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Research Article

Green Financing, Innovation, and Green on Sustainability Performance: Top Management Support Moderation

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Abstract. Climate change and resource constraints encourage companies to adopt green strategies to improve sustainability performance. This study uses the PRISMA protocol-based Systematic Literature Review (SLR) to analyze the influence of green financing, green innovation, and green human resource management (GHRM) on sustainability performance, with top management support as a moderating variable. Of the initial 100 articles (2021–2025) in databases such as Scopus and the Web of Science, 25 selected articles were thematically analyzed. The results show that the three green variables have a positive effect on sustainability performance through environmentally friendly project funding, efficient innovation, and sustainable work culture. Top management support strengthens this relationship by providing strategic resources and commitment. The research identifies gaps such as lack of integration of variables and implementation challenges, as well as recommends integrated strategies for practice and future literature development.

Keywords: Green financing, green innovation, green human resource management, sustainability performance, top management support, systematic literature review

INTRODUCTION

In recent years, the challenges of climate change, environmental degradation, and increasingly limited natural resources have driven companies across the globe to adopt more sustainable business practices. The concept of sustainability is now seen not only as a form of corporate social responsibility but also as a crucial part of business strategy to ensure long-term corporate sustainability (Sumarjo et al., 2026). Demands from governments, investors, consumers, and international organizations require companies to balance economic, social, and environmental aspects in all their business activities. Therefore, many companies have begun implementing various environmentally friendly practices, such as green financing, green innovation, and green human resource management (GHRM), to improve their sustainability performance (Xie, 2023).

Globally, investment in the green sector has seen a significant increase in recent years. Green financing has become a key instrument used by companies to support sustainable projects, energy efficiency, and carbon emission reduction. Green financing enables companies to access funding that is more oriented towards sustainable development, thereby increasing their competitiveness in the green economy era (Tripopsakul, 2025). Furthermore, green innovation is also rapidly developing as a corporate strategy to create more environmentally friendly products, processes, and technologies. Green innovation is considered capable of increasing operational efficiency, reducing waste, and strengthening corporate sustainability performance (Ali & Alrifae, 2026).

The reality on the ground shows that many companies are beginning to integrate green practices into their business strategies. However, the implementation of green financing, green innovation, and GHRM varies from company to company. Some companies have successfully improved sustainability performance through green transformation, while others still face various obstacles such as limited funding, lack of technological innovation, employee resistance, and weak management commitment. This situation indicates that the success of green strategy implementation is influenced not only by company resources but also by top management support (Lawter & Garnjost, 2025).

Furthermore, previous research tends to examine green financing, green innovation, and GHRM variables separately. Research integrating these three variables into a single research model is limited, particularly with the inclusion of top management support as a moderating variable. Most studies also employ a quantitative empirical approach, resulting in few studies employing a systematic literature review (SLR) approach to comprehensively map the relationships between variables based on recent international research (Chowdhury et al., 2025).

Based on these phenomena and research gaps, this paper aims to systematically analyze and examine the influence of green 2 financing, green innovation, and green human resource management on sustainability performance with top management support as a moderating variable. This study uses a Systematic Literature Review (SLR) approach to identify research trends, relationships between variables, research gaps, and opportunities for future research development (It et al., 2026). The results of this study are expected to provide theoretical contributions to the development of sustainability management literature and provide practical recommendations for companies in improving sustainability performance through the implementation of integrated green strategies (Lawter & Garnjost, 2025).

LITERATURE REVIEW

1. Green Financing

Green financing has become a key instrument in supporting the transition to a sustainable economy, particularly in global efforts to reduce carbon emissions and increase investment in environmentally friendly sectors. Green financing is defined as a financing mechanism allocated to projects that have a positive impact on the environment, such as renewable energy, energy efficiency, and waste management (Financing et al., 2022). In recent years, this concept has evolved not only as a financial instrument but also as a key component of sustainable development strategies, linking the financial sector to global environmental agendas such as the Sustainable Development Goals (SDGs) (Xie, 2023).

