



Green Employee Engagement for Environmental Sustainability and Operational Excellence in the Palm Oil Industry: A Systematic Literature Review

***Posma Sinurat¹**

Universitas Esa Unggul,
Indonesia

Pawenary²

Universitas Esa Unggul,
Indonesia

Safuan³

Universitas Esa Unggul,
Indonesia

Edi Hamdi⁴

Universitas Esa Unggul,
Indonesia

***Corresponding author:**

Posma Sinurat, Universitas Esa Unggul,
Indonesia. ✉ posmasinurat@gmail.com

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Abstract

Background: Palm oil industry supports growth but faces environmental scrutiny; green employee engagement's role in sustainability and operational excellence remains underexplored.

Objective: To develop a conceptualization of green employee engagement and to examine the contribution of green employee engagement to environmental sustainability and to the operational performance of palm oil mills, through a Systematic Literature Review (SLR).

Methods: PRISMA review of 19 articles (2019–2025), retrieved through Scopus, Web of Science, ScienceDirect, Emerald, MDPI, and Google Scholar. Inclusion criteria included peer-reviewed articles published only in English or *Bahasa Indonesia*; articles published in Q1–Q4 or SINTA 1–3 journals focused specifically on Green HRM (or its constructs) and environmental/operational performance.

Results: Employees are now at the center of the green agenda, and this has become one of the strategic drivers of organizational transformation. HR drives systemic change through Green HRM, a powerful mediating system, by investing in operational innovation, strong green culture, efficient green training, sustainable talent development, and green recruitment. This directly assists HR managers and policymakers when designing work systems that improve energy efficiency, reduce waste, and increase compliance.

Conclusion: Green employee engagement is a tool in this regard, more than a management practice; it goes straight to the core of shifting the industry. This synthesis reveals three prominent patterns: (1) GHRM integration facilitates green culture, (2) the role of HR as a strategic enabler in systemic implementation, and (3) green employee engagement as a driver of operational efficiency and competitiveness in the palm oil industry.

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INTRODUCTION

The palm oil industry is one of the strategic sectors in developing countries, particularly in Southeast Asia, due to its contribution to economic growth, employment, and global commodity exports. However, as international pressure on environmental issues increases, the industry's existence is increasingly being questioned due to its significant ecological footprint. Deforestation, greenhouse gas emissions, and land conflicts are the main issues demanding reforms in the palm oil industry's sustainability practices (Teoh, 2010). Amidst these challenges, the transformation of the palm oil industry requires not only the adoption of environmentally friendly technologies, but also the active participation of the human resources running the company's operations. In this context, employee engagement in sustainability efforts—known as green employee engagement—is becoming increasingly important as part of an organization's internal strategy.

Green employee engagement refers to employee involvement in organizational activities and values that support the environment, such as energy efficiency, waste reduction, and participation in corporate social responsibility programs (Nasir Ansari & Irfan, 2023). This engagement not only increases the effectiveness of environmental policies, but also reinforces an organizational culture that cares about sustainability. Therefore, the role of employees in the green transition process can no longer be considered as a complement, but rather as the main actor in organizational change (Antonioli et al., 2013).

Green Human Resource Management (GHRM) is a strategic approach that integrates sustainability aspects into HR management practices such as recruitment, training, performance appraisal, and compensation. Through GHRM, companies can shape pro-environmental work behaviors and support organizational strategies in the long term (Omarova & Jo, 2022). In the palm oil context, even more important is the initiation of GHRM and enhancement of GEE in the green agenda, given the very high environmental risk associated with this industry. Companies that methodically and successfully implement GHRM are likely to be more responsive toward stronger environmental regulation, as well as mounting global market pressure for sustainable products (Guerci et al., 2016).

Despite a growing volume of literature on Green HRM and employee sustainability practices, a number of research gaps remain⁴: such reviews have never focused on green employee engagement as a multidimensional motivator contributing to environmental sustainability linked to operational excellence in the palm oil manufacturing industry. The majority of research is either sector-agnostic or singularly outcome-focused (such as environmental compliance) without consideration for the intertwined operational and strategic dimensions. This gap is especially important to fill because the palm oil sector simultaneously faces the external pressures of competition and increasingly strict global sustainability criteria (Bhastary et al., 2022).

This research is additionally motivated by Indonesia's commitment to the Sustainable Development Goals (SDGs) and the binding ISPO certification framework. Hence, this study seeks to systematically map the body of existing literature, synthesize the prevailing paradigms, and propose a new conceptual model that explains green employee engagement in palm oil mills towards sustainability outcomes and operational excellence. This review aims to contribute to the literature focusing on employee engagement and sustainable development by offering a synthesis model that connects employee engagement, sustainability outcomes, and operational excellence.

Moreover, the implementation of green initiatives by employees also contributes to enhancing operational performance. Chaturvedi (2023) showed that engaging employees in energy efficiency, efficient resource utilization, and minimizing operational costs can help save money and increase productivity. Reinforcing Green Employee Engagement in Corporate Landscape: A Case Study from Palm Oil Mills underscores corporate image values and establishes a clear link to the efficiency of the production process, liquid and solid waste management, and emission control. Simply put, green involvement by employees leads to more efficient and sustainable operational performance.

On the other hand, changes towards a green work culture require visionary leadership and an organizational system capable of facilitating behavioral change. Transformational leadership that emphasizes environmental values and employee empowerment has proven effective in shaping an organizational culture that is adaptive to change (Rojak et al., 2024). In this

case, the role of the HR department is not only administrative, but also strategic in designing work systems that support sustainability. Strengthening green culture in the workplace also increases employees' job satisfaction, loyalty, and intrinsic motivation Shahriari (2023), which in turn strengthens the organization's overall competitiveness.

Unfortunately, while the concept of green employee engagement has been widely discussed in the global literature, studies linking it specifically to the palm oil sector are limited (Bhastary et al., 2022). In fact, the local context and unique characteristics of this industry require a contextualized and strategic approach in building green engagement. Thus, a systematic examination of the current research trends on employee engagement as an enabler in the organizational change process and its contributions to environmental sustainability and operational performance in palm oil mills is needed (Abdullah et al., 2017).

This research must also consider the role of HR strategies (green talent management; internal CSR; environmental certification) in facilitating the change management process. In this regard, the present research attempts to address five central questions that integrate both the theoretical and practical aspects of employee green engagement in the palm oil industry. Using Systematic Literature Review (SLR) methodology, this study not only offers a comprehensive mapping of current knowledge but also provides strategic tools for HR managers and policymakers to build greener, participatory, and sustainable job systems.

LITERATURE REVIEW

Green Employee Engagement (GEE) – What is it?

