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CLIMATE CHANGE RISK AND CORPORATE RESILIENCE: THE ROLE OF SUSTAINABILITY STRATEGIES

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Abstract

The impacts of climate change are making corporate resilience a key strategic capability, given the growing risks that firms are facing, stemming from both physical and non-physical factors. Climate change is increasingly exposing firms to physical, regulatory, and operational risks, as well as market risks, and corporate resilience is becoming a key strategic capability. In this study, climate change risk's impact on corporate resilience is explored, and sustainability strategies are considered as a mediator between the two. Based on dynamic capability theory and the natural resource-based view, the study posits that companies with higher climate risks are more likely to engage in sustainability practices and that this would enhance their ability to predict, absorb, adapt, and rebound from environmental shocks. The present study adopts a quantitative, cross-sectional study with data gathered from a structured questionnaire filled out by managers and decision-makers from industries that are sensitive to climate change. Climate risk, sustainability measures, and corporate resiliency are assessed with well-validated multi-item scales. The proposed relationships are tested by Partial Least Squares – Structural Equation Modeling (PLS-SEM), which can be used to test the measurement model, direct effects, and mediation effects simultaneously. The study shows that climate change risk is an

important driver of corporate resilience and that sustainability strategies have an important mediating role, as they increase the companies' preparedness, resource efficiency, adaptability, and strategic flexibility. The study brings together three fields of inquiry, namely “climate risk”, “sustainability strategy” and “corporate resilience” in one empirical context, which is a novelty compared to the other streams of literature. It also provides implications for managers, policymakers, and investors, identifying sustainability as an important inclusion in corporate strategy to help organizations decrease their susceptibility to climate change and improve their resilience over time.

Introduction

In response to climate change, the need of today's organizations is to find themselves in a position of major strategic challenge. Its effects are no longer confined to environmental issues and are manifesting in increased impact on corporate decision-making, operational continuity, investment strategies, and competitive advantage. Increased temperatures, flooding, droughts, storms, shortages of resources, and other extreme weather events can disrupt production systems, supply chains, infrastructure, and access to critical resources. Governments, investors, customers, and stakeholders are also driving more pressure on organisations to cut carbon emissions, enhance environmental performance, and contribute towards a low-carbon economy (Florez-Jimenez et al., 2025) . Hence, climate change is a multi-faceted business risk, with physical impacts, regulatory, technological, market and reputational concerns.

Climate risks are typically broken down into physical risks and transition risks. Physical risks are those that are directly linked to climate change impacts, including floods, heat waves, hurricanes, rising temperatures, water shortages, and climate change over the long term. The risks can hurt organizational assets, add to the expenses of the business, disrupt supply chains, and decrease productivity. Transition risks are, however, associated with the transition towards a sustainable business model, such as new regulations, carbon pricing, technological advances, shifting customer expectations, and investor demands (Lv & Sarker, 2024). For organizations not adequately prepared for these changes, there may be greater operational and strategic vulnerabilities.

Increasing uncertainty around climate change has put corporate resilience on the agenda. As climate change becomes more unpredictable, corporate resilience becomes more relevant (Ciasullo et al., 2024) . Corporate resilience is the capacity of the entity to survive and endure shocks, adjust to shocks and changes, and bounce back to produce value. From a climate change perspective, resilience means creating strategic agility, organizational skills, and adaptation processes to effectively navigate environmental uncertainty. Resilient organizations don't just react to crises; they have the ability to anticipate threats, adapt, and seize opportunities as they arise.

Traditional risk management strategies primarily concentrate on minimizing losses and mitigating the immediate risks. But with climate change, a more comprehensive approach to strategy that enhances longer-term adaptability is needed. As a result, sustainability strategies are becoming more and more relevant as organizations incorporate environmental and social aspects into their decisions, processes, products, procurement, and planning (Bashir et al., 2025). Such strategies range from investing in renewable energy to boosting energy efficiency, reducing waste, implementing sustainable sourcing, adopting circular economy principles, fostering green innovations, and assessing environmental risks. Studies show that sustainability policies can yield increased efficiency, innovation, better reputation, and stakeholder relations, all of which increase the performance of the organization.

Studies have revealed that sustainability policies can have a positive impact on organizational performance that can be seen in increased efficiency, innovation, reputation, and stakeholder relations. Yet there remains a need to investigate further their role in developing corporate resilience. Sustainability practices can assist organisations in decreasing reliance on fragile resources, enhancing supply-chain flexibility, managing environmental risk and building the ability to develop technologies that adapts to changing market and regulatory environments (Mohamed et al., 2025). It is important to not only consider sustainability as an environmental duty, but also as a strategic competency that enables organizational survival and competitiveness.

How organizations respond to climate-related issues varies greatly. Others take a reactive strategy, making only minimal changes when they are mandated by laws or when something happens. Others view climate risk as a strategic priority and consider sustainability a long-term strategy for their business (Florez-Jimenez et al., 2025). These groups invest in cleaner technologies, restructure supply chains, increase resource efficiency, and create sustainable products, which can make them more resilient to climate disruption. Dynamic capability can be used to explain the linkage between climate change risk, sustainability strategy, and corporate resilience.

Dynamic capabilities include the capacity to detect changes in the environment, to take advantage of opportunities when they arise, and to adjust resources and processes to deal with uncertainty. Climate change can be a dangerous environment for organizations to operate in, constantly evaluating risk, creating solutions, and adapting strategy. Promoting innovation, learning, environmental awareness, and resource transformation can enhance these capabilities through sustainability efforts.

