Imran Hossain
Indrajit Ghosal
A. K. M. Mahmudul Haque *Editors*

Green Policies for a Sustainable World

Springer

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A. K. M. Mahmudul Haque
Editors

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Foreword

The global pursuit of sustainability has evolved from a moral imperative to an existential necessity. As the twenty-first century advances, humanity faces an unprecedented convergence of environmental, economic, and social challenges that demand cohesive, intelligent, and inclusive responses. It is within this demanding yet hopeful context that *Green Policies for a Sustainable World* makes its timely and consequential entrance into the academic and policy discourse.

This volume is not merely a collection of research papers. It is a dynamic and intellectually rigorous exploration of how policy, innovation, and governance intersect to shape sustainable futures. The diversity of contributions, both in thematic scope and geographical representation, reflects a shared global urgency. From green infrastructure planning in South Asia to the integration of artificial intelligence in sustainable business models, and from critical minerals policy to climate governance rooted in community leadership, each chapter adds a vital layer to the complex architecture of sustainable development.

What distinguishes this book is its commitment to both depth and breadth. The chapters are empirically grounded yet forward-looking. They are rooted in regional realities yet speak to universal concerns. This balance ensures the book's relevance not only to scholars and students but also to policymakers, practitioners, and institutions engaged in designing and implementing green transitions.

As a scholar engaged in sustainable technologies and systems thinking, I am particularly encouraged by the interdisciplinary methodology and the integration of real-world case studies. These approaches offer not only theoretical insights but also practical tools that can inform meaningful policy reform and institutional innovation.

I extend my sincere appreciation to the editorial team, especially Imran Hossain, whose vision and coordination have brought together a distinguished group of contributors. Their collaborative efforts have resulted in a volume that is both intellectually enriching and globally significant.

May this book serve as a catalyst for deeper reflection, constructive dialogue, and transformative action in the ongoing global effort to build a sustainable, equitable, and resilient world.

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Preface

The accelerating climate crisis, growing socio-economic inequalities, and rapid urbanization have collectively intensified the call for a green transition at local, national, and global levels. In response to this critical need, *Green Policies for a Sustainable World* brings together a wide array of scholarly contributions that explore innovative environmental governance, transformative economic practices, and strategic policy interventions aimed at achieving sustainable development. This volume serves as a timely and comprehensive response to the global demand for integrative, action-oriented research that bridges policy theory with practical implementation across diverse contexts.

This book addresses an urgent gap in our understanding of how green policies can be tailored to varied governance structures, economic conditions, and cultural frameworks across continents. It presents case studies and analytical frameworks from countries such as Bangladesh, Zimbabwe, Uganda, Nigeria, India, Cameroon, Pakistan, and beyond, providing a truly global perspective. These insights are particularly relevant today as governments, civil society, corporations, and academic institutions seek actionable solutions to climate change, environmental degradation, and sustainable economic growth. In this regard, the book appeals to a broad audience, including researchers, environmental policymakers, development practitioners, educators, urban planners, and students engaged in sustainability studies.

The opening chapter by Prerna Srivastava and colleagues introduces a theoretical and practical synthesis of sustainability in corporate environments, highlighting challenges like algorithmic bias, energy consumption in digital operations, and ESG reporting. It provides a roadmap for businesses and regulators to align operations with sustainable development frameworks such as the SDGs and the Paris Agreement. In the following chapter, Martha Mapuranga and her co-authors examine governance models in Zimbabwe and emphasize the critical role of community engagement in the effective implementation of green policies, arguing for a bottom-up approach to climate governance.

The third chapter by Saheed Akinmayowa Lawal and collaborators explores how green policies can reinforce resilience within African health systems, providing

examples from countries like South Africa and Rwanda. It underscores the importance of energy efficiency, green buildings, and policy frameworks based on WHO strategies to address health risks exacerbated by climate change. Similarly, Ransom Tanyu and his colleagues highlight the essential role of public universities in Cameroon in mainstreaming climate change education. Their chapter reveals both the potential and challenges of integrating climate literacy into higher education in developing countries.

In South Asia, Farhana Mustarin and her team delve into Dhaka's urban green space policy, applying GIS and NDVI tools to analyze the distribution and impact of green areas. Their findings stress the urgent need for ecosystem-based adaptation strategies in rapidly urbanizing cities. Kallyani Chakma's chapter on Rajshahi complements this by applying GIS-based multi-criteria analysis to identify priority zones for green infrastructure, offering empirical insights into how urban heat islands can be mitigated through targeted greening interventions.

