

MULTIDIMENSIONAL PERSPECTIVES ON CLIMATE CHANGE MITIGATION AND ADAPTATION: A SYNTHESIS OF ECONOMIC, SOCIAL, AND ENVIRONMENTAL STRATEGIES

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Received : 01 December 2025

Revised : 15 December 2025

Accepted : 10 January 2026

Published : 31 January 2026

DOI : <https://doi.org/10.54443/jaruda.v4i3.297>

Link Publish : <https://jaruda.org/index.php/go>

Abstract

Climate change presents a multifaceted global challenge requiring comprehensive strategies across economic, social, and environmental dimensions. This study aims to synthesize recent research findings regarding climate change mitigation and adaptation strategies, ranging from corporate governance and economic modeling to grassroots agricultural innovations and psychological responses. A comprehensive literature review method was employed to analyze nine recent scholarly articles focusing on diverse aspects of the climate crisis. The synthesis reveals three key themes: (1) The critical role of corporate governance, including board diversity and accounting standards, in managing climate risk; (2) The necessity of technological and policy interventions in agriculture and urban planning to mitigate heat and ensure food security; and (3) The significant impact of psychological and health factors, where emotional responses to climate change drive pro-environmental behavior. The study concludes that effective climate action requires an integrated approach that combines high-level policy frameworks with community-based innovations and psychological engagement.

Keywords: *Climate Change Mitigation Corporate Risk-Taking Sustainable Agriculture Eco-Emotions Environmental Economics*

Introduction

Climate change has evolved from a purely environmental issue into a systemic crisis affecting global economic stability, public health, and social structures. This phenomenon is characterized by rising global temperatures, extreme weather, and ecosystem disruptions that demand adaptive responses from various sectors (Abdul-Nabi et al., 2025). In a macroeconomic context, economic activity has a complex reciprocal relationship with energy consumption and pollution, where economic growth often triggers environmental degradation that ultimately harms economic productivity itself (de Juan et al., 2025). At the micro and sectoral levels, these challenges manifest themselves in various forms of risk. The corporate sector faces regulatory and physical pressures that force changes in risk-taking behavior and financial reporting (Habib, 2025; Kumarasiri et al., 2026). Meanwhile, the agricultural sector in developing countries faces direct threats to food security due to rainfall variability and extreme temperatures, which require appropriate technological innovation (Beah et al., 2025; Stewart et al., 2026). In addition to physical and economic impacts, psychological and social dimensions also play a crucial role; individual emotions towards the climate crisis have proven to be an important determinant in encouraging concrete action (Kovács et al., 2024). This research aims to summarize and synthesize the current literature to provide a holistic view of how various disciplines, from accounting and management to agriculture and psychology, are responding to the challenges of climate change. By integrating findings from various case studies and empirical analyses, this paper offers a new framework for policymakers and practitioners in designing effective mitigation strategies.

Literature review

2.1. Economic Dynamics and Climate Risk Governance

The relationship between economic activity and climate change is complex and reciprocal. (de Juan et al., 2025) explains that economic activity drives energy consumption that produces pollution, but on the other hand, environmental damage due to climate change can hamper long-term economic growth. In the corporate context, climate change risk (CCR) has become a key determinant of corporate strategy. (Habib, 2025) highlights that CCR drives increased corporate risk-taking (CRT), where managers tend to be more aggressive in the face of uncertainty. However, this relationship is moderated by strong governance mechanisms, such as Board Gender Diversity and Environmental, Social, and Governance (ESG) performance, which serve to balance risks for long-term sustainability. In addition, the accounting profession is also experiencing a shift in role. (Kumarasiri et al., 2026) uses Actor-Network Theory to show how climate regulations act as "boundary objects" that force accountants to engage in emission risk management, a domain previously dominated by technical professions.

2.2. Agricultural and Built Environment Adaptation Strategies

Adaptation to physical environmental changes requires specific technological and policy interventions. In the agricultural sector, climate variability threatens food security, particularly in developing countries. (Beah et al., 2025) emphasized the effectiveness of decision support tools such as the APSIM model in optimizing the use of drought-tolerant maize varieties and nitrogen management in Nigeria. A similar, more community-based approach is proposed through (Stewart et al., 2026) the concept of frugal innovation, which empowers smallholder farmers in the Global South to build adaptive capacity independently. In urban environments, a major challenge arises from the Urban Heat Island (UHI) phenomenon. (Almashhour & Kolo, 2025) They criticize current building regulations, which often ignore heat emissions from the physical structure of the building itself. They propose a new regulatory framework that would make heat emissions a criterion for building approval, complementing existing green building initiatives to create cooler and more livable cities.