The natural resource-based view also reinforces the significance of sustainability as a strategic competence. The view here is that environmental capacities like pollution prevention, sustainable development, and responsible resource management can generate competitive advantages, that is, benefit by avoiding environmental constraints. Thus, sustainability strategies can play a dual role in an organization's sustainability and environmental performance (Lv & Sarker, 2024). Though data on climate change and sustainability is growing, there are still significant gaps. Previous studies have been mostly concentrated on the financial performance, reputation, innovation, or competitive advantage impacts of environmental practices.

Fewer studies have explored the role that sustainability initiatives can play in enhancing organizational resilience in threats of uncertainty arising from climate change. Likewise, for climate risk research, a focus is placed on financial exposure, emissions, and compliance instead of organizational capacity for adaptation. This connection between climate risk, sustainability strategies, and resilience needs to be further explored.

This study fills these gaps by exploring the impact of sustainability measures on the relationship between climate change risk and corporate resilience. It suggests that climate change challenges spur organizations to take actions aimed at sustainability, and that these actions help them adapt, recover, and sustain their long-term performance. The study aims at three objectives, which include understanding the impact of climate change risk on corporate resilience, investigating the role of sustainability strategies in resilience, and identifying sustainability strategies as a link between climate change risk and corporate adaptation (Fu et al., 2023).

Managers, investors, and policymakers will all be interested in the study's implications. It reminds managers that sustainability needs to be part of their strategic planning process and not a compliance exercise. Sustainability investments may enhance organisations' readiness, innovation, and adaptive capacity (Priya et al., 2025). Investors and policymakers can benefit from a sustainable and resilient strategy by learning how sustainability and resilience work together, as this can help to identify long-term risks and lead to policies that foster sustainable business and climate adaptation.

Climate change is reshaping the business landscape in the areas of competition, investment and risk management. Businesses that embed sustainability initiatives into their strategic thinking could be more likely to cope with uncertainty, manage resources and sustain performance (Bashir et al., 2025). In this study, the authors provide additional evidence on how sustainability can be used as a strategic tool to create corporate resilience in a climate-sensitive business landscape.

Literature Review

Climate Change Risk and the Corporate Environment

The uncertainty caused by climate change has become a big challenge for organizations in their strategic and operational planning. It not only affects the environment but also increasingly has an impact on business performance, investment decisions, supply chains, production systems, resource availability, and business competitiveness. Organizational-level climate change risk is defined as the potential adverse impacts of climate change-related developments on resources, operations, financial results, and strategic goals (Zulqarnain & Hasan, 2024). There are generally physical risks and transition risks.

Physical climate risks are those that are caused by direct shifts in climatic conditions, such as floods, storms, wildfire, heat waves, increasing temperature, water scarcity, and variations in precipitation (Allan & Nahm, 2025). These events can affect the organization's assets, logistics and transportation systems, employee productivity, access to raw materials, and result in instability of the supply chain. Climate-sensitive organisations that rely on resources or operate in specific geographic areas may be more vulnerable to these risks (Lv & Sarker, 2024).

The risks of transition are linked to economic, regulatory, technological and social changes related to the transition to a low-carbon economy. Regulations, carbon reduction mandates, climate reporting guidelines,

technological advancements and evolving investor and consumer demand can have a major impact on the competitiveness of organizations. Companies that don't prepare for these changes could be subject to higher expenses, reputational risks, fewer market opportunities and investment restrictions (Shafizadeh, 2024).

Climate change risk is therefore an environmental challenge and a strategic business problem that includes technology planning, resource planning, supply chain planning, innovation planning, and investment planning. Climate pressures can require organizations to rethink their business processes, find ways to become more efficient with their inputs, expand their supply chains, and build environmental risk management (Zhang & Bao, 2025). But the ability to respond effectively varies among firms, highlighting the importance of organizational capabilities in shaping the vulnerability or potential for adaptation to climate risks.

Corporate Resilience

In today's fast-changing and uncertain environments, corporate resilience is a growing consideration. It is a measure of the capacity of firms to forecast disruption, withstand shocks, sustain critical operations, adjust to events, and recover from negative occurrences. Previous conceptualizations of resilience were largely focused on the ability to bounce back from disruption (Gupta & Gupta, 2025). But current studies suggest the capacity for resilience is a more comprehensive ability to adapt, learn, bend, change, and renew an organization. Resilient companies do not just rebound, they are able to leverage disruption to make the process better, realign resources, and augment their capabilities.

This is especially important for climate change as climate-induced events are frequently recurring, interlinked, and long-term. One weather event can impact multiple areas of infrastructure, employee health and safety, supplier availability, energy resources, logistics, and customer demand (Ahsan & Khawaja, 2024). Likewise, industries can gradually change due to regulatory change, technological advancement, and shifting market expectations. The resilience of companies facing climate uncertainty thus depends on having a response capacity as well as on adaptation to the long term. Moreover, Zhang & Bao (2025) stated that operational flexibility, continuity planning, organizational learning, technological investment, and restructuring resources based on the changing environmental conditions are all required by firms. More recent studies tend to consider resilience as an adaptive organisational capacity contributing to sustainability and long-term performance.

Sustainability Strategies

Sustainability has become an integral part of corporate management and a concept that is no longer about compliance. Sustainability strategies are policies and practices of organizations that incorporate environmental, economic and social issues into decisions and long-term planning. Sustainability measures encompass energy efficiency, reducing greenhouse gas emissions, utilizing renewable energy, waste minimisation, circular economy principles, sustainable supply chains and environmental innovation

investments in the context of climate change (Khan, 2025). In addition, organizations can adopt environmental management systems and climate-risk assessments to enhance their capacity to manage in an environment with variable conditions.