Green Employee Engagement (GEE) is the inclusion of employees in sustainability efforts and practices within the organization. It is not just participation in company initiatives but also through a dedicated interest toward environmental conservation and corporate social responsibility. GEE includes multiple aspects, namely Green Human Resource Management (GHRM) practices, participation in waste management policies and emissions reduction, and effective use of natural resources. GEE employees are not just emotionally attached to their jobs but take ownership in helping the company, which prides itself on being green and sustainable. As environmental issues become more pertinent, organizations are adopting GEE as part of their cultural resourcing to set sustainability as a business norm (in terms of operations) (Hossain et al., 2022; Ramli et al., 2025).

GEE is also shaped by internal policies that promote sustainability, continuous training on environmental best practices, and the use of green technology in company operations. At the same time, GEE recognizes that the creation of an organizational ecosystem is needed to support green behavior (Hendarjanti, 2022). Involvement in these practices creates a powerful catalyst for achieving broader sustainability objectives and increases environmental awareness, which ultimately has a positive impact on the company's image and competitiveness.

Green Employee Engagement and Its Contribution to Sustainability

Green Employee Engagement plays an important role in the context of sustainability, facing global challenges like climate change and natural resource depletion. Better ecological performance and a smaller environmental footprint are achieved by engaging employees toward environmental objectives. By not only driving compliance with established policies, but also engaging employees in developing and implementing effective environmental strategies, GEE helps organizations achieve sustainability goals. Sustainability-focused trainings and the application of Green HRM principles can achieve ingrained behavioral changes, evoking employees' support in the company's efforts to be sustainable long-term (Gazi et al., 2025; Shahrulnizam et al., 2024).

Moreover, GEE contributes to a positive business reputation among the public and stakeholders. Additionally, organizations focusing on sustainability can develop a positive reputation with consumers who care about such issues. Employees working on Green initiatives also contribute to the organization's achievement of several environmental certifications, such as ISO 14001 or the Roundtable on Sustainable Palm Oil (RSPO), which enhances the company's credibility and competitiveness in the related market (Niramitsrichai et al., 2021). Hence, GEE not only helps organizations from an environmental standpoint but also provides sustainable

business benefits.

Green Employee Engagement and Operational Excellence

The process of Green Employee Engagement (GEE) supports organizational sustainability and enables organizations to pursue operational excellence. In this scenario, combating waste and partnering employees with green initiatives yield overall better operational efficiency for the organization and give a boost to its profitability. GEE enables employees to learn and take an active role in operational excellence by identifying opportunities to improve energy efficiency, reduce waste, and optimize resource consumption. Through continuous training programs, skills development, and the empowerment of employees to propose innovative ideas, companies can create a work culture that supports efficiency and sustainability in every aspect of their operations (Alkhozaim et al., 2024; Sulistiono et al., 2019).

GEE also improves employee performance in terms of productivity and job satisfaction, which are critical to achieving operational excellence. Employees who feel engaged in the organization's sustainability goals tend to be more motivated to work in a more efficient and innovative manner. In addition, involvement in green practices helps increase their sense of responsibility and ownership of their work, leading to improved quality and consistency in operational processes. In other words, GEE serves as a driver of a continuous improvement culture, where every member of the organization is committed to contributing to improvement throughout the operational cycle (Hendarjanti, 2022; Trisyulianti et al., 2022).

Furthermore, GEE embedded through the principles of Stakeholder Theory will encourage the achievement of operational excellence. This is because employees, as one of the main stakeholders, become more proactive in contributing innovative ideas, improving process efficiency, and strengthening a culture of continuous improvement. In line with the findings of Choong et al. (2024), GEE facilitated by concern for stakeholders' interests results in improved operational performance such as waste reduction, energy efficiency, and work process optimization. Thus, the integration of Stakeholder Theory in GEE practices creates not only social value, but also sustainable operational value.

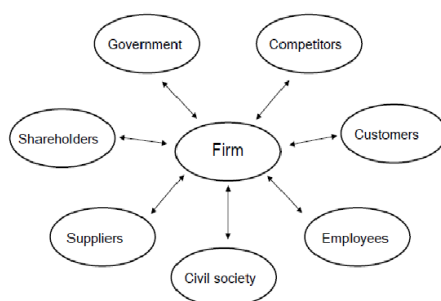


Figure 1. Stakeholder Theory Diagram

Source: (Mishra & Mishra, 2013)

The figure above is a classic representation of Stakeholder Theory as described by (Mishra & Mishra, 2013). In this model, the firm is at the center and surrounded by various stakeholder groups that have influence and interest in the firm's operations, namely government, competitors, customers, employees, civil society, suppliers, and shareholders. Each of these external and internal actors has different expectations, demands, and contributions to the sustainability and success of the organization. This model emphasizes that companies should not only prioritize the interests of shareholders, but also pay attention to the impact on all stakeholders in making business decisions.

In the context of Green Employee Engagement (GEE), employees, as one of the main stakeholders, play a key role in bridging the company's internal interests with external demands, especially in sustainability issues. Through active engagement of employees in green practices—such as waste management, energy efficiency, and participation in sustainability programs—companies not only meet the expectations of stakeholders such as government and civil society, but also strengthen internal commitment to sustainability. Green-engaged employees will

accelerate the implementation of a company's sustainability vision as they become change agents who understand the value of sustainability not just as a duty, but as part of their work identity.

Furthermore, operational excellence can be achieved sustainably if companies integrate the principles of Stakeholder Theory in their internal management through the GEE approach. Operational excellence, which is the ability to run business processes efficiently, adaptively, and in a value-adding manner, will be easier to achieve when employees are actively involved in sustainability initiatives. For example, employee engagement in energy management systems or lean-green manufacturing will result in cost efficiencies, waste reduction, and improved corporate reputation in the eyes of customers and regulators. Hence, GEE is the link between corporate responsibility toward the stakeholders and long-term operational excellence.

METHOD

Research Approach

This study employs a qualitative research approach using a Systematic Literature Review (SLR) design to comprehensively analyze the role of Green Employee Engagement (GEE) in supporting environmental sustainability and operational excellence in the palm oil industry. The SLR approach enables a structured, transparent, and reproducible process for identifying, evaluating, and synthesizing relevant academic literature. This study follows the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol to ensure methodological rigor in article selection, screening, and reporting.

Stage 1: Planning

This stage was conducted to ensure that the study was structured and had strong academic justification. The following activities were carried out in this stage: 1) Identification of research needs: The topic of green employee engagement in the palm oil sector is considered limited in the academic literature. 2) SLR protocol development: Including the formulation of research questions, keywords, and inclusion and exclusion criteria. 3) Protocol evaluation: Adjustments were made to ensure relevance to the study's focus on HRM and sustainability in the tropical industry sector.