Plastic waste and the circular economy are addressed by Santanu Ray Chaudhuri, who evaluates how India's hilly, tourism-driven regions can adopt circular economy models to manage plastic sustainably. In a related contribution, Deepshikha Datta and co-authors map waste generation sources and policy trends globally, showing how reverse logistics and bio-economy principles can revolutionize waste management in line with circular economic thinking.

Imran Hossain , Md. Moinuddin Zahangir and A. K. M. Mahmudul Haque offer a compelling study of heatwave adaptation in Rajshahi, Bangladesh, exploring its impact on health, livelihoods, and social cohesion. Their proposed resilience framework is built on an interdisciplinary approach that addresses urban vulnerabilities from multiple dimensions. Similarly, Luke Sewante and his team from Uganda assess the influence of community opinion leaders in promoting climate adaptation through grassroots governance strategies. Their findings advocate for more inclusive and participatory environmental management approaches in urban Africa.

In the field of climate governance, Ayan Chatterjee and co-authors provide an integrated overview of climate mitigation and adaptation policies, combining global agreements with region-specific responses. Their work draws on the IPCC, the IEA, and diverse case studies to highlight the synergy between technology, governance, and grassroots adaptation efforts. The intersection of finance and sustainability is tackled in multiple chapters. Sadia Safdar and colleagues analyze the impact of green financial instruments across income groups, demonstrating how green loans and bonds can catalyze sustainable growth, reduce inequality, and improve energy practices. Shashwata Sahu's doctrinal analysis further explores legal barriers and regulatory innovations in green finance across the Global South, recommending institutional reforms and ESG standardization.

Najeb Masoud presents a comparative study of green finance reforms in Germany and Singapore, using patent data and econometric models to show how financial incentives can stimulate corporate innovation. His research underscores the necessity of context-sensitive policy frameworks. In another vital contribution, Nurcan Kilinc-Ata and Serhat Çamkaya examine the strategic importance of critical minerals for

sustainable energy transitions, offering policy suggestions to secure mineral supply chains while integrating sustainability principles.

Consumer behavior and market transformation are explored through Şehnaz Sakici's meta-analysis, which reveals the moderate yet growing impact of green marketing on eco-friendly consumer choices. Her chapter identifies regional variations and strategic factors that influence green purchasing behavior. Finally, Dr. G. Sunitha and her co-authors evaluate how artificial intelligence is reshaping talent acquisition in recruitment firms. Their findings suggest that AI not only improves operational and financial outcomes but also supports green policy integration and labor sustainability through better compliance and decision-making.

Green Policies for a Sustainable World contributes significantly to the evolving field of environmental governance, offering a multidisciplinary lens through which to understand the interplay between policy innovation, economic transformation, and ecological sustainability. It bridges global aspirations with local realities and provides a diverse yet cohesive narrative that will inform, inspire, and guide stakeholders toward a more sustainable and equitable future. The depth and diversity of the chapters ensure that this volume will remain a valuable resource for scholars, practitioners, and decision-makers navigating the complex pathways of green transformation.

Rajshahi, Bangladesh Imran Hossain

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Conceptual Frameworks and Global Perspectives on Green Policies

Green Policies for a Sustainable Future: Best Practices in Transparent Monitoring and Adaptive Strategies in Management Disciplines

Prerna Srivastava, Udit Mamodiya, Vineet Pandey, and P. K. Dutta

Abstract Business is changing, focusing on sustainability-driven decision-making and aligning to ESG strategies. This paper reviews sustainable supply chain optimization, climate resilience, resource efficiency, and compliance with global mandates like the UN SDGs and the Paris Agreement. Despite progress, sustainability is fragmented across industries, and we need a unified theoretical framework to integrate it. This paper examines sustainability policies, including energy-intensive digital operations, algorithmic bias in environmental governance, and ESG reporting complexities. From Scopus, Web of Science, and IEEE Xplore, it identifies trends, research gaps, and interdisciplinary approaches to bridge the gap between sustainability policies and responsible innovation. Findings contribute to academic research and policymaking and provide a roadmap for corporate leaders and regulators to drive a resilient and environmentally conscious global economy.