Sustainability strategies need to be part of the business's core activities to be effective. Actions aimed at the environment undertaken outside strategic planning can yield short-term gains. But sustainability practices that are woven into the way an organization leads, invests, purchases, runs, and innovates can develop valuable organizational capabilities. Sustainability strategies can also be used to increase resilience by decreasing reliance on vulnerable resources (Hossain, 2026). Energy efficiency can limit exposure to energy uncertainty, renewable energy can help increase resource security, and sustainable sourcing can help minimize supply-chain vulnerability. Innovation, resource management, and environmental awareness can bolster the capacity of companies to adapt to unexpected changes in the environment through sustainability strategies.

Climate Change Risk and Corporate Resilience

Exposure to environmental uncertainty has the potential to have a significant impact on corporate resilience, as it can impact how companies are preparing for and reacting to disruption. Physical risks can motivate companies to build up infrastructure, BCP, and supply chain. Transition risks could spur companies to reevaluate technologies, investments, products, and positioning (Guihenneuc et al., 2024). But the link between climate risk and climate resilience is complicated. High exposure to climate change can lead to heightened vulnerability in the absence of resources and adaptive capacity of the organizations.

Operational stability and financial performance can be adversely impacted by extreme weather events, resource constraints and regulatory forces. Meanwhile, a greater understanding of climate risks can spur organizations to build up their adaptation measures. Companies that are aware of environmental risks could invest in risk analysis, innovations, diversification of suppliers, and strategic planning (Florez-Jimenez et al., 2025). Climate change risk can then act as a catalyst for disruption or as a catalyst for improving the organization. This correlation, then, leads to the following hypothesis.

H1: Climate Change Risk has a significant impact on Corporate Resilience.

Climate Change Risk and Sustainability Strategies

The intersection of climate change risk and sustainability strategies is a subject that has not received much attention. The pressure of climate change can be a driver for organisations to implement sustainability measures (Eleftheriadis & Anagnostopoulou, 2017). Companies experiencing transition risks or physical risks could see gaps in current business models and may seek out sustainable solutions to minimize the risk. For instance, organizations with water shortages can invest in water-conserving technologies, and those with energy uncertainty can invest in renewable energy technologies.

The risk of climate change may then be a driver towards better resource efficiency, better environmental management within the company, emission reductions, and meeting regulatory and stakeholder requirements. Sustainability plans shift in focus – from environmental measures to a strategic response to future uncertainty (Al frijat et al., 2025). The reactions of organisations vary, but those with greater strategic awareness and adaptability are more likely to take proactive sustainability measures. This means that there will be higher uptake of sustainability strategies in the face of greater uncertainty. The impact of climate change risk on sustainability strategies is very positive. This study helped generate the second hypothesis.
H2: Climate change risk has a significant positive effect on sustainability strategies.

Mediating Role of Sustainability

Strategies for climate change risk may directly impact corporate resilience; sustainability strategies offer an important pathway for helping firms translate climate awareness into adaptive capacity. Businesses that invest in sustainable technologies, resource efficiency, diversifying their supply chains, and climate-risk management may be more resilient to and responsive to environmental disturbances. Sustainability strategies can enhance resilience in a number of ways (Kareem et al., 2025). Sustainability strategies are therefore an organizational "pathway" by which climate risks can be translated into more robust adaptive capacity. Therefore: The relationship between climate change risk and corporate resilience is significantly mediated by sustainability strategies (Kalogiannidis et al., 2024). Therefore, this led the study to the third hypothesis.
H3: Sustainability strategies significantly mediate the relationship between climate change risk and corporate resilience.

Dynamic Capabilities Theory

The theoretical underpinning of this study is based on Dynamic Capabilities Theory. The theory describes an organization's reaction to the changes in its environment by increasing the capability of sensing the changes, exploiting opportunities, and reconfiguring resources and capabilities. Climate change is a dynamic environment and a process that needs continuous adaptation. It is important for organisations to recognize climate threats, such as physical hazards, regulatory change, resource constraints and stakeholder expectations (Idris, 2024). They need to then take appropriate action using sustainability measures such as the use of renewable energy, clean technologies, sustainable supply chains and environmental management systems. Finally, companies need to change their resources, processes, and practices in order to become resilient. Thus, Dynamic Capabilities Theory can be used to understand the impact of climate risks on sustaining actions, and how those actions in turn enhance corporate resilience (Azam et al., 2026).
While the study of climate change, sustainability, and resilience has grown, there are still some gaps. First, current literature tends to concentrate on the financial implications, emissions, disclosure, and

environmental performance of climate risk, but not on the role of climate risk in contributing to resilience development. Second, the concepts of sustainability and resilience have been studied separately, with few studies analyzing sustainability strategies as tools to build resilience in the face of climate uncertainty. Third, the number of empirical studies examining the mediating effect of sustainability strategies between climate change risk and corporate resilience is limited (Dai et al., 2025). The mechanism is important to understand because it is not climate exposure that is the key to better adaptation among different organizations—rather, it is the organizational capacity to do so. This study aims to bridge these gaps by creating an integrated framework that looks at the direct connection between climate change risk and corporate resilience as well as the indirect impact of sustainability strategies. The study uses Dynamic Capabilities Theory to elucidate how firms can harness climate-related opportunities as strategic capabilities to enhance long-term firm resilience (Zhang & Bao, 2025).

Theoretical and Conceptual Framework

This study is mainly based on Dynamic Capabilities Theory, which is a theory used to explain how the organization adapts to the changing and uncertain external environment. Dynamic capabilities are the potential of a company to recognize potential threats and opportunities, devise solutions, and adjust organizational assets and routines to stay competitive. Climate change is a challenging business landscape in which dynamic capabilities are crucial (Priya et al., 2025). There are more and more physical risks to which organizations are exposed, such as climate change, resource depletion, and supply chain disruptions, and transition risks linked to environmental laws, technological shifts, and expectations of other stakeholders. In these conditions, companies are no longer able to use their own resources and procedures, but have to keep enhancing their strategies and capacities continuously.