Stage 2: Implementation

Research Question

This research is directed at answering the following five questions:

- 1) RQ1: What are the trends in research on green employee engagement in supporting environmental sustainability and operational performance in palm oil mills?
- 2) RQ2: How is green employee engagement part of the organization's change strategy?
- 3) RQ3: What changes occur in the organization when implementing green initiatives?
- 4) RQ4: What is HR's role in managing change toward a green culture?
- 5) RQ5: What does the literature show regarding green engagement as part of the change management process?

Search Strategy

The search process was conducted across seven major scientific databases: Google Scholar, MDPI, Emerald Insight, ScienceDirect, Scopus, WoS, and ProQuest. The keywords used in the search process were: ("green employee engagement" OR "green human resource management" OR "green HRM") AND ("environmental sustainability" OR "sustainable practices") AND ("operational performance" OR "organizational performance") AND ("palm oil"). Search filters: 1) Timeframe: 2019–2025. 2) Language: English and *Bahasa Indonesia* 3) Publication type: peer-reviewed journal article.

Selection Criteria

Inclusion: a. Empirical articles and conceptual studies that address employee engagement, GHRM, and organizational sustainability in the context of the palm oil industry. b. Studies that explicitly link green HRM with environmental or operational performance. c. Articles from Q1–Q4 and *Sinta 1–Sinta 3* indexed journals.

Exclusion: a. Non-peer-reviewed studies (such as organizational reports, conference papers, and opinion pieces). b. Articles that are not relevant to the industry sector (e.g., education, health). c. Studies that only discuss CSR without the internal dimension of HR.

The PRISMA diagram for article selection is presented as follows.

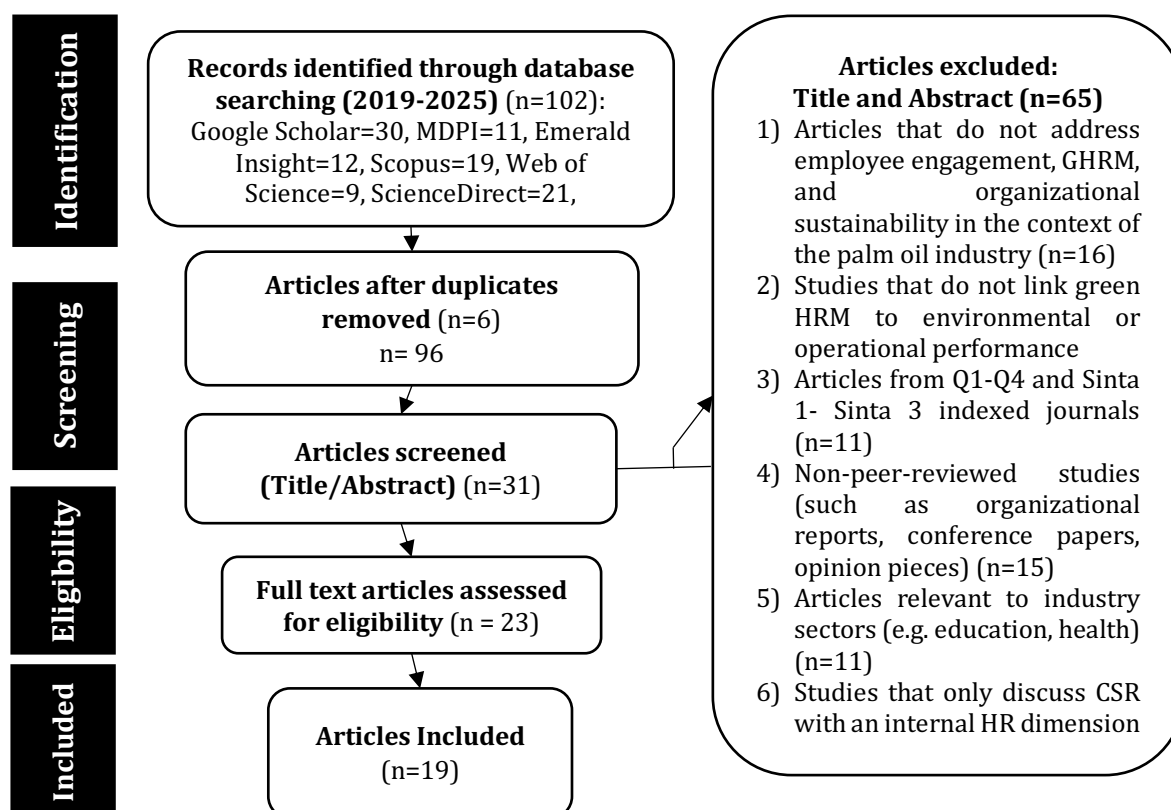


Figure 2. PRISMA Flowchart of literature search and selection

Source: Data Processed (2025)

The PRISMA diagram in Figure 2 illustrates the literature selection process for this Systematic Literature Review on green employee engagement in the palm oil industry. A total of 102 records were initially identified from six databases: Google Scholar (30), MDPI (11), Emerald Insight (12), Scopus (19), Web of Science (9), and ScienceDirect (21). After removing 6 duplicate records, 96 articles remained for the screening stage. During the title and abstract screening, 65 articles were excluded for not meeting the inclusion criteria, including: not addressing employee engagement, GHRM, and sustainability in the palm oil context (n=16); not linking green HRM to environmental or operational performance (n=16); not published in Q1-Q4 or Sinta 1-3 indexed journals (n=11); non-peer-reviewed publications (n=15); and studies from irrelevant sectors (n=7).

Following this process, 31 articles were retained for full-text assessment. At the eligibility stage, 12 articles were further excluded because they only discussed CSR without an internal HR dimension. Consequently, a total of 19 articles met all eligibility criteria and were included in the final analysis.

Data Extraction and Quality Assessment

Accordingly, a total of 19 articles were identified from the search results that fulfilled each of these criteria. Every featured article was qualitatively assessed and coded based on the five research questions. The clarity of the research aim, method, findings, and relevance to green employee engagement were employed for quality assessment.

Stage 3: Data Synthesis and Reporting

Data synthesis was performed thematically by each research question. We classified data

extracted from each article according to key themes, including: 1) Publication trends and journal quartiles (RQ1). 2) Integration of GHRM in organizational strategy (RQ2). 3) The impact of green initiatives on organizational structure and culture (RQ3). 4) HR's role in shaping green culture (RQ4). 5) The role of green engagement in the change management process (RQ5). Synthesized results in the form of summary tables, frequency graphs, and narrative descriptions are organized to describe the contribution of each article to each of the five proposed RQs. Bar charts and citation analysis tables were used to visualize the data.

RESULTS AND DISCUSSION

Result

Trends in Bioresearch: Green Employee Engagement in the Palm Oil Industry

On the other hand, research trends in Green Employee Engagement related to environmental sustainability and operational performance of palm oil mills have shown a significant increase over the last five years. Although little noticed at first, this topic has begun to show consistent publication growth as palm oil gains recognition for its role as a high-environmental-risk industry and the growing urgency of green human resource management practices becomes more apparent. A clearer and more precise picture of the dynamics behind this scientific evolution comes from an analysis based on publication quartiles and article frequency from 2019 to 2025, which can be viewed here.

Table 1. Frequency and Citation by Year and Publication Quartile

Year	Quartiles	Frequency	Citation
2019	Sinta 2	1	Sulistiono et al. (2019)
2021	Q1	1	Najib et al. (2021)
	Q4	1	Niramitsrichai et al. (2021)
2022	Q1	2	(Hendarjanti, 2022; Trisyulianti et al., 2022)
	Q2	1	Hossain et al. (2022)
2023	Q4	1	Hendarjanti et al. (2023)
2024	Q1	3	(Alkhozaim et al., 2024; Khaddage-Soboh et al., 2024; Soomro et al., 2024)
	Q3	2	(Mering, 2024; Shahrulnizam et al., 2024)
	Q4	1	Razali et al. (2024)
	Sinta 3	1	(Handayani et al., 2024; Idrus, 2024)
2025	Q2	1	Ramli et al. (2025)
	Q4	1	Gazi et al. (2025)
	Sinta 2	1	Satria et al. (2025)
	Sinta 3	1	Lestari et al. (2025)
Total		19	

Source: Data Processed (2025)

Table 1 further illustrates the findings presented in the figure by breaking them down by year and quartile of journal publication. Among the articles, most of the 19 articles were found to be published in highly reputed journals (particularly Q1 and Q2 journals, 2022 and 2024), reflecting the high-quality scientific credibility of the topic. The most significant year is 2024, where the number of publications reached its peak (7 articles in quartile-indexed journals and 2 articles in Sinta-accredited national journals), which can be explained by the growing emphasis on employee engagement strategies to drive sustainability transformation in the palm oil industry.

During the early years (2019–2021), publications were still few and sporadic, but these early contributions provide an important basis for the surge of research that followed. As evidenced by articles in national journals (Sinta 2 and Sinta 3), the issue of employee engagement is beginning to be studied in the local Indonesian context as well, broadening the applicability of employee engagement strategies not only at a global level but also at a national level. These data confirm that green employee engagement has become one of the strategic approaches to achieving operational change in the palm oil industry sector toward sustainability.

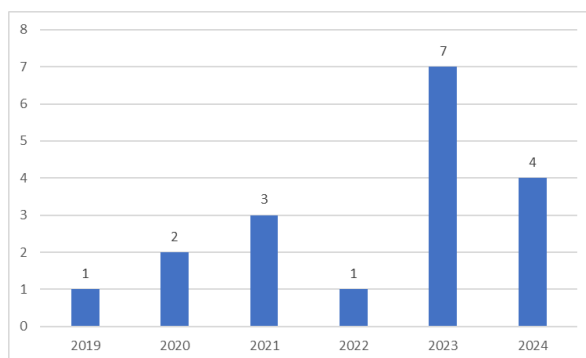


Figure 3. Graph of Article Frequency by Year
Source: Data Processed (2025)

For the trend of publishing scientific articles on GEE and operational sustainability, see Figure 3 (covering the years 2019 to 2024). This shows a growing research interest, starting from one publication in 2019, increasing to two publications in 2020 and three publications in 2021, followed by one publication in 2022. There was also a notable increase in publications in 2023, with a total of seven—marking the peak productivity in the reviewed period. While the number of publications dropped to four in 2024, this still represents considerable attention compared with previous years. This pattern indicates that GEE as a topic is increasing in prominence within the academic literature, particularly in light of the growing calls for a more sustainable and human capital-oriented transformation of the palm oil sector. Building on these findings, the following conceptual model of the research framework is presented in the figure below.

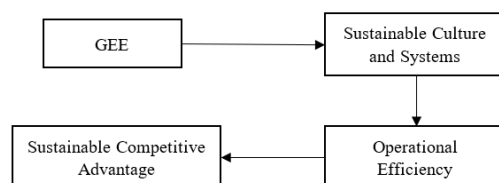


Figure 4. Conceptual Model of Research Synthesis
Source: Data Processed (2025)

The conceptual model above illustrates how Green Employee Engagement (GEE) acts as a catalyst in building a sustainability culture and system that ultimately drives operational efficiency and generates sustainable competitive advantage. GEE starts from the implementation of Green HRM practices such as green recruitment and training, and is supported by transformational leadership and employee empowerment, which encourage intrinsic commitment to environmental values (Handayani et al., 2024; Idrus, 2024; Khaddage-Soboh et al., 2024; Razali & Vasudevan, 2024).

This commitment then shapes an organizational culture that supports environmentally friendly behavior and systems that are integrated with certification policies such as RSPO and ISPO, and encourages the adoption of green innovations (Hendarjanti & Nawangsari, 2023; Lestari & Anjaningrum, 2025; Niramitsrichai et al., 2021; Satria et al., 2025). This transformation has a direct impact on operational efficiency through reduced energy and raw material costs, as well as increased productivity through green technology and environmental SOP compliance (Gazi et al., 2025; Ramli et al., 2025). Finally, these efficiencies contribute to achieving competitive advantage through regulatory compliance, strengthened ESG reputation, improved export market access, and organizational resilience in the face of global environmental challenges and achievement of the SDGs, particularly Goal 12 (Responsible Consumption and Production) and Goal 13 (Climate Action) (Isa et al., 2025; Soomro et al., 2024).

The Role of Green Employee Engagement in Organizational Change Strategy

Green employee engagement is increasingly seen as a driving force in organizational change strategies, especially in industrial sectors that have a significant impact on the environment, such as palm oil mills. Transformation toward a sustainable organization cannot be sufficiently achieved through policies and technology alone, but also requires active involvement from all elements of human resources. In this case, employee engagement in green initiatives and practices becomes a strategic imperative, as it can unite the organization's vision with concrete actions at the operational level. The following table summarizes five key dimensions of employee engagement in organizational change strategies, covering their role in HR policies, innovation, organizational culture, systemic collaboration, and green talent development.

Table 2. The Role of Green Employee Engagement in Organizational Change Strategy

No.	Reference Source	Role Category	Description
1	(Gazi et al., 2025; Razali & Vasudevan, 2024; Shahrulnizam et al., 2024)	Integration of Green HRM in Organizational Strategy	Green HRM practices (green recruitment, training, compensation) create a sustainable culture, increase employee engagement and reduce ecological footprint. Challenges such as regulation and socialization are overcome to ensure long-term change.
2	(Hendarjanti, 2022; Hendarjanti & Nawangsari, 2023)	Green Innovation and Environmental Commitment	Green innovation (e.g., emissions reduction) and employee commitment are key mediators in organizational transformation. Green behavior and green commitment connect GHRM strategies with sustainable performance.
3	(Hossain et al., 2022; Khaddage-Soboh et al., 2024; Mering, 2024; Najib et al., 2021)	Green Culture and Transformational Leadership	Cultural transformation through CSR, transformational leadership and top management support increases employee engagement in green practices, driving strategic change and continuous innovation.
4	(Niramitsrichai et al., 2021; Ramli et al., 2025; Trisyulianti et al., 2022)	Systemic and Multi-Stakeholder Participation	Employee involvement in certification programs (RSPO), circular economy, and adoption of green technology supported the organization's awareness to achieve holistic sustainability (economic, social, environmental).
5	(Alkhozaim et al., 2024; Soomro et al., 2024)	Green Talent Management and Operational Practices	Green talent management and operational practices (e.g., sustainable tourism, environmental CSR) build a work environment that supports organizational change, even under external conditions such as a pandemic.
6	(Lestari & Anjaningrum, 2025; Satria et al., 2025)	Organizational Innovation and Collaborative Culture	GWE strengthens green leadership and establishes an innovative work culture, increasing organizational resilience in the face of competitive challenges and long-term sustainability.
7	(Handayani et al.,	Green Empowerment,	Employee engagement strengthens

No.	Reference Source	Role Category	Description
	2024; Idrus, 2024; Sulistiono et al., 2019)	Performance and Education	commitment and job satisfaction, and is a reinforcing element of the relationship between GHRM and performance. Education and structural support are important factors in the success of green transformation.

Source: Data Processed (2025)

The integration of Green Human Resource Management (GHRM) into organizational strategy serves as an important basis for a sustainable work culture. Practices such as green recruitment, sustainability-based training, and compensation systems that encourage green behavior have been shown to increase employee engagement (Gazi et al., 2025; Razali & Vasudevan, 2024; Shahrulnizam et al., 2024). This is reinforced by Ansari (2023) who stated that the value of sustainability in the HR system is able to increase loyalty and intrinsic motivation. Furthermore, environmental commitment as well as this innovation encouraged by employees' involvement are the driving forces for organizational change (Hendarjanti, 2022; Hendarjanti & Nawangsari, 2023). The transformation process is also reinforced by employees actively engaged in emissions reduction and energy efficiency who have a thorough understanding of the strategic direction of the company. Xing (2019) similarly claimed that the environmental awareness of individuals within an organization broadens the capacity for innovation.

Green culture, along with transformational leadership, is the key driver of successful change. The research works of Mering (2024), Khaddage-Soboh (2024), Hossain (2022), and Najib (2021). [incomplete sentence — predicate and publication year missing; please review]. Visionary leaders have the ability to engage employees in sustainable practices, which creates a shared and adaptive work environment (Yu et al., 2021). According to Chen (2011), a key component of an appropriate leadership style is that it reinforces environmental values, strengthening organizational identity and trust among its employees. Systemically, change is made by participating in RSPO certification, engaging in circular economy practices, and adopting green technology (Niramitsrichai et al., 2021; Ramli et al., 2025; Trisyulianti et al., 2022). Norton (2015) explain that engaging in the green agenda at both levels allows change to be more inclusive and sustainable, due to a collective consciousness.

Green talent management is the key to organizational readiness to face global dynamics. Alkhozaim (2024) and Soomro (2024) argued that it is through green value-based career development that organizations can become adaptive and innovative. Georgescu (2024) pointed out that civilizational values of sustainability, which are integrated in HR development, contribute to strengthening the resilience of organizations facing crisis situations. Other studies show that involvement in green practices also enhances work satisfaction and quality of life.

Gusmerotti (2023) argue that environmental activities enhance meaningfulness of work, and while Fang (2022) stated that a green innovation culture shapes an inclusive work environment. Silvi (2021) found that intrinsic motivation is more effective in maintaining green behavior. Alshammari (2023) suggested that HR systems should be built holistically to support sustainability, and Isa (2025) asserted that employee engagement in SDG achievement strengthens organizational competitiveness. Therefore, employee engagement in the green agenda is not just a complement, but a strategic foundation for long-term organizational change.

On the other hand, Satria (2025) highlighted that green work engagement has transformational potential in strengthening green leadership and building an inclusive organizational culture, particularly in complex sectors such as healthcare—the principles of which can be replicated in agribusiness sectors such as palm oil. Lestari (2025) also showed that green employee engagement can foster an innovative and collaborative organizational culture, which is an important foundation for long-term change strategies in MSMEs and labor-intensive industries.

Sulistiono (2019) Confirmed that employee engagement has a direct impact on organizational commitment and job satisfaction, two key elements in maintaining sustainable

performance in the plantation sector. Idrus (2024) found that green work engagement can strengthen the effect of green HRM on performance, making employee engagement a catalyst for behavioral and system changes. Meanwhile, Handayani (2024) emphasized that effective GHRM implementation requires structural support, including employee empowerment and environmental education, so that employee engagement can truly accelerate the green transformation agenda in business.

Organizational Change in the Implementation of Green Initiatives

The implementation of green initiatives in organizations not only impacts technical or operational policies, but also triggers comprehensive systemic changes, ranging from work structures to organizational culture. The table above summarizes the different types of changes that occur in organizations based on findings from 19 recent studies. These changes include improved environmental performance and green innovations, integration of policies into corporate strategy, shifts in organizational culture, adoption of green technologies, transformation of production systems, and adaptation to external challenges.

Table 3. Changes in the Organization When Implementing Green Initiatives

No.	Reference Source	Changes that Occur
1	(Hendarjanti, 2022; Hendarjanti & Nawangsari, 2023)	Improving Green Performance through Green HRM and Green Innovation
2	(Razali & Vasudevan, 2024; Shahrulnizam et al., 2024)	Integration of Green HRM Policy in Corporate Strategy
3	(Khaddage-Soboh et al., 2024; Mering, 2024)	Improved Environmental Performance through CSR and Green Culture
4	(Niramitsrichai et al., 2021; Ramli et al., 2025)	Adoption of Certification and Green Technology
5	(Gazi et al., 2025; Trisyulianti et al., 2022)	Circular Economy Implementation
6	(Alkhozaim et al., 2024)	Sustainable Work Environment Transformation
7	Soomro et al. (2024)	Improving Environmental Performance Amid External Challenges
8	(Idrus, 2024; Satria et al., 2025)	Systemic transformation through green work engagement and technology integration supported comprehensive changes to the organizational structure and significantly improved employee performance.
9	(Handayani et al., 2024; Lestari & Anjaningrum, 2025; Sulistiono et al., 2019)	The establishment of an innovative and collaborative environment-based culture that strengthens organizational commitment, GHRM socialization, and employee empowerment in driving long-term sustainability.