However, the implementation of green financing still faces several challenges, such as limited understanding of green financial instruments, perceived high investment risks, and a lack of uniform standards for measuring environmental impact (Kanika Thapliyal, Chandan Gupta, 2025). This situation indicates that while green financing has significant potential to support sustainability, its effectiveness depends heavily on the synergy between government policies, the financial sector, and organizational readiness to adopt a green approach (Desalegn, 2022).

2. Green Innovation

GI is an important element in environmental management that companies and other institutions need to pay attention to. Environmental innovation. GI is concerned with the creation of environmentally friendly products and processes through the implementation of various effective organizational practices. Specifically, this includes the use of raw materials. 3 sustainable, as well as efforts to minimize the use of these materials in the product design process (Huayi, li Kuo et al., 2022).

Through environmentally sustainable principles and efforts to reduce greenhouse gas emissions, the consumption of water, electricity, and other resources has generally shown an upward trend in recent years. Furthermore, environmental degradation has become a serious threat to human survival. Many organizations and regions have implemented the GI concept for environmental protection and economic development (Chang et al., 2024).

Sustainable development. Environmental sustainability and economic profitability are crucial. Green initiatives can help companies achieve a sustainable competitive advantage. These advantages include: An effective GI system can enhance a company's market position, attract customers, and provide long-term benefits. These services can help companies gain a competitive advantage. Because of these benefits, GI is a top priority for management (Al-shammari et al., 2022).

3. Green Human Resource Management

Green Human Resource Management (GHRM) has become an important strategy for integrating environmental responsibility into various human resource activities. This strategy encompasses various environmentally friendly practices, such as recruiting environmentally conscious employees, training aimed at increasing employee environmental awareness, performance appraisals that take environmental aspects into account, and incentive systems that support environmentally friendly practices. All of these are expected to encourage employees to behave in an environmentally friendly manner (Renwick, DWS, Redman, T., & Maguire, n.d).

GHRM can also improve overall organizational performance, as human resource management processes become more aligned with environmental goals. Thus, GHRM helps create a workforce ready to participate in various activities aimed at preserving the environment. Recruiting environmentally conscious employees is a crucial step in implementing GHRM (Fang et al., 2022).

The role of GHRM is to ensure that human resource management practices align with the company's business sustainability goals. GHRM contributes to improving various aspects of a company's operations, such as employee morale, employee retention rates, and the quality of relationships with stakeholders (Ningly & Rahmadhani, 2025). These employees share the same values as the organization, thus committing to supporting efforts aimed at preserving the environment. Training aimed at increasing employee environmental awareness is also crucial. With such training, employees will have the knowledge and skills necessary to implement environmentally friendly practices in their daily work (Arshad et al., n.d.).

Green Human Resource Management (GHRM) has become an increasingly important strategic approach to supporting organizational sustainability in the green economy era. GHRM integrates environmental principles into all human resource management functions, such as recruitment, training, performance appraisal, and reward systems. Recent literature has viewed GHRM not only as an internal company policy but also as a crucial instrument for driving organizational transformation toward more sustainable and environmentally friendly business practices (Zihan et al., 2024).

Research over the past five years has shown that GHRM has a significant positive impact on organizational sustainability performance, both from an environmental, social, and economic perspective. GHRM implementation enables companies to establish a more environmentally conscious work culture by increasing employee awareness, developing green competencies, and strengthening pro-environmental behaviors in the workplace. This ultimately contributes to improving the organization's overall environmental performance. Furthermore, GHRM has also been shown to increase the effectiveness of corporate sustainability strategies through greater employee engagement in environmentally friendly activities (Tessema, 2025).

4. Sustainability Performance

Sustainable performance refers to a company's economic, environmental, and social performance. These aspects are assessed and monitored through various methods. Most research on corporate sustainable performance focuses on the relationships between these aspects, for example, environmental, social, and economic aspects (Huayi, Li Kuo et al., 2022).

Economic performance relates to financial management, environmental performance helps mitigate environmental issues, and social performance reflects how a company treats its employees, stakeholders, and the well-being of employees, society, and the community. Systematic measurement of sustainable performance, taking into account the interactions between the various elements within the system (business, society, and the environment), is crucial for determining whether a company's activities have a positive impact and contribute to the principles of sustainable development. Companies need to implement sustainable management systematically to achieve a balance between the environment, society, and the economy. To determine whether sustainable management activities are successful in achieving sustainable development goals, an effective measurement system is required (Huayi, Li Kuo et al., 2022).

Environmental sustainability performance generally reflects a company's efforts to wisely manage natural resources and strive to achieve greater levels of environmental sustainability. This sustainability performance also encompasses the impact of various environmental initiatives undertaken by the company, such as efforts to protect natural resources, prevent pollution, and reduce waste. At the company level, this sustainability performance is closely related to environmental business objectives, such as reducing greenhouse gas emissions, increasing resource efficiency, and reducing water consumption and waste production (Abidin, R., Abdullah, R., Hassan, 2022).

5. Top Management Support Mediation

The effectiveness of green financing, green innovation, and GHRM is significantly influenced by the role of Top Management Support (TMS). Top management support is a key factor in determining the successful implementation of sustainability strategies because management is responsible for providing resources, establishing policy direction, and creating an organizational culture that supports green practices. The literature shows that without top management support, the implementation of green financing and GHRM often fails to run optimally, even though they are already designed into formal organizational policies (Mohammad et al., 2025).

Support from top management increases employee confidence, helping them in formulating policies, standards and goals. 6 Clearly defined. Support from top management also plays a role in creating a harmonious work environment and assisting in determining project objectives. This support is crucial for project managers and team members, including team training, effective communication, and strategies used in project implementation (Huayi, Li Kuo et al., 2022).

Furthermore, Top Management Support also acts as a mediating variable, strengthening the relationship between green financing, green innovation, and GHRM on sustainability. Strong managerial support can increase the effectiveness of green policy implementation, accelerate innovation adoption, and ensure optimal use of green financing. Thus, TMS is a crucial element linking organizational strategy with actual implementation on the ground in achieving green financing sustainability (Setyadi et al., 2025).

RESEARCH METHODS

This study uses the Systematic Literature Review (SLR) method because it ensures the most efficient and high-quality approach to explore and evaluate extensive literature. A Systematic Literature Review (SLR) is used to assess and interpret all available research in a particular research area or phenomenon of interest where the literature review can strengthen the research foundation in the area of interest. SLR is a more authentic and verifiable source that combines a more comprehensive and unbiased search. It identifies, evaluates, and analyzes various previous research results related to the influence of green financing,green innovation, Andgreen human resource management tosustainability performancewithtop management supportas a moderating variable. This approach is also widely used in recent literature to analyze the relationships between variables in the context of organizational sustainability because it can reduce selection bias and increase the validity of research findings (Hossain et al., 2022).

The SLR process in this study follows the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol, which consists of several main stages: identification, screening, eligibility, and inclusion of articles. In the identification stage, articles were searched from reputable international databases such as Scopus, Web of Science, ScienceDirect, SpringerLink, and MDPI using keywords such as "green financing," "green innovation," "green 7 HRM", "top management support", and "sustainability". The literature used was limited to publications from 2021 to 2025 to ensure relevance to the latest developments in the field of green management and sustainability (Jamal et al., 2021).

At the screening stage, articles that are not relevant to the research topic, Articles not in English and not open access (free to download) were excluded from the selection process. Furthermore, during the eligibility stage, articles were analyzed based on their abstracts and full content to ensure their relevance to the research variables, which included green financing, green innovation, green human resource management, green financing sustainability, and top management support. Only articles meeting the inclusion criteria were used in the final analysis stage. The data analysis technique in this SLR was conducted using a thematic analysis approach, grouping research results based on the patterns of relationships between variables (Peng et al., 2024).

1. Initial Identification In the initial stage, researchers conducted a literature search using predetermined keywords in international databases. The initial search

yielded approximately 100 documents related to the themes of green financing, green innovation, green human resource management, sustainability performance, and top management support.

2. Year Filtering Next, a filtering process was conducted based on publication year. The filter was applied to articles published between 2021 and 2025 to ensure that the research used was up-to-date and relevant to developments in global sustainability issues. After the year filtering process, the remaining articles were reduced to 50.
3. Inclusion Criteria

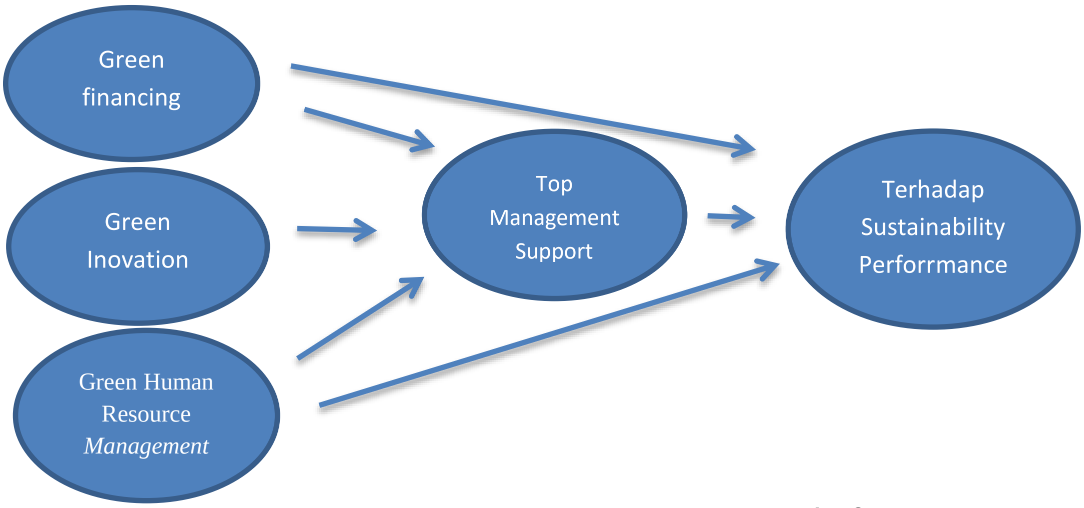
a. Selected articles must meet several inclusion criteria, namely: Published in an English-language international journal;
b. Characteristicpeer-reviewed;
c. Indexed in reputable international databases such as ScienceDirect;
d. Discuss at least two main research variables, namelygreen financing, green innovation,green human resource management,sustainability performance, ortop management support;
e. Using an empirical approach or systematic literature review relevant to the research objectives. Meanwhile, articles that are not directly related to the research topic, duplicate articles, proceedings, and articles that do not provide full access (full text) are excluded from the analysis process.

4. Data Extraction

The final stage involved a thorough reading of the abstracts, methods, research results, and conclusions of each selected article. Based on the highest level of relevance to the relationships between research variables, 25 final articles were selected, which served as the primary sources for the systematic literature review analysis.

Data from selected articles were then analyzed descriptively and comparatively to identify research trends, relationships between variables, differences in previous research results (research gap), as well as opportunities for future research development related to the influence of green financing, green innovation, and green human resource management on sustainability performance with top management support as a moderating variable.

RESULTS AND DISCUSSION



1. The Influence of Green Financing on Sustainability Performance

According to research, green financing has a positive and significant impact on a company's sustainable business performance because it can improve the implementation of corporate social responsibility (CSR), operational efficiency, and support sustainability-oriented business activities. Green financing has a positive influence on a company's sustainability performance. Green financing is an important instrument in supporting sustainability-oriented business activities because it can provide funding sources for environmentally friendly projects, such as energy efficiency, renewable energy, carbon emission reduction, and waste management. Companies that implement green financing tend to have better capabilities in improving operational efficiency while strengthening competitiveness in the green economy era. In addition, the implementation of green financing also helps companies meet the demands of investors, regulators, and the public who are increasingly paying attention to environmental aspects in company business activities. However, several studies show that the implementation of green financing still faces various obstacles, such as the high risk of green investment, limited access to financing, and the lack of uniform global standards for measuring environmental impact. Therefore, the effectiveness of green financing is greatly influenced by company readiness, financial sector support, and government policies in encouraging sustainable business practices.