Organizational adaptation is described by Dynamic Capabilities Theory in terms of three processes: sensing, seizing, and transforming. The sensing process is the one that recognizes change in the outside environment. For companies, the challenge in this study is to identify the risk factors of climate change, including extreme climate, regulatory requirements, resource constraints, and market shifts. An organization that successfully identifies these risks will more successfully become aware of the need for strategic adaptation (Allan & Nahm, 2025). The seizing process involves planning and taking suitable responses. Sustainability strategies are a crucial response mechanism that companies can use to tackle climate-related challenges. Implementing renewable energy, resource efficiency, emission reduction, sustainable supply chains, and environmental management systems are strategies that can be implemented.

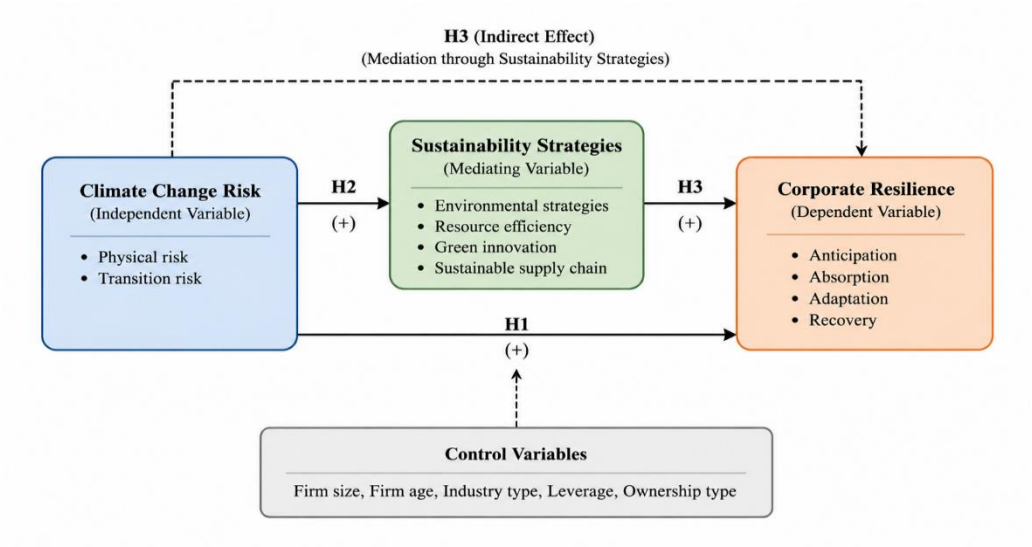


Figure 1: Conceptual Framework of Hypothesis.

The transforming process has to do with reorganizing organizational resources, routines, and capabilities. Implementing sustainability measures can involve companies making changes to their working practices, supply chains, and decision-making processes, as well as investing in new processes, technologies, and practices. These transformations enable organizations to enhance their environmental uncertainty management capabilities. Hence, Dynamic Capabilities Theory is used to explain the proposed relationships. Climate change risk is an external force that an organization must detect; sustainability strategies are strategic actions, and corporate resilience is the consequence of successful adaptation (Kalogiannidis et al., 2024). Main Constructs are conceptualized. The conceptual framework is based on three major constructs, namely, climate change risk, sustainability strategies, and corporate resilience.

Sustainability strategies are the intermediary between both these drivers. They describe organizational practices that make environmental issues part of the business and business planning over the longer term. These encompass energy efficiency, renewable energy, emission reductions, waste management, sustainable sourcing, circular economy, environmental innovation, and climate-risk assessment (Shafizadeh, 2024). This study treats sustainability strategies not as a responsibility, but as strategic ability. Companies that embrace sustainability can minimize reliance on resources, boost efficiency, anticipate and adapt to policy shifts, and enhance adaptive capacity.

Resilient organizations are flexible, prepared, learning, and resource-reconfiguring when conditions outside change. When it comes to addressing climate change, resilience means being able to keep running during a disruption, adapting to supply chains, reacting to regulation changes, and investing in technology that lowers vulnerability.

Hypothesized Relationships

The project focuses on the risk related to climate change, as well as corporate resilience. Climate change risk could have both negative and positive effects on businesses' resilience. Physical and transition risks can increase vulnerability by disrupting operations, increasing costs, and creating uncertainty (Ciasullo et al., 2024). But this knowledge can also encourage organizations to enhance their risk management, increase their preparedness, resource diversification, and adaptive capabilities. Based on this, it is suggested that the study should include: The impact of climate change risk on corporate resilience is significant.

The climate-related pressures could incentivize organisations to implement more robust sustainability approaches. Companies in environments with uncertainty could invest in sustainable supply chains, cleaner technologies, resource efficiency, emission reduction, and renewable energy. Climate risk therefore has the potential to be a catalyst for transformation to sustainability (Florez-Jimenez et al., 2025). Climate change risk has a strong positive influence on sustainability strategies.

This study's main argument is that sustainability strategies explain the relation between climate change risk and corporate resilience. Exposure to climate does not necessarily lead to resilience; it is achieved through strategic responses. Sustainability strategies build resilience by making them less reliant on fragile resources, more flexible with their supply chains, more innovative, and better prepared in their organizations. These mechanisms also enable companies to turn climate-related challenges into opportunities for adaptation and future value creation. In this way, the relationship between climate change risk and corporate resilience is significantly mediated by sustainability strategies. Climate-related pressures are proposed to have direct and indirect effects on organizational resilience via sustainability strategies. The theory of Dynamic Capabilities is used to elucidate that resilient organisations are the ones that can perceive climate change-related threats and undergo the necessary changes to adapt to sustainability challenges, as well as to redefine their resources for long-term adaptability.