Keywords AI · Machine learning · Predictive analytics · Human resource management · Marketing personalization

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1 Introduction

Artificial Intelligence is becoming a key enabler of sustainable business, offering solutions that support environmental, social, and governance (ESG) objectives. AI-driven decision-making frameworks use big data, machine learning, and predictive analytics to optimize energy consumption, reduce carbon footprint, and allocate resources. Companies are harnessing AI solutions for supply chain optimization, intelligent energy management, climate risk assessment and other tools to support global sustainability requirements like the UN SDGs and the Paris Agreement. While AI holds great promise, the use of AI in sustainability-focused business models is piecemeal and, too often, there is no overarching theory to help us systematically evaluate AI's longer-term environmental and social consequences. As AI comes together with sustainable finance, ethical corporate governance, and digital transformation for green innovation, interdisciplinarity is called for to bridge the identified research gaps in implementing sustainable AI. Although artificial intelligence can lead to operational efficiency and strategic agility, its adoption in sustainability programs is industry dependent and poses issues of regulation compliance, ethical AI governance and green policy fusion (Tan, et al., 2024). Renewable power sources, waste management and circular economy logistics are benefitting from AI in predictive analytics, while high carbon footprint industries such as manufacturing and transportation are finding it difficult to adopt AI-driven green initiatives. AI's power-hungry infrastructure and other ethical challenges, the algorithmic bias in environmental policies and the societal implications of a workforce subjected to automation driven transformation are also crucial.

This study aims to bridge these knowledge gaps by systematically reviewing emerging AI trends in sustainable business management, identifying key theoretical contributions and proposing a policy driven AI adoption framework for a sustainable and resilient global economy. While AI is growingly integrated with management practices, that integration is still fragmented by disciplines. Fragmentation requires one unified theoretical framework that should be used in driving its application. Most studies focus on narrow aspects of AI without integration into a body of knowledge. For instance:

- **Marketing**: The role of AI in customer analytics is very well explored, but its strategic implications for brand management are relatively under researched.
- **Human Resources**: AI changes the look of recruitment and performance appraisal of human resources; however, the organization culture has not been worked enough with leadership.
- **Operations**: For example, beyond supply chain optimization, the use of AI in strategic long-range planning is very underleveraged.

This fragmented approach does not allow exploration to the fullest for such a transformative potential of artificial intelligence in the areas of management. What is needed here is an overall body of research conscious of the trend, which enlightens relatively little-explored domains, and provides accurate direction for future studies.

1.1 Objectives

The rapid integration of AI into management disciplines has transformed operational models, decision-making processes, and strategic planning, particularly in the context of sustainable development. However, despite substantial advancements, the existing body of research remains fragmented, often lacking comprehensive theoretical frameworks that link AI adoption directly to sustainability outcomes. This study seeks to consolidate existing knowledge and address these gaps through the following objectives:

1. Summarize the role of AI across management disciplines, highlighting key trends, theoretical advancements, and major contributions from recent literature related to sustainability and responsible innovation.
2. Critically analyze gaps, inconsistencies, and under-researched areas in existing studies, particularly focusing on the absence of unified theoretical frameworks and opportunities for interdisciplinary research development.
3. Propose practical recommendations and formulate relevant research questions to guide future investigations into emerging issues, innovative methodologies, and the integration of AI with sustainable management practices.

Through these objectives, the chapter aims to create a cohesive narrative that supports scholars, practitioners, and policymakers in adopting AI responsibly to foster sustainable and resilient organizational practices.

2 Research Methodology

The present study draws on the framework of systematic literature review that has gained popularity for its structured and reproducible manner of synthesizing earlier research work. Systematic literature review method thus ensures rigorous and unbiased investigation by following a pre-defined protocol that includes explicit criteria of data collection, filtration, and synthesis. Being devoted to the principles of transparency and methodological rigor, systematic literature review reduces bias and enhances the validity of results; therefore, it is widely applied as a method in academic research of any field, even management.