Source: Data Processed (2025)

Improved green performance is one of the most tangible impacts of implementing green initiatives in organizations, as shown by (Hendarjanti, 2022; Hendarjanti & Nawangsari, 2023). Through Green Human Resource Management (GHRM) approaches and green innovations, companies become more active in reducing their environmental footprint while empowering employees through sustainable training and incentives. This not only improves energy efficiency and reduces waste, but also strengthens the company's image.

Research by Benn (2015) even shows that employee engagement in green programs can improve morale and productivity. In addition, studies by Razali (2024) and Shahrulnizam (2024) show that the integration of GHRM into corporate strategy creates profound structural changes. When sustainability becomes part of the organization's vision and mission, green values are

embedded in the work system across units. This is in line with the findings of Benn (2006) who stated that the effectiveness of organizational change is determined by the depth of integration of sustainability values in the managerial system.

Organizational culture change is also an important aspect of green transformation, as noted by (Khaddage-Soboh et al., 2024; Mering, 2024). Green culture is created through internal communication, transformational leadership, and consistent habituation of sustainable behaviors. Employees feel engaged as part of the organization's larger goals, not just technical implementers. Shahriari (2023) emphasized that the creation of a green culture strengthens long-term commitment to organizational change.

In addition, change is also seen in the adoption of green technologies and sustainability certifications such as RSPO, described by (Niramitsrichai et al., 2021; Ramli et al., 2025). This process changes production patterns and cross-functional collaboration within the organization. According to Tu and Wu (2021), this green technology transformation also strengthens the organization's learning process, making it more adaptive and open to innovation.

Business model change through the implementation of circular economy is a strategic step raised by (Gazi et al., 2025; Trisyulianti et al., 2022). Shifting from a linear approach to a system that recycles resources requires significant adjustments, from product design to internal logistics. However, these initiatives are proven to improve cost efficiency and supply chain resilience, while driving more sustainable innovation. Geissdoerfer (2023) emphasize that the circular economy is a key driver of green business model change. At the same time, the work environment is also undergoing a transformation.

Alkhozaim (2024) suggested that as organizations plan, they design and develop workspaces with a green-based lifestyle, like bringing digitized job (paperless), available recycling services, and an eco-friendly mode of transportation. This enhances value alignment between organizations and employees. A workplace with sustainability encouragement will be able to generate an innovative and healthy work climate (Jurik & Cavender, 2016).

Furthermore, companies adopting green initiatives have been found to be more resilient against external stressors such as pandemic events and economic downturns (Soomro et al., 2024). Companies have a greater flexibility and resilience in the face of risk when sustainability principles are integrated into their core strategies. Wahyuni (2024) noted that sustainability-based organizations have more adaptive and long-term risk management systems. Green initiatives mean comprehensive transformation across every facet of the organization, from strategy to individual behavior. According to Rees (2021), this type of transformation leads not merely to sustainability, but also economic advantage and international reputation. Green change is only effective to the extent that environmental values are internalized by all elements of the organization (Harris & Crane, 2002).

Satria (2025) highlighted the role of green work engagement as a driver for systemic change via green leadership and formal structures and therefore, employee (i.e., individual) engagement is a keystone element of institutionalization toward sustainability. According to Lestari & Anjaningrum (2025), green employee engagement also fosters innovation in organizational culture, and enhances competitiveness through environmentally friendly collaboration at work.

The results of Sulistiono (2019) confirmed that employee engagement has a considerable influence on organizational commitment, an essential factor in supervising environmental sustainability implementation. GHRM demonstrated a positive impact on employee performance further confirmed by Idrus (2024) reporting that green work engagement enhances the relationship between GHRM and worker productivity, exemplifying organizational efficiency and risk reduction via natural resources. Handayani (2024) further stated that organizational commitment, internal socialization, and employee empowerment determine GHRM success where employee engagement was the primary key in driving green and sustainable organizational change. Thus, green initiatives represent not just a technological approach but the basis of a paradigm shift in sustainable management in organizations.

HR's role in managing organizational change towards a green culture

The role of Human Resource (HR) in managing change towards a green culture is very strategic and multidimensional. Based on the table above, HR not only acts as an implementer of green policies, but also as a transformation agent that bridges the organization's sustainability vision with employees' daily behaviors. Razali (2024) emphasized the importance of implementing Green HRM (GHRM) practices such as green recruitment, sustainability training, and environmental indicator-based performance evaluation. Through this approach, HR creates a work environment that internalizes green values from the beginning of the HR management process. Furthermore, Hendarjanti (2022) and Hossain (2022) emphasized that HR also plays a role in strengthening *green commitment* through visionary and inspirational leadership, which is able to instill sustainability values in the mindset of all elements of the organization.

Table 4. HR's Role in Managing Change Toward a Green Culture

No.	Reference Source	HR role
1	Razali et al. (2024)	Implementation of Green HRM Practices
2	Hendarjanti (2022); Hossain et al. (2022)	Strengthening Green Commitment through Leadership
3	(Gazi et al., 2025; Shahrulnizam et al., 2024)	Alignment of GHRM with Organizational Strategy
4	Khaddage-Soboh et al. (2024)	Development of Green Behavior and Commitment
5	(Ramli et al., 2025; Trisyulianti et al., 2022)	Resource Management Based on Circular Economy
6	(Alkhozaim et al., 2024)	Strengthening Green Innovation through Organizational Support
7	(Najib et al., 2021; Soomro et al., 2024)	Socialization of Green Program and Challenge Handling
8	(Idrus, 2024; Satria et al., 2025)	HR acts as a facilitator of systemic transformation by encouraging green work engagement and integrating technology and green talent management to improve performance and environmental awareness.
9	(Handayani et al., 2024; Lestari & Anjaningrum, 2025; Sulistiono et al., 2019)	HR develops an innovative and sustainable organizational culture through employee empowerment, environmental education, and socialization of GHRM as a foundation for organizational behavior change.

Source: Data Processed (2025)

HR's strategic role in managing change towards a green culture is reflected in its ability to align Green Human Resource Management (GHRM) practices with key organizational strategies. HR is not only involved in sustainability planning and the development of green performance indicators, but also encourages long-term environmental behavior and commitment through training, green innovation awards, and strengthening internal CSR (Gazi et al., 2025; Khaddage-Soboh et al., 2024; Shahrulnizam et al., 2024). In the context of the circular economy, HR also plays a role in repositioning work functions, developing waste management competencies, and strengthening innovation through a flexible and supportive work environment (Alkhozaim et al., 2024; Ramli et al., 2025; Trisyulianti et al., 2022). HR is also a driver of change communication and mitigation of cultural resistance that hinders green transformation (Najib et al., 2021; Soomro et al., 2024).

Furthermore, other studies show that HR is a key lever in shaping an adaptive and sustainable organizational culture. Akpa (2022) emphasized the importance of green work systems from recruitment to retention, while Park (2012) highlighted participatory approaches in enhancing employee emotional engagement. Sharma (2021) and Alshammari (2023) emphasized that a work environment that supports green innovation and continuous learning is crucial for cultural change.

Ansari (2023) and Islam (2021) emphasized the importance of intrinsic values and green leadership facilitated by HR. In the long term, Castro (2025) showed that HR's strategic engagement is crucial to the successful achievement of the SDGs and the transition towards circular-based organizations. Therefore, HR has a central position not only as an administrative manager, but as the main architect of organizational culture transformation towards sustainability.

Based on the findings of Satria (2025) and Idrus (2024), HR is not only tasked with administrative duties, but also as an agent of systemic change. They facilitate green work engagement through environment-based talent development, green servant leadership, and the adoption of innovative technologies and frameworks (such as GreenEd and 5R principles). This role is important for creating a work environment that is responsive to sustainability issues and improving organizational performance.

Meanwhile, from the studies of Lestari (2025), Sulistiono (2019), and Handayani (2024), the role of HR appears crucial in building a collaborative and innovative organizational culture through employee empowerment, strengthening the growth mindset, and socializing GHRM programs. Environmental education and intensive internal communication are key so that all elements of the organization understand and are involved in the implementation of green values. That way, HR is no longer just a support unit, but a driving force capable of integrating sustainability values into the organization's identity through structured policies, training, and work behavior patterns.

Previous literature on green engagement as part of the change management process

Based on 19 literature studies that explicitly show how employee involvement in green practices (green engagement) plays an important role in the organizational change management process. From a human resource management perspective, green engagement is positioned as a strategic tool in internalizing sustainability values throughout the organization. For example, Razali (2024) and Shahrulnizam (2024) emphasize the implementation of Green HRM as an approach to shaping a sustainable culture through training, recruitment, and compensation that supports environmentally friendly behavior. These changes not only create environmental efficiency, but also strengthen employee loyalty and motivation in the face of organizational transition.

Table 5. Literature Studies that Show Green Engagement as Part of the Change Management Process

No.	Reference Source	The Role of Green Engagement in Change Management	Description
1	Razali (2024)	Implementation of Green HRM to improve employee engagement.	Green recruitment, training and compensation practices encourage active employee participation in environmental initiatives, strengthening the organization's transition to sustainability.
2	Hendarjanti et al. (2022)	Green Commitment and Green Innovation as the foundation of change.	Employee commitment to the environment through Green HRM and green innovation is the basis for transforming business strategies to environmentally friendly practices.
3	Mering et al. (2024)	Integration of Green Value Strategy and CSR to improve environmental performance.	CSR programs and green value strategies strengthen organizational culture, encouraging employee participation in sustainable practices.
4	Hendarjanti et al. (2023)	Green Innovation as a mediator of competitive change.	Green innovation (e.g., low-emission technologies) is key in achieving sustainable competitive advantage

No.	Reference Source	The Role of Green Engagement in Change Management	Description
			through employee engagement.
5	Niramitsrichai et al. (2021)	Multi-stakeholder participation in the RSPO certification program.	Employee engagement in certification and operational efficiency supports organizational change towards economic, social and environmental sustainability.
6	Shahrulnizam et al. (2024)	Integration of GHRM in corporate strategy to overcome cultural resistance.	GHRM practices (green recruitment, environmental training) establish a sustainable culture and ensure long-term change.
7	Khaddage-Soboh et al. (2024)	Cultural transformation through CSR and transformational leadership.	Sustainability-focused leadership and CSR programs increase employee engagement in green practices.
8	Trisyulianti et al. (2022)	Circular economy-based performance management system.	Employee engagement in circular resource allocation supports systemic change towards efficiency and sustainability.
9	Gazi et al. (2025)	Reduction of ecological footprint through GHRM practices.	GHRM implementation increases employee participation in environmental initiatives, reduces costs, and strengthens the organization's reputation.
10	(Alkhozaim et al., 2024)	Green Talent Management to build a green culture.	Eco-oriented talent management encourages employee participation in green performance as part of business transformation.
11	Hossain et al. (2022)	Top management commitment and green culture.	Top management support for GHRM and green culture strengthens employee engagement in green practices.
12	Ramli et al. (2025)	Adoption of green technology and energy efficiency.	Employee engagement in green technology adoption is supported by organizational awareness to achieve environmental transformation.
13	Najib et al. (2021)	Leader support for continuous innovation in MSMEs.	Employee engagement in continuous innovation (e.g., food processing) is facilitated by leader support for strategic change.
14	Soomro et al. (2024)	Green practices and environmental CSR amid pandemic challenges.	Employee engagement in environmental CSR improves organizational performance, even under challenging external conditions.
15	Satria et al. (2025)	Green Work Engagement as a driver of systemic change	Proactive employee engagement in green practices is supported by green leadership, green HRM, and technology integration as part of sustainable organizational transformation.
16	Lestari & Anjaningrum et al. (2025)	Innovative culture as a result of green engagement	Green work engagement shapes a collaborative and innovative work culture, which encourages strategic adaptation of the organization in the face of environmental changes.
17	Sulistiono et al. (2019)	Employee engagement strengthens organizational	Employee engagement increases organizational satisfaction and loyalty, which are important cornerstones in the

No.	Reference Source	The Role of Green Engagement in Change Management	Description
		commitment	change process towards a greener work culture.
18	Idrus et al. (2024)	Green engagement as moderator of GHRM influence on performance	Employee engagement in green practices amplifies the positive impact of GHRM on performance, making engagement a driver of environmentally based organizational change.
19	Handayani et al. (2024)	Environmental socialization and education as HR change strategy	GHRM successfully manages change through employee engagement reinforced by environmental education, green training and human resource empowerment.

Source: Data Processed (2025)

Several studies underline that employee engagement in green initiatives acts as a mediator in strategic change. Hendarjanti (2022) and Hendarjanti & Nawangsari (2023) highlighted the importance of green commitment and innovation as the foundation of transformation that leads organizations to sustainable competitive advantage. On the other hand, the studies of Mering (2024) and Khaddage-Soboh (2024) expanded the scope of engagement to include green value strategies and CSR programs as a platform for cultural and behavioral transformation of employees. Research by Besieux (2018) corroborates that transformative leadership and employee engagement in CSR initiatives have a positive correlation to changes in organizational values and behavior.

Furthermore, green engagement is also reflected in employees' direct participation in systemic programs such as RSPO certification Niramitsrichai (2021), circular economy Trisyulianti (2022), and green technology adoption (Ramli et al., 2025). These studies show that organizational change does not only take place at the structural level, but is also strongly influenced by micro-individual involvement in the transition process. Gazi (2025) and Alkhozaim (2024) demonstrated that such engagement can also lower operational costs and strengthen reputation, especially through Green Talent Management approaches that prepare human resources with sustainability competencies.

According to Begum (2022), change can only take root when employees are involved in process innovation and green decision-making. Support from top management is also an important catalyst that accelerates the effectiveness of employee engagement in the change process (Hossain et al., 2022; Najib et al., 2021). This is in line with the findings of Soomro (2024) who showed that employee engagement in environmental CSR practices still contributes to organizational performance, even amid challenges such as a pandemic. Research from Irimiás (2020) confirms that green engagement integrated in a change management system will create an organizational structure that is more flexible and ready to face market dynamics. In addition, Afsar (2020) stated that employee engagement in the green agenda strengthens internal trust and commitment to the organization's mission.

Satria (2025) Showed that green work engagement becomes a driver of systemic change in organizations, especially when supported by green leadership, green HRM, and technology integration that strengthens institutional capacity in the face of sustainability pressures. Lestari & Anjaningrum (2025) added that employee engagement in green practices contributes to the formation of an adaptive innovative culture, encouraging changes in values and collective behavior in small and medium organizations.

The findings of Sulistiono (2019) emphasize that employee engagement has a major effect on organizational commitment and job satisfaction, two important components in ensuring the sustainability of work culture transformation towards a greener direction. Idrus (2024) underlined the role of green engagement as a moderator that strengthens the relationship between green HRM practices and improved employee performance, making it an important

catalyst in organizational behavior change. Meanwhile, Handayani (2024) showed that HR can effectively manage green change through program socialization and environmental education, which strengthens employee engagement in the long-term sustainability agenda.

Impact of Green Employee Engagement (GEE) on Operational Efficiency of National Palm Oil Mills

Green Employee Engagement (GEE) has a direct impact on improving the operational efficiency of palm oil mills through various mechanisms of behavior change, process improvement, and strengthening sustainability values in daily activities. Idrus (2024) study shows that employee engagement in green HRM practices strengthens operational performance because it increases concern for energy efficiency, waste management, and more efficient use of resources. This is reinforced by Satria (2025) who emphasized the role of GEE in driving systemic change in high-risk industry sectors such as healthcare and agribusiness, including palm oil. By proactively engaging employees, palm oil companies can reduce operational leakage, improve compliance with environmental standards, and lower production costs through energy efficiency and participatory waste management.

Apart from internal efficiency, GEE also encourages compliance with sustainability policies and certifications such as the RSPO (Roundtable on Sustainable Palm Oil), which is one of the important instruments in streamlining the governance of the Indonesian palm oil industry. Studies by Niramitsrichai (2021) and Ramli (2025) show that employee engagement in environmental certification programs not only improves their understanding of sustainable operational standards, but also accelerates the adaptation of green technologies such as the use of biomass energy or digital monitoring systems for liquid waste. These initiatives have a knock-on effect on improving the productivity and competitiveness of Indonesia's palm oil exports. It is also relevant to the spirit of MOA 11/2020, which encourages palm oil industry players to implement sustainable agricultural practices through the Indonesian Sustainable Palm Oil Plantation Certification System (ISPO).

Nationally, Green Employee Engagement supports the Indonesian government's strategic policies in achieving decarbonization and resource efficiency targets. Employee engagement in environmentally friendly production processes contributes to the fulfillment of sustainability indicators set out in the Sustainable Development Goals (SDGs), specifically SDG 12 (Responsible Consumption and Production) and SDG 13 (Addressing Climate Change).

Handayani (2024) Highlighted that with sustainable training and environmental education, organizations can create an efficient work system while aligning with national policies. On the other hand, RSPO Indonesia actively encourages best practices at the operational level through indicators such as GHG calculation, waste handling, and water management which can only be achieved with the active involvement of workers in the field.

In the local context, synergies between GEE and regulations such as MOA No. 11/2020, the RSPO program, and increased corporate awareness of social and environmental responsibility encourage a more adaptive, transparent and efficient organizational culture. In addition, GEE practices also help companies minimize the risk of social conflicts and environmental violations that lead to fines or restrictions on market access. Thus, GEE not only strengthens technical efficiency, but also expands institutional capabilities in managing risks and ensuring long-term sustainability. These findings confirm that the green engagement approach is an important foundation for operational reform in the national palm oil industry in the green economy era.

CONCLUSION

This study confirms that green employee engagement plays a strategic role in enhancing environmental sustainability and operational performance in the palm oil industry. Employee involvement in green practices strengthens Green Human Resource Management (GHRM), drives organizational culture transformation, supports green technology adoption, and improves process efficiency. Theoretically, this research proposes a synthesis model positioning green employee engagement as a nexus between GHRM, cultural transformation, and sustainability outcomes, while integrating Stakeholder Theory to explain how employee-level engagement

translates into firm-level performance. Practically, the findings highlight the importance of institutionalizing green engagement through structured HR policies, including environmental training, green performance evaluation, and sustainable talent management, as well as advocating for policy frameworks that support sustainability-driven organizations.

However, this study is limited to the palm oil sector and relies on secondary data, so its generalizability requires contextual consideration. Future research is recommended to expand into other agribusiness sectors and apply quantitative or longitudinal approaches to examine long-term impacts. Further exploration of emerging issues such as ESG compliance, green digital transformation, and psychological factors—such as green identity and pro-environmental behavior—can provide deeper insights into the mechanisms of green engagement in organizational change.

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AUTHOR CONTRIBUTION STATEMENT

All authors contributed significantly to this research. Posma Sinurat conceptualized the study, designed the research framework, and led the writing of the manuscript. Pawenary contributed to data collection, literature screening, and systematic review process. Safuan was responsible for data analysis, synthesis of findings, and interpretation of results. Edi Hamdi contributed to manuscript revision, critical review, and final approval of the version to be published. All authors have read and agreed to the published version of the manuscript.

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