Methodology

The research method used in this study is quantitative, explanatory, and cross-sectional in order to investigate the relationship between climate change risk, sustainability strategies, and corporate resilience. A quantitative approach is deemed appropriate for the study since it sought to test theoretically derived relationships between well-defined constructs in an empirical fashion as well as examine direct and indirect effects within the conceptual framework.

The study's explanatory approach focused on understanding the relationship between climate change risk and corporate resilience and how sustainability strategies played a role in this relationship. In particular, the study examined whether climate change risk directly affected corporate resilience, whether climate change risk affected the implementation of sustainability strategies, and if the sustainability strategies acted as a mediating variable in the transformation of climate change challenges to corporate resilience.

The cross-sectional survey design is used due to the collection of data from organizational respondents in one time period. This method is appropriate for the purpose of analysing managers' perceptions of climate-related risks, sustainability practices, and the abilities of the firms in a number of companies (Tajik et al., 2024). This study is aimed at understanding the relationships between constructs at the organisational level, not individual attitudes or behaviours.

The organizational level is the unit of analysis, and managers or organizational decision-makers were the respondents. Respondents were chosen from roles that held relevant knowledge of organizational activities and decision-making processes, as the study explored the strategic aspects related to sustainability practices, climate risk management and resilience capabilities. These were senior managers, sustainability managers, environmental managers, operations managers, supply-chain managers, strategy managers, and other executives tasked with the organisation's planning.

The selected industries included in the target population were those that are considered climate physical and transition risks. These industries encompassed manufacturing, energy, construction, transportation and logistics, agriculture, textiles, chemicals, and other resource-intensive industries. These sectors were selected because their activities are directly affected by climate change and include organizations whose resources, activities, supply chains, and strategic decisions are directly affected by climate change.

Purposive sampling is used because the study needed respondents who have knowledge and experience in climate risks, sustainability efforts, and organizational resilience. If the respondents had been selected randomly from all of the employees, there might have been unreliable answers, as there may be a large group of employees without the necessary knowledge on strategic environmental practices. For this reason, the respondents were targeted who have managerial and organizational knowledge.

The study received 177 valid responses, which is considered to be appropriate for the analysis of the proposed structural model using PLS-SEM. Increased sample size provided additional statistical power, increased reliability of estimates, and increased power to explore complex relationships such as mediation relationships.

A structured questionnaire was used to gather primary data. The questionnaire was sent out via e-mail to professional networks, contacts of organizations, and online survey platforms. Where possible, direct distribution to managers was also employed to enhance the quality of the response. The participants were given information about the purpose of the study and that the responses would not be shared with anyone other than the researchers and would only be used for academic research. Participation was voluntary.

A small-scale test was done prior to the large-scale testing. In the pilot study, around 25 respondents were reached with adequate knowledge about the strategy and sustainability practices of the organizations. This stage was to look for unclear wording, ambiguous questions, and difficulties in filling out the questionnaire.

The pilot study gave the researchers feedback to enhance the research instrument without altering the theoretical meaning of the constructs.

All key variables were assessed by means of multi-item scales developed based on earlier research on climate change risk, sustainability management, and organizational resilience. This was measured on a five-point Likert scale from 1 = Strongly Disagree to 5 = Strongly Agree. This scale enabled people to express their level of agreement with items concerning the practices and capabilities of organizations.

The questionnaire comprised parts related to the organizational attributes as well as the three major research constructs: climate change risk, sustainability strategies, and corporate resilience. Climate change risk was the independent variable and was based on how much organizations were exposed to threats related to climate change. Physical risk and transition risks were included in the construct.

Physical risk factors included exposure to extreme weather, damage to infrastructure, lack of resources, and disruption to supply chains. The transition risk indicators were regulatory, carbon-related policies, technological, environmental reporting, and expectations from stakeholders. Higher scores indicated greater perceived climate-related risks. Sustainability strategies were the mediating variable, which was measured by the level of sustainability integration into organizational strategies and operations. Included in this construct were practices of energy efficiency, renewable energy, reduction in emissions, waste management, sustainable sourcing, environmental innovation, sustainable supply-chain practices, and assessment of climate risk.

The scores were higher the more committed to strategic practices that were sustainable. Organizations' capacity to anticipate, absorb, adapt to, and recover from disruption was the dependent variable, or corporate resilience. The construct comprised organizational preparedness, operational flexibility, reconfiguration of resources, learning from past disruptions, response capability, and continuity of business operations in uncertain times. The higher the scores, the stronger the capability in resilience was. The researcher controlled a number of organizational features, namely firm size, firm age, industry type, ownership structure, and organizational experience. These were added to make sure that the relationships between the key constructs would not be affected by fundamental differences in the way they are organised.

Variance Inflation Factor (VIF) was also checked for multicollinearity of constructs. Measurement reliability was determined, and then the structural model was evaluated after the measures were found to be reliable and valid. Path coefficients were used to analyze the relationships between the variables in terms of both magnitude and direction. Bootstrapping procedures were used to test the significance of the relationships.

There is a significant indirect effect that provides evidence of the sustainability strategies' ability to explain the effect of climate-related pressures on organizational resilience. Common method bias was a possibility because all variables were taken from the same respondents. This risk was minimised by providing

confidentiality, writing the questions clearly, and using neutral language. Common method variance (CMV) tests were also run to check for common method variance.

Ethical guidelines were adhered to during the entire research process. Participation was voluntary, and before giving their answers, the respondents were informed of the purpose of the study. Inappropriate personal data was not collected, and organisational personal data were kept confidential. The information gathered was solely for academic purposes, and any conclusions were reported in group form so as to protect the anonymity of the individuals or organizations. It was also the right of participants to withdraw from participation without giving their responses.