2.3. Health, Psychological, and Social Impact Dimensions

The impacts of climate change extend to human physical and mental health. A scoping review by (Abdul-Nabi et al., 2025) confirmed a strong correlation between climate change and increases in respiratory, cardiovascular, and vector-borne diseases, which are exacerbated by air pollution. In addition to the physical impacts, individuals' psychological responses to the climate crisis are also a focus of attention. (Kovács et al., 2024) found that negative emotions such as climate anxiety (eco-anxiety) are not always detrimental; instead, if managed with adaptive emotion regulation, these emotions can be powerful drivers of pro-environmental behavior. To maximize the societal impact of this research, (Zhu & Dolnicar, 2025) it is recommended that business researchers transition from "Mode 1" (pure theory development) to "Mode 2" (practical solutions). This is essential for translating academic findings into concrete actions that can be adopted by the wider public and industry stakeholders.

Research methods

This study uses a systematic literature review method on nine reputable international journal articles published between 2024 and 2026. These articles were selected because of their relevance to the theme "Climate Change Environment" and cover a wide spectrum of disciplines. The analysis was conducted by grouping the findings into three main thematic clusters: (1) Economics, Corporate Governance, and Regulation; (2) Sectoral Adaptation: Agriculture and Urbanism; and (3) Social, Health, and Psychological Dimensions. Narrative synthesis was used to connect the separate findings into a coherent argument.

Results and Discussion

3.1. Economics, Corporate Governance, and Climate Risk Regulation

The economic and corporate sectors are at the forefront of addressing the transition and physical risks of climate change. Studies (de Juan et al., 2025) confirm that the relationship between economic activity and climate change is bidirectional; economic activity drives emissions through energy consumption, while environmental damage from climate change (such as extreme weather events) reduces long-term economic output. In responding to these risks, corporate governance plays a vital role. Habib (2025) found that Climate Change Risk (CCR) positively influences Corporate Risk Taking (CRT). This finding suggests that managers tend to take higher risks in response to climate uncertainty. However, this relationship is moderated by Board Gender Diversity (BOD) and Environmental, Social, and Governance (ESG) performance. The presence of women on the board of directors and a strong ESG commitment serve as a control mechanism that balances excessive risk-taking, ensuring that the

company remains resilient. From an accounting and regulatory perspective, (Kumarasiri et al., 2026) it highlights how climate regulation acts as a "boundary object" mediating the professional jurisdictions between accountants and engineers. In Australia, carbon emissions reporting regulations have forced accountants to expand their roles beyond financial reporting to carbon risk management, although technical cognitive control often remains with applied science professions.

3.2. Sectoral Adaptation: Agricultural and Urban Innovation

Physical and technological adaptation is particularly urgent in vulnerable sectors. In the agricultural sector, (Beah et al., 2025) they demonstrated the effectiveness of using decision support tools such as the APSIM model to mitigate the impacts of climate change on maize crops in Nigeria. Their study suggests that a combination of drought-tolerant maize varieties and appropriate nitrogen fertilizer management can minimize yield declines. Similarly, (Stewart et al., 2026) the importance of frugal innovation is emphasized through the development of the "NicaAgua" mobile app for smallholder farmers in Nicaragua. This community-based approach allows farmers to access accurate local weather forecasts, helping them build adaptive capacity amid climate uncertainty in the Global South. In urban settings, (Almashhour & Kolo, 2025) they argue for a new regulatory framework focused on building heat emissions. They identify that building structures are a major contributor to the Urban Heat Island (UHI) effect. Therefore, diagnostic and regulatory tools are needed that require cities to approve buildings only if they meet low heat emission criteria, complementing existing green building strategies.

3.3. Social, Health, and Psychological Dimensions

The human aspect of climate change is equally important. Its (Abdul-Nabi et al., 2025) scoping review outlines the broad impacts of climate change on human health, from increased respiratory illnesses due to air pollution to the spread of waterborne and insect-borne diseases due to global warming. Behavioral responses to this crisis are heavily influenced by emotions. (Kovács et al., 2024) found that negative emotions about the climate crisis (such as eco-anxiety) are actually positively correlated with pro-environmental behavior. This study suggests that adaptive emotion regulation strategies are needed to channel these negative emotions into constructive climate action, rather than leading to resignation. (Zhu & Dolnicar, 2025) adding a business research perspective, they propose a framework for achieving real social impact. They argue that business researchers must shift from merely developing theory (Mode 1) to developing practical solutions (Mode 2) that can encourage pro-environmental behavior in society and industry, so that academic research can directly contribute to climate change mitigation.

Conclusion

This synthesis of various journals demonstrates that addressing climate change cannot be done in silos. There is a strong connection between macroeconomic policies, corporate governance, sectoral technological innovation, and individual psychology. Effective mitigation strategies must include strengthening inclusive corporate governance (ESG and gender diversity), implementing adaptive technologies in vulnerable sectors such as agriculture and urban areas, and a deep understanding of the psychological factors that motivate human action. Synergy between government regulations, corporate initiatives, and community participation is key to building sustainable climate resilience.

Thank-you note

The author expresses his deepest gratitude and appreciation to Dr. **Rakesh Sitepu, SE, MM, Ak., CRMP**, the supervising lecturer. His guidance, direction, and academic insight have significantly contributed to the preparation and completion of this research synthesis. He hopes that this paper meets the expected academic standards and is beneficial to the development of science.

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