Three established databases were used for the data collection: Scopus, Web of Science, and IEEE Xplore. These websites have a good coverage of peer-reviewed journals and conference proceedings, thereby providing access to high-quality literature. The systematic search strategy was conducted using carefully designed keywords and search strings to capture relevant variations and combinations related to methodologies of reviews in management research. Boolean operators and wildcard characters were also used during the search for comprehensiveness and relevance. Rigorous inclusion and exclusion criteria were employed to refine the selection of the studies obtained. Publications were accepted if they appeared in peer-reviewed journals, concentrated on management applications, and were published

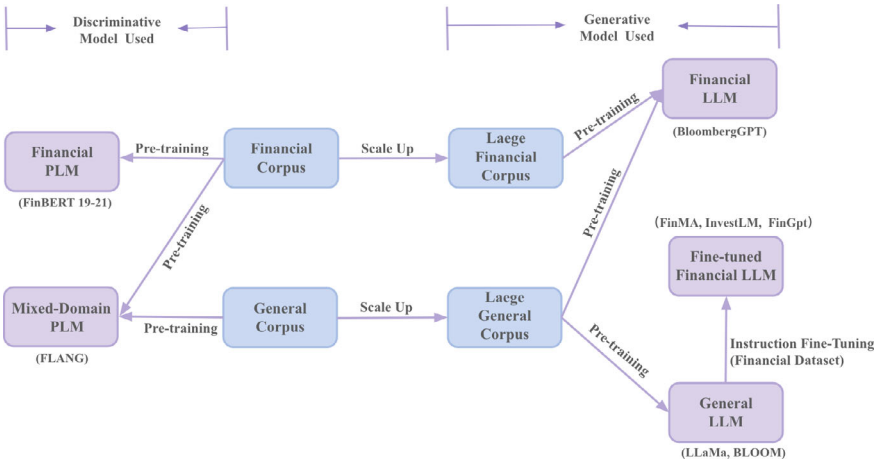

Fig. 1 Growth of research

after 2015, thereby representing the most recent developments in review methodologies. Research that did not pertain to management, sources lacking peer review, and duplicate entries were excluded to preserve focus and reduce redundancy. This meticulous filtering process guaranteed that only high-quality and relevant literature was deemed suitable for analysis. Figure 1 shows the trend in the growth of research in this area showing its importance.

The thematic map illustrates the co-evolution of AI applications across management domains, with early-stage focus areas such as decision support systems transitioning toward integrated frameworks addressing ethical governance and sustainable supply chains. This trend reflects the interdisciplinary maturation of AI studies toward more holistic sustainability outcomes. An analytical framework, thematic coding as shown in Fig. 2 was used to identify patterns, trends, and gaps in literature. Objectives, methodologies, findings, and implications were documented as data that was systematically extracted, which will be further synthesized. Thematic coding allowed recurring concepts to be grouped under a higher-order theme like methodological progress in review methodologies, interdisciplinary strategies, and newly arising challenges. Synthesizing these themes provided a valuable insight into the review methodologies that prevail and the ramifications that it has on management research.

The review process as depicted in Fig. 3 was conducted with the PRISMA guidelines in place, ensuring transparency and replicability. The PRISMA emphasizes the documentation of every step in the review process, from finding studies to final inclusion of the study. A PRISMA flow diagram was used to visually represent the search and screening process as to how literature is systematically filtered and analyzed. This integration of the stringent methods applied ensures integrity and validity in findings and provides a benchmark to conduct a high-quality systematic review in

Table 7 Digital wallet's influence in driving economic growth

"R"	0.934	
"R-squared"	0.873	
"F"	525.933	
"Adjusted R-squared"	0.872	
"P-value (F)"	0.000	
"Durbin-Watson"	1.872	
Coefficients		
Coefficients	B	VIF
(Constant)	0.593	
AI-driven hiring solutions have improved the accuracy and efficiency of candidate screening and selection	0.024	6.093
The implementation of AI in our hiring process has reduced the time required to fill job vacancies	0.003	5.227
AI-powered tools have enhanced the candidate experience by providing timely responses and personalized interactions	−0.090	5.743
The use of AI in hiring has helped minimize unconscious bias in recruitment decisions	−0.021	1.223
AI-driven recruitment solutions have led to cost savings and improved resource allocation in our organization	0.152	2.762
Our organization relies on AI analytics to make data-driven hiring decisions and workforce planning	0.790	24.235

Source Authors gathered and calculated data

(f) All the variables that were chosen had reliability values of 0.986, which is higher than 0.7 and indicates that the collected data is more appropriate and should be chosen for additional analysis.

(g) There was a significant impact of AI technologies in talent acquisition firms and green policies on operational efficiency. This was analyzed using regression, explaining that "The use of AI in recruitment has improved candidate-job matching, leading to better hiring outcomes" has more impact on operational efficiency.

(h) The study used correlation analysis for analyzing the relationship between AI adoption on cost reduction and revenue growth. The results specify that these variables have a strong positive relationship.

(i) Using regression, the study evaluated the impact of AI adoption on different business model aspects, such as revenue streams, cost efficiency, and service innovation. The results explained that "The use of AI in recruitment has improved candidate-job matching, leading to better hiring outcomes." It was having more impact on cost reduction and revenue growth.
(j) There was a significant association between AI adoption and specific risks associated with it, which was evaluated using a chi-square test. The outcomes explain that AI adoption was having a significant association with specific risks. If the adoption of AI increases, specific risks increase.
(k) The study used regression to examine the impact of AI-driven hiring solutions on the financial stability of recruiting companies. The results explain that "Our organization relies on AI analytics to make data-driven hiring decisions and workforce planning" had a greater impact on the financial stability of recruiting firms.

Suggestions

(a) AI adoption will enhance candidates' job matching, reduce hiring time, and increase operational efficiency. It will lower the recruitment costs and increase the revenue, making it a strategic investment.
(b) Companies need to implement robust data protection and compliance measures, as AI adoption increases, the risks associated with it will also increase.
(c) Identifying regular audits on AI tools can optimize hiring outcomes and thereby decrease potential biases in recruitment.
(d) There is a need for training HR managers, HR professionals, and hiring agencies on the adoption and usefulness of AI in recruiting for improving speed and accuracy of talent acquisition and green policies.
(e) Along with AI adoption, human inspection and verification are required for ensuring fairness, diversity, and ethical hiring practices.
(f) There is a need for updating technological advancements to help hire managers to maximize benefits from the technology while mitigating existing risks.
(g) Training is needed for HR professionals by the organizations to effectively use AI-powered recruitment solutions.
(h) There is a need for rechecking the decisions made by AI-generated hiring to ensure progress in business goals and to fulfill diversified objectives.
(i) The HR team can help AI to forecast the hiring needs and optimize workforce strategies for long-term stability.

12 Practical Implications for the Firms

There are several critical implications for recruitment firms looking to integrate AI-powered talent acquisition and green policies solutions into their business models. The data highlights that AI adoption significantly enhances operational efficiency by improving candidate-job matching, reducing hiring time, and increasing revenue,

making it a strategic investment for firms. However, as AI adoption grows, firms must address the associated risks, such as data privacy concerns and algorithmic bias, by implementing robust data protection measures and conducting regular audits of AI tools. Moreover, to maximize the benefits of AI, HR professionals and recruitment agencies need comprehensive training in AI technologies and their ethical use in recruitment, ensuring fairness, diversity, and accuracy in hiring decisions. Furthermore, while AI can drive efficiency and cost reductions, human inspection and verification remain necessary to align AI outcomes with the firm's long-term goals and ensure ethical practices. By continuously updating technological tools and ensuring alignment between AI-driven strategies and organizational objectives, recruitment firms can leverage AI not just for short-term gains but for sustained business stability and growth.

13 Scope for Future Research

(a) There is a need for further study on AI in reducing bias in hiring.
(b) Furthermore, AI's impact on employee retention and long-term workforce planning needs to be analyzed.
(c) There can be a comparative analysis of AI adoption between small, medium, and large recruitment companies.

14 Conclusion

The study emphasizes how artificial intelligence is increasingly being acknowledged as a significant component of hiring procedures. AI, a practical and effective substitute for conventional hiring practices, has enhanced businesses overall and led to a change in hiring procedures. The current study looked at how hiring firms' business models and financial stability are affected by AI-powered talent acquisition and green policies.

The outcomes explain how the use of AI has radically distorted the recruitment companies with the enhancement of operational efficiency, by reducing the hiring costs and improving the growth in revenue. When compared with the traditional process of recruitment, there was a drastic change with the adoption of AI-driven hiring tools in scalability and profitability. For better hiring results, there is a need for AI-powered recruitment for decision-making in the selection of candidates, resulting in better hiring outcomes. There are issues found with the implementation of AI, like algorithmic bias, compliance risks, and the need for workforce reskilling; these must be addressed for a sustainable adoption of AI.

Strategic frameworks are to be implemented to reduce the risks in adopting and optimizing AI capabilities. For long-term success, firms must ensure ethical AI use, constantly observe AI-driven hiring processes, and identify and invest in

employee upskilling. AI-driven talent acquisition and green policies are restructuring recruitment strategies to overcome the challenges and risks associated with them.

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