Results and Findings

210 questionnaires were sent to managers from the sectors sensitive to climate change. Of the 201 questionnaires returned, 177 questionnaires were complete and usable, giving an effective response rate of 84.0%. The respondents held various managerial roles ranging from senior management, operations management, sustainability and environmental management, supply-chain management, finance, and strategic planning. 31.4% of respondents were senior managers and 46.6% were middle-level managers.

The other participants held specialised functions or supervisory roles in the field of sustainability, operations and strategy. The sampled companies covered various sectors related to climate, such as manufacturing, energy, construction, logistics, textiles and food processing. The three largest manufacturing groups were made up of manufacturing firms (32.0%), energy (18.8%), and construction (16.5%).

Other manufacturing groups accounted for 13.6%, textiles 10.7%, and other industries 8.4%. In terms of organizational size, 24.6% of the companies were small organizations, 41.1% medium-sized companies, and 34.3% large companies. Respondents were from companies with experience of more than ten years, suggesting that most of them were from companies with sufficiently long operating experience to assess the climate risks and capacities.

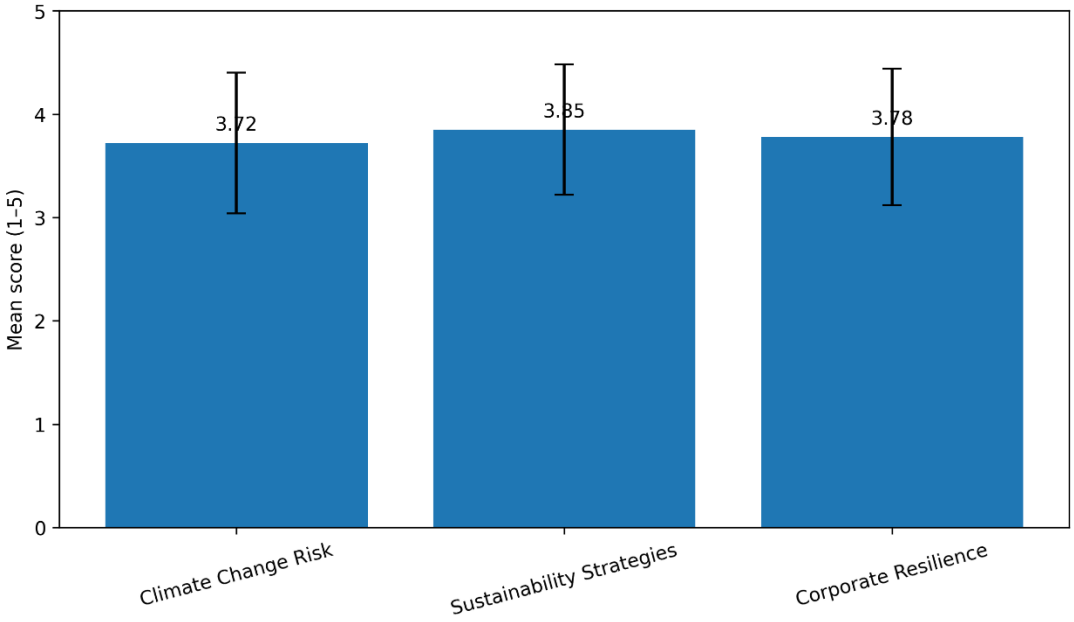


Figure 2: The Descriptive Statistics of Main Constructs.

Three main constructs are calculated using descriptive statistics. The mean score of climate change risk was 3.72 (SD = 0.68), which may be considered as moderately high risk of exposure to climate change physical and transition risks. The mean score for sustainability strategies was 3.85 (SD = 0.63), indicating that companies had implemented sustainability practices to a fairly high level.

The overall mean score for corporate resilience was 3.78 (SD = 0.66), which was indicative of respondents' perception of their organization having "reasonable" levels of ability to anticipate, adapt, and recover from disruptions. These findings show that climate risk, sustainability, and resilience are considered relevant strategic issues by the participating organizations.

Indicator reliability, internal consistency reliability, convergent validity, and discriminant validity were used to evaluate the measurement model. The outer loadings were between 0.716 and 0.884, which is higher than the recommended value of 0.70. The indicator reliability ranges for climate change, sustainability strategy, and corporate resilience were from 0.724 to 0.861, 0.716 to 0.884, and 0.738 to 0.872, respectively, which is satisfactory.

Reliability analysis indicated good internal consistency. The items of climate change risk had a Cronbach's alpha of 0.879 and a composite reliability of 0.908. The sustainability strategies obtained 0.901 and 0.922 as values, and corporate resilience obtained 0.892 and 0.917 as values, respectively. None of the values were below the recommended level of 0.70