2. The Influence of Green Financing on Sustainability Performance

Green financing and green innovation also play a crucial role in improving a company's sustainability performance. Green innovation is related to the development of more environmentally friendly products, processes, technologies, and operational systems. The implementation of green innovation can help companies reduce energy use, minimize production waste, and increase the efficiency of natural resource use. Companies that successfully implement green innovation optimally tend to have better environmental and economic performance than those that have not yet implemented green innovation to its full potential. Green innovation also helps companies create more competitive products that meet the needs of a market that is increasingly concerned about environmental issues. However, implementing green innovation requires significant investment costs, technological readiness, and organizational capabilities to undertake business transformation. Therefore, the success of green innovation is greatly influenced by the readiness of resources. corporate power and management support in driving a culture of sustainable innovation.

3. The Influence of Green Human Resource Management (GHRM) on Sustainability Performance

Green Human Resource Management (GHRM) has also been shown to have a positive impact on a company's sustainability performance. GHRM helps companies build a more environmentally conscious organizational culture through various green-based human resource practices, such as green recruitment, green training, green performance appraisals, and green reward systems. Through the implementation of these practices, companies can increase employee environmental awareness and encourage more environmentally friendly work behaviors. Furthermore, GHRM implementation can also increase employee engagement, loyalty, and productivity in support of the company's sustainability program. Companies that implement GHRM effectively tend to more easily build a work culture that supports sustainability because all elements of the organization are involved in environmentally friendly activities. However, the implementation of GHRM still faces several challenges, such as resistance to changes in organizational culture, a lack of employee green competency, and limited training related to environmental sustainability. Therefore, companies need to integrate human resource policies with the company's overall sustainability strategy.

4. The Role of Top Management Support as a Moderating Variable

Top management support plays a crucial role in strengthening the relationship between green financing, green innovation, and GHRM and sustainability performance. Top management support is a key factor in the successful implementation of green strategies because management has the authority to determine policy direction, provide resources, and build an organizational culture that supports sustainability. Companies with high levels of management support tend to be more successful in implementing green financing, accelerating the adoption of green innovation, and increasing the effectiveness of GHRM compared to companies with low levels of management support. Furthermore, top management support can also increase employee commitment and participation in implementing various company sustainability programs. Conversely, weak management support can lead to less than optimal implementation of green strategies, even if the company already has a sound sustainability policy. Therefore, top management support is crucial. become a strategic factor that strengthens the successful implementation of green practices in improving the company's sustainability performance.

Overall, the discussion results indicate that green financing, green innovation, and green human resource management are important factors in improving a company's sustainability performance. These three variables are interrelated and form an integrated sustainability strategy. Green financing provides funding support, green innovation encourages the creation of environmentally friendly technologies and processes, and GHRM plays a role in building a work culture that supports sustainability. The successful implementation of these three strategies will be optimal if supported by strong top management support. Therefore, companies need to integrate aspects of finance, innovation, and green-based human resource management into their business strategies to achieve sustainable performance.

CONCLUSION

Based on the research results, it can be concluded that green financing, green innovation, and green human resource management (GHRM) play a significant role in improving corporate sustainability performance. Green financing, green innovation, and green human resource management (GHRM) positively influence corporate sustainability performance. These three variables help companies increase efficiency, reduce environmental impact, and support long-term business sustainability.

Furthermore, top management support plays a crucial role in strengthening the implementation of green strategies through policies, resources, and organizational culture. Therefore, the implementation of an integrated green strategy supported by strong management can optimally improve a company's sustainability performance.

SUGGESTION

a. For Banking Practitioners:

Banks need to increase the implementation of green financing through environmentally friendly financing products and support companies in mplementing green innovation and GHRM to improve sustainability performance.

b. For Regulators:

Regulators are expected to strengthen policies, standards, and incentives related to green financing and sustainable business practices to ensure optimal implementation of sustainability within companies.

c. For Future Researchers:

Further research is recommended to use empirical methods with a wider scope of sectors and variables to obtain more comprehensive results regarding sustainability performance.

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