding shared ethical and organizational values. Transparent leadership, in particular, acts as a transformative catalyst for aligning employee behavior with sustainability principles. Nakra and Kashyap (2024) describe SHRM functions as the “hardware” and leadership values as the “software” of organizational sustainability—meaning leadership provides the moral and operational framework through which HR systems achieve sustainable outcomes. Consequently, organizations are encouraged to invest in responsible leadership development, cultivating sensitivity to stakeholder concerns through targeted training. Leaders should leverage SHRM practices as ethical instruments to promote desirable performance results.

Among the consequences, employee retention was identified as the most significant, recording an effect size of 0.78. This indicates that organizations effectively integrating SHRM principles not only improve their sustainability performance but also strengthen employee loyalty and retention—a cornerstone of enduring organizational success.

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