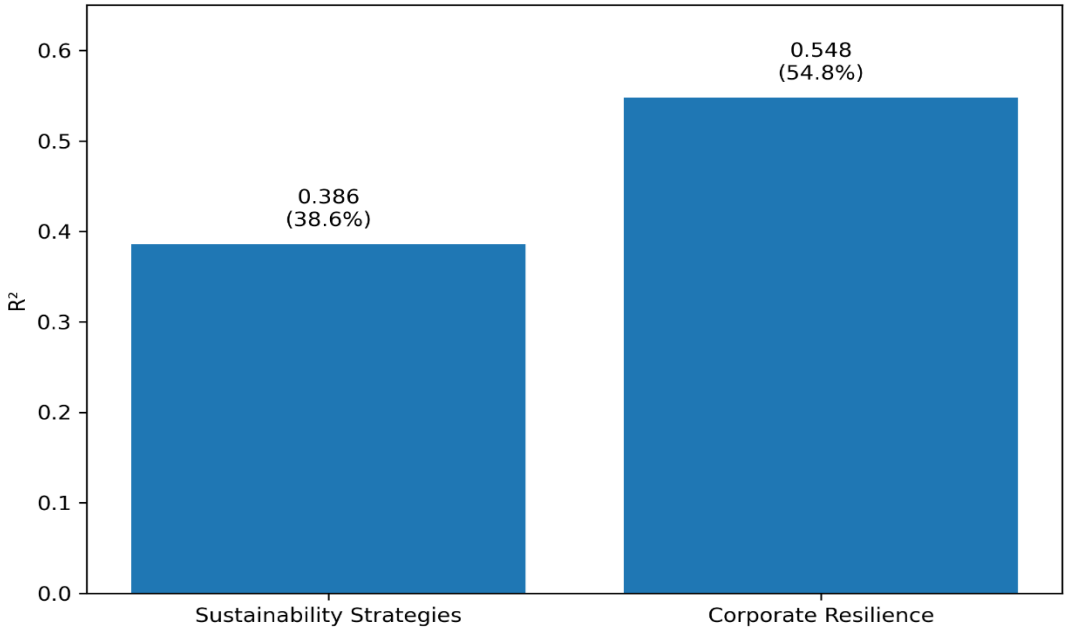


Figure 3: Structural Path Coefficients.

Average Variance Extracted (AVE) was used to validate convergent validity. The scores for climate change risk, sustainability strategies, and corporate resilience were all above the acceptable level of 0.50, with 0.623, 0.664, and 0.647, respectively. HTMT ratios were used to assess discriminant validity. These values ranged from 0.681 to 0.782 and were always below the recommended value of 0.85. This indicates that the three constructs are separate constructs.

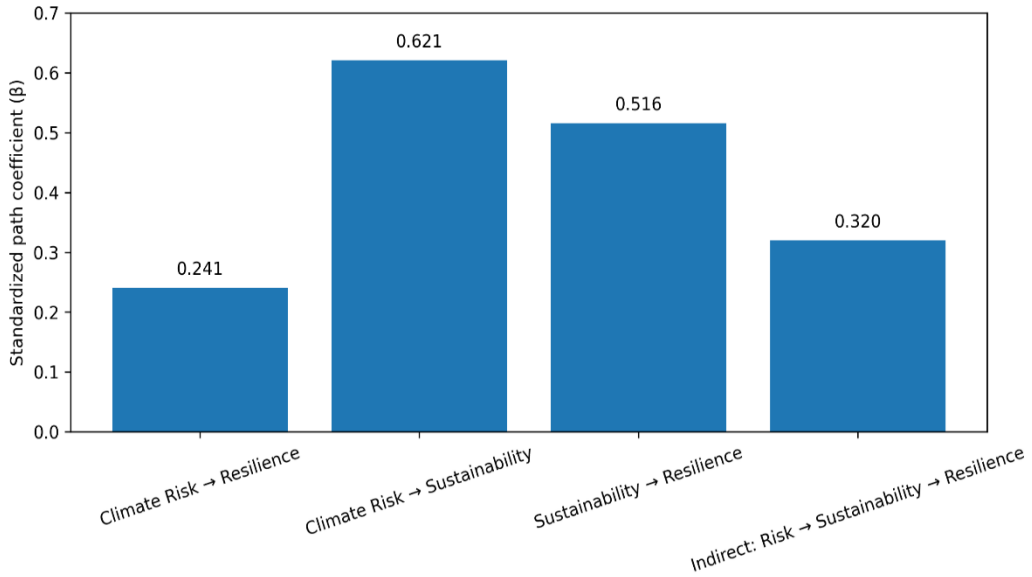


Figure 4: Variance of Endogenous Constructs.

The hypotheses were tested with resamples of data using the bootstrapping method. H1 stated that climate change risk is a major factor in corporate resiliency. The results confirmed this relationship as indicated by the positive and significant relationship found ($\beta = 0.241$, $t = 4.186$, $p < 0.001$). The confidence interval did not contain zero, so it was confirmed that H1 was supported. This means that the higher the climate pressures on an organisation, the better their resilience can be built through preparedness, risk management and adaptation measures.

Table 1: Structural Model Results and Hypothesis Testing.

Hypothesis	Relationship	Path Coefficient (β)	t-value	p-value	Result
H1	Climate Change Risk → Corporate Resilience	0.241	4.186	<0.001	Supported
H2	Climate Change Risk → Sustainability Strategies	0.621	11.473	<0.001	Supported
H3	Climate Change Risk → Sustainability Strategies → Corporate Resilience (Mediation Effect)	0.320	7.112	<0.001	Supported

H2 suggested that climate change risk has a positive effect on sustainability strategies. The findings showed a strong positive relationship ($\beta = 0.621$, $t = 11.473$, $p < 0.001$), supporting H2. This indicates that as climate risks increase, the organizations will be more willing to embrace sustainability actions, such as improving resource use, implementing cleaner technologies, sustainable procurement, and environmental management.

H3 research focused on understanding if there was a mediating effect between climate change risk and business resilience through sustainability strategies. The indirect effect was positive and significant ($\beta = 0.320$, $t = 7.112$, $p < 0.001$), and the confidence interval did not contain 0. The findings suggest that both the direct climate change risk-resilience link and the indirect link via sustainability strategies were relevant, as both were found to be significant.

Discussion

This study explored the climate change risk–corporate resilience link and the mediating effect of sustainability strategies in this link. The results corroborate the conceptual framework and illustrate that climate-related risks cause not only disruption to organizations but also trigger strategic adaptation. The findings show that having a higher score for climate-related pressures is significantly related to having a

sustainability strategy, and that a sustainability strategy makes a significant contribution to corporate resilience.

The first hypothesis made was that there is a strong relationship between climate change risk and corporate resilience. The results confirm this relationship and indicate that companies facing more climate-related risks have increasingly advanced means of preparing for, managing, and recovering from climate disruption. While working problems with climate risk is often seen as a challenge for operational and financial management, the results show that awareness of climate risk can also drive organisations to enhance their preparedness, strengthen risk-management systems, diversify their resources and boost operational flexibility. This connection exemplifies the dynamic nature of resiliency. Corporate resilience is more than just being able to bounce back after an event; it is about preparing for events, learning from uncertainty, adjusting strategies, and realigning resources. Climate-related risks can either pose vulnerability or spur increased adaptation capabilities, including extreme weather events, disruptions to supply chains, resource scarcity, and regulatory changes.

The second hypothesis was whether climate change risk has an impact on sustainability strategies. The results confirm this link: businesses with more physical and transition risks have a higher probability of implementing sustainability-related practices. Climate pressures can highlight vulnerabilities in current business models and drive organizations to adopt strategies that will lessen their vulnerability.

In the case of energy uncertainty, companies might invest in renewable energy and efficiency measures, whereas companies with resource scarcity might consider implementing conservation measures and sustainable resource management practices. Boosting regulation and stakeholder expectations, on the other hand, could drive companies to cut emissions, invest in cleaner technologies, invest in sustainable sourcing practices, and enhance their environmental management systems. The results of this study indicate that sustainability initiatives are not just 'environmental duties' or 'environmental compliance' actions. Rather, they are more strategic moves which enable businesses to respond to uncertainty, be more efficient and competitive in the future. The link between climate risk and sustainability adoption clearly shows how environmental issues can drive organizational change.

The third and most important finding relates to the mediating role of sustainability strategies. The results show that sustainability strategies are significant mediators between climate change risk and corporate resilience. This implies that resilience is not a foregone conclusion when climate risk occurs; it's having an organization that is able to deal with or react to climate-related risks in a resilient way.

Different levels of resilience outcomes are possible across organizations, as they embark on strategic actions that include degrees of exposure to climate change. Vulnerable companies relying on critical resources, inefficient processes and limited suppliers are likely to suffer more disruption. Companies that invest in sustainable technologies and resource efficiency, renewable energy, supplier diversification, and climate-

risk management, on the other hand, could build up the capacity to withstand and adjust to environmental uncertainty.

Sustainability strategies have multiple mechanisms of increasing resilience. Resource efficiency helps to cut down on the reliance on limited resources, sustainable supply-chain practices help to increase flexibility, environmental innovation helps to cope with technological and regulatory shifts, and climate-risk assessment helps to prepare the organization. So, sustainability initiatives not just make a difference for the environment; they also play a crucial role in ensuring operational continuity and strategic adaptability.

The results are also of management significance. Strategic planning, investment decisions, supply chain and operations should all account for climate-related risks in the management of the business. Companies can increase their resilience through energy efficiency, renewable energy, supplier diversification, investment in environmental innovations, and climate-risk assessments.

Theoretical and Managerial Implications

The results of this study make significant theoretical contributions to the literature on climate change risk, sustainability, and corporate resilience. Most importantly, the study expands the thinking about corporate resilience from a reactive to a proactive perspective and suggests that resilience is an organizational capacity for adaptation rather than simply a reaction to disruption. The study shows how environmental pressures can drive and/or catalyze the development of strategic capabilities that enhance adaptation and longer-term continuity, connecting climate change risk, sustainability strategies, and resilience.

Second, the study adds to the use of Dynamic Capabilities Theory in the climate and sustainability context. The results indicated that organizations react to climate-related uncertainty in three ways: sensing climate threats, enacting strategic responses with sustainability practices, and transforming resources and organizational capacities to enhance climate resilience.

Hence, sustainability efforts are not just about complying, but also about being a strategic capability. Third, the study advances research in sustainability and resilience by showing that sustainability and resilience are interrelated. This means that cutting down on resources, introducing renewable energy, sourcing sustainably, innovating environmentally, and tackling climate risks can all help to enhance organization-level environmental performance while also boosting resilience. This is in keeping with the notion that sustainability and resilience are two interrelated strategic goals.

For management, the results show that the organizations must view climate change risk as an issue of their business and not just an environmental problem. Climate-related risks should be embedded in strategic planning, investment decisions, operations, and supply chain management processes. Identifying climate vulnerability early can aid companies in making proactive responses prior to risks bringing about considerable interruptions.

Conclusion, Limitations and Future Research

The goal of this research was to explore climate change risk and corporate resilience shielded by sustainability strategies. The results indicated that the impacts of climate change can affect organizations both directly through disruption and indirectly by driving organizational strategies to build resilience.

The results of the study show that sustainability strategies, such as resource efficiency, reduction of emissions, use of renewable energy, sustainable sourcing and the management of climate risks, can improve the preparedness, flexibility and adaptive capacity of the organization. The focus on sustainability must thus not only be about an environmental duty but also a strategy for dealing with uncertainty and securing long-term competitiveness.

The study has a number of drawbacks, however. First, the cross-sectional research design restricts the ability to understand the development over time of climate risks, sustainability strategies and resilience. Longitudinal studies can be used to study changes in organizational adaptation in future research.

Second, the information in the study is based on managerial perceptions, thus bringing in subjectivity. Future research may integrate survey responses with objective metrics like emissions data, sustainability ratings, financial performance metrics, and operational disruption data.

Thirdly, the study is limited to a few constructs. Leadership commitment, organizational culture, technological capability, financial resources, and stakeholder pressure are other potential moderators or mediators that could be explored in subsequent research. Lastly, the importance of climate risks varies from industry to industry and region to region. Future studies could provide comparisons between sectors and countries to see if the suggested relationships are the same in other environments and institutions. Additionally, researchers can study specific sustainability practices, including sustainable supply-chain management, green innovation, and circular economy practices, to find which practices are most effective towards resilience.

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