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Preparedness and Adaptation: A South African Perspective on Emerging Corporate-Level Adaptive Strategies in Response to Climate Change Risks

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Abstract: Objective: This paper investigates how South African firms are responding to climate change, focussing on how they interpret climate risk and embed adaptive strategies into corporate activities and decision-making. As part of the analysis, we assess cross-sector differences in the formulation of adaptive strategies. **Prior Work:** Existing research has examined climate risk disclosure, yet limited attention has been paid to how firms develop and operationalise corporate adaptation strategies, particularly in developing-country contexts. **Approach:** The study adopts a qualitative research design based on semi-structured interviews with corporate actors occupying strategic and sustainability-related roles across multiple sectors in South Africa. **Results:** The findings reveal a shift in firms' perceptions of climate change from a compliance-oriented environmental issue to a strategic concern shaping risk management and operational planning. While sector-specific differences exist in approaches, firms demonstrate common patterns in adaptive strategy formulation driven by regulatory pressures and resilience building objectives. **Implications:** The study contributes to the corporate-level adaptation literature by mapping the emerging adaptive strategies implemented in response to climate change risks. **Value:** The study provides a cross-sectoral analysis of emerging corporate-level adaptive strategies from a South African perspective. It goes beyond conventional narratives by bringing into focus the often overlooked yet much-needed understanding of the intersection between vulnerability, resilience building, persistence, transformability, and adaptation in the corporate sector.

Keywords: climate change risk; corporate adaptation; adaptive strategies; organisational resilience; South Africa

JEL Classification: G

1. Introduction

Climate change adaptation is a key target of the United Nations Sustainable Development Goals (UNSDGs) to be achieved by the year 2030. Specifically, Goal 13 calls for climate action and

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implores all socio-economic systems to initiate strategies that addresses the far-reaching impacts of climate change. This compels joint and collaborative efforts from both the public and private sectors. Many African governments are characterised by limited adaptive capacity (IPCC, 2014), where the private sector plays a critical role in making climate change adaptation a reality (Alam et al., 2024; Arian & Sands, 2024). While the sector has historically encountered a variety of external pressures, climate change introduces a new set of risks that requires innovative and evidence-based responses (Orsato et al., 2017). From a corporate perspective, climate risk refers to impacts on performance arising from damage to facilities, policy changes, or shifts in market conditions (Doran & Quinn, 2009). Although there has been growing academic attention in recent years (Scholten et al., 2020), adaptation among private-sector organisations in South Africa and the wider Global South remains uneven.

Climate-related risks are intertwined with business operations. They are regarded as inseparable from business activities (Krueger et al., 2020; Matsumura et al., 2024). Consequently, the critical importance of building corporate-level resilience and adaptive capacity cannot be overstated. Climate change exposes firms to multiple forms of risk. Physical risks arise from extreme weather events such as floods, droughts, hailstorms, and heatwaves (Gahramanova & Kutlu Furtuna, 2023), while transition risks stem from evolving policies and shifting consumer preferences (Abhayawansa & Adams, 2022; Alsaifi et al., 2022; Matsumura et al., 2024). Taken together, these risks have a negative impact on all economic sectors and have significant implications for firms' assets, infrastructure, supply chains, markets (Arian & Sands, 2024) and long-term sustainability. Transparent communication of adaptive strategies, therefore, enables both companies and stakeholders to better understand organisational capacity to respond to these risks (IFRS Foundation, 2022).

Private sector organisations have several options for addressing climate-related risks (Hossain & As-Saber, 2024). They may focus on mitigation, adaptation, or a combination of the two. Mitigation involves actions aimed at reducing greenhouse gas emissions, which are identified as the primary drivers of climate change (IPCC, 2014; NASA, 2021). Adaptation, conversely, largely focuses on designing and implementing strategies that addresses the consequences of climate change (West & Brereton, 2013). Evidence shows that the Global North contributes disproportionately to global emissions compared to the Global South (IPCC, 2018, 2019; O'Neill et al., 2017). Accordingly, our study prioritises adaptation, which is more immediately relevant for countries and firms in the Global South, where emissions are lower but vulnerability to climate impacts is significantly higher.

A substantial body of literature examines what scholars refer to as the 'the politics' of climate change adaptation within the corporate sector (Abhayawansa & Adams, 2022; Alsaifi et al., 2022; Arian & Sands, 2024; Ben-Amar et al., 2023; Galeone et al., 2023; Hossain et al., 2017; Hossain & As-Saber, 2024; Kouloukoui et al., 2019; Nguyen et al., 2024). This important work has explored climate change issues from a corporate perspective and has laid a strong conceptual foundation. However, most of these studies appear to generally focus on corporate-level disclosure of climate change risks and opportunities, with comparatively limited attention to corporate-level adaptive strategies. Moreover, this literature is heavily concentrated in the Global North – particularly in Australia – resulting in a scarcity of evidence from the Global South.

Borghei et al. (2024) observe that strategy-related information in the Global South is often inadequate and fragmented. There is a need for a nuanced understanding of how firms have started responding to climate change risks. This need is both timely and critical as the year 2030, a target set by the United Nations, approaches. Enhanced information on adaptive strategies can help stakeholders assess the

actions firms are undertaking to address climate change impacts (Galeone et al., 2023) and support more informed investment decisions (IFRS Foundation, 2022, 2023).

Our aim is to develop a rich, first-hand understanding of emerging corporate strategies designed to address climate change risks and opportunities. Information on such strategies can assist stakeholders in objectively assessing how firms manage climate impacts and the resilience of their responses. (Hossain & As-Saber, 2024; IFRS Foundation, 2023). The IFRS Foundation (2023) highlights strategy and strategic resilience as critical inputs for investment decision-making. Although it provides guidance on climate-related disclosures (Kulik & Dobler, 2023), it does not explicitly prescribe specific corporate-level strategies, resulting in substantial variation across firms. Many firms adopt either a "proactive" or "reactive" approach (Hossain & As-Saber, 2024, p. 16).

South Africa provides a particularly relevant context for examining corporate responses to climate change due to its unique socio-economic and environmental conditions. The Climate Change Act No. 22 of 2024 establishes a coordinated national response and sets out a climate change adaptation strategy to 2030, aligned with the Paris Agreement. Despite the policy framework, corporate adaptation strategies remain uneven and inconsistent (Hossain and As-Saber, 2024). We, therefore, attempt to address the following interrelated research questions:

RQ1: How do companies interpret climate change risks and corporate level adaptation?

RQ2: What adaptive strategies has the corporate sector implemented in response to climate-related risks and opportunities?

We seek to address these questions by deploying a qualitative approach (Finch, 2018) to have an in-depth understanding of emerging adaptive strategies. This method is widely used by researchers because it provides rich, context-specific evidence, in our case, as conceptualised by participants and offers new insights on corporate-level climate change adaptation from a South African perspective. A foremost contribution of our study is that from a Global South perspective, we demonstrate a shift in perception of climate change from an entirely environmental issue to a strategic business imperative that can no longer be excluded from overall business processes. This contribution gives credence to our study and provides context to the overall findings.

The paper is structured as follows. The next section reviews the relevant literature, followed by the methodology, results, and discussion. The final sections present implications for theory and practice, propose avenues for future research, and outline the limitations of the study.

1.1. Problem Statement

Despite the increasing global and academic attention to climate change, there is still limited understanding of how companies in the Global South, particularly in South Africa, are adapting to climate-related risks at the corporate level. Existing studies largely focus on climate risk disclosure and reporting practices (West & Brereton, 2013), with far less attention given to the actual adaptive strategies firms implement to build resilience and respond to physical and transition risks. Although South Africa has introduced policy frameworks such as the Climate Change Act No. 22 of 2024, corporate responses remain uneven and inconsistent across sectors. This lack of clear understanding threatens coordinated approaches to adaptation. As a result, there is need for in-depth and context-specific evidence on how South African firms are developing adaptive strategies, build resilience, and respond to climate change risks and opportunities across different sectors.

2. Related Literature

2.1. Understanding How Climate Change Risks Shape Corporate Activities

Companies across all sectors face exposure to physical, transition, regulatory, and litigation risks associated with climate change (Alam et al., 2024; Arunrat et al., 2022) (Figure 1).

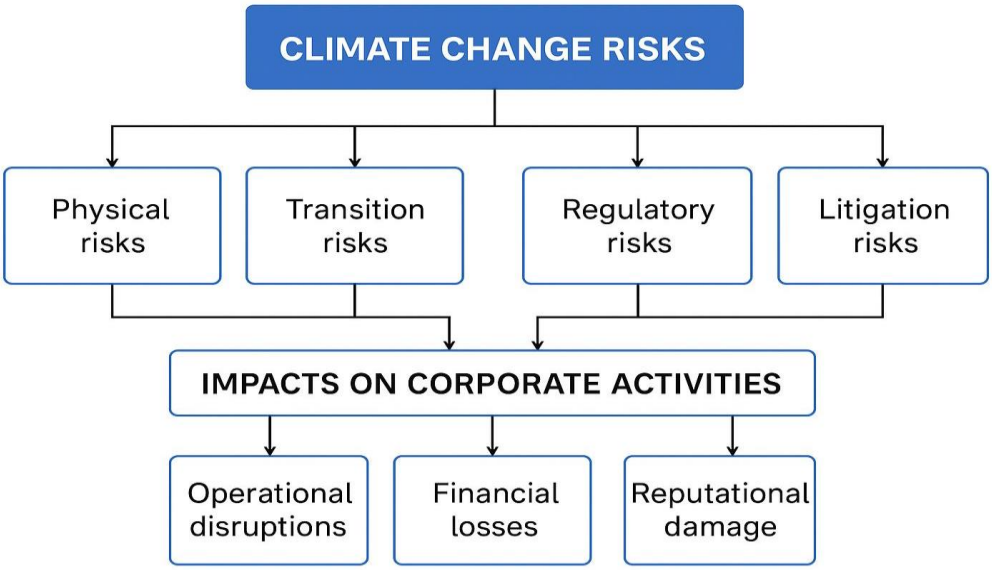


Figure 1. The impact of climate change risks on corporate activities

Source: TCFD (2017)

Physical risks stem from large-scale natural events, while transition risks arise from policy, legal, and technological shifts aimed at climate mitigation and adaptation (Benz-Saliasi, 2020; Krueger et al., 2020; Matsumura et al., 2024). Collectively, these risks have a significantly affect corporate activities (Kouloukoui et al., 2019) and overall business viability. Physical risks, such as floods, can disrupt supply chains and damage critical infrastructure while emerging climate policies may threaten profitability. Additionally, as consumer preference shift toward sustainable products, firms that fail to address climate risks may lose market share.

Although empirical research has examined climate change risks and opportunities disclosure (Goldstein et al., 2019; Nguyen et al., 2024; Panfilo & Krasodomska, 2022), limited attention has been given to firms' adaptive strategies. Arian and Sands (2024) reports that corporate climate risk and strategy disclosure remain inadequate, indicating slow organisational recognition of climate-related risks. Similarly, Kouloukoui et al. (2018) show that 14% of the world's largest companies fail to disclose 'policies, actions, and strategies for mitigating the risks related to climate change' (p. 1252). These gaps require companies to develop and implement effective climate risk mitigation strategies (Alsaifi et al., 2022).

2.2. Contextualising Corporate Level Climate Change Adaptation

Corporate climate adaptation is not just about responding to risk, but it is a strategic extension of evolutionary resilience theory. Holling's (1973) framing of resilience as the capacity to persist, adapt,

and transform under shock implies that adaptation should go beyond recovery. Yet, much of the literature collapses this into a narrow focus on "bouncing back" (Mudefi et al., 2024). These risks reducing adaptation to operational continuity rather than strategic transformation. The IPCC's framing of climate risk as pervasive across sectors (IPCC, 2014) makes adaptation a business imperative not an optional CSR activity (West & Brereton, 2013). However, the process of identifying risk and acting on it is not a simple process. The literature agrees that sector-specific risk identification is the necessary trigger (Benz-Saliasi, 2020; Panfilo & Krasodomska, 2022), but it says little about why many firms stop at identification without moving to action. This suggests a gap between risk awareness and adaptive capacity that institutional and resource constraints likely explain.

At the firm level, adaptation manifests as a range of practices, including policy changes, asset modification, infrastructure replacement, and operational shifts (Perry, 2015; West & Brereton, 2013). Specific actions may differ depending on the sector in response to the climate change risks conundrum. They may involve policy and planning approaches, asset modification, replacement of existing infrastructure or alterations of operations (West & Brereton, 2013). This includes adaptation planning (Perry, 2015). An adaptation plan reflects the company's integrated approach to responding to the impacts of climate change risks. In this plan, a company can be reactive, anticipatory, proactive, or transformative in its response (Hossain & As-Saber, 2024; IPCC, 2012; 2014). Reactive adaptation involves management responding to risks as they occur, while anticipatory adaptation prepares the company for anticipated climate change risks. Proactive adaptation is where the company continuously reviews its strategies (Hossain & As-Saber, 2024). Transformative adaptation includes companies creating new lines of business, markets, and opportunities. These approaches align with the core dimensions of resilience which are preparedness, persistence, and transformability.

2.3. Intersectionality of Resilience Building and Adaptation: Theoretical Framing

Historically, resilience theory has been applied in material science and psychology to explain how metals and humans respond to or 'bounce back' from undesirable situations. However, with the increasing risks of climate change, resilience theory has been extended to the business domain to illustrate "the ability of the business to cope with changes and recover from the adverse impacts associated with the business environment" (Marković & Farooq, 2017, p. 17). This implies that, provided that appropriate strategic approaches are initiated, companies can develop adaptive and transformative capacity that enable them to respond to or 'bounce back' from, the adverse effects of climate change risks. Business can adapt, evolve, and transform in response to changing conditions, disruptions, or uncertainties (Holling, 1973). Resilience building is regarded as a practical approach to managing the risks posed by climate change. When a business adopts a resilience-building perspective, it acknowledges the significance of uncertainties or shocks resulting from climate change and can develop strategies to absorb related disturbances. Corporate-level climate change adaptive strategies are deeply rooted in resilience thinking. Resilience-building interventions involve or at least maintain the well-being of business operations in the context of climate change risks. Resilience is, therefore, what Béné et al. (2015, p. 9) refers to as a 'combination of capacities'.

In his early works on resilience, Holling (1973) describes two types of resilience: ecological and engineering resilience. Ecological resilience focuses on the capacity to absorb disturbance, recover from disruptions, transform and reorganise. Its emphasis is on ecosystem dynamics. It acknowledges uncertainty and surprise. Engineering resilience speaks to the ability of a system to withstand

disruptions, return to its original state and continue operations despite the disruptions (Holling, 1986). It focuses on system functionality. Engineering resilience seeks to mitigate uncertainty through design and control. Both concepts have been applied in climate change adaptation. From an ecological resilience perspective, for example, a company may diversify its supply chains to minimise disruptions caused by climate change. It may design and build infrastructure (West & Brereton, 2013) that can withstand climate change-related stresses. A company can identify, assess, and manage climate change risks, operations, and assets from an engineering resilience perspective or invest in renewable energy sources to improve energy efficiency. Resilience theory explains reporting entities as having adaptability, persistence, and transformability characteristics (Folke et al., 2010) to respond to the effects of climate change. These qualities feed into the 'bouncing back' metaphor as a supportive base for attaining positive and sustainable outcomes in resilience thinking (Holling, 1973).

3. Methodology

The research question supports the obtaining of rich and first-hand insights into emerging corporate-level adaptive strategies in response to climate change risks and opportunities. A qualitative research approach was adopted (Finch, 2018; Seidman, 2006), utilising interviews. Participants occupying strategic roles within their companies were purposively selected based on highest market capitalisation of their respective firms on the JSE. Literature on sustainability disclosures (Arian & Sands, 2024) has consistently shown that when it comes to voluntary disclosure of information in corporate reports, the size of the firm, in most cases, determines the extent of disclosures. In the context of this research study, it means that bigger firms are more likely to disclose climate change information and, therefore, regarded as actively developing or implementing climate-related response strategies (Arian & Sands, 2024; Hossain & As-Saber, 2024).

We employ a purposive sampling strategy (Jonker & Pennink, 2009; Linclon & Guba, 1985) to select respondents on the basis that they possess authoritative perspectives (Mudefi et al., 2024) on corporate-level adaptive strategies. The interviewees (S1 – S18) were drawn from different sectors of the economy, namely, telecommunications (2), construction (3), financial (5), consumer services (2), Tourism (2), Oil and gas (2), and consumer goods (2). Work experience ranged from 6 to 16 years, while designation of those that were interviewed varied and included accountants, sustainability officers, finance officers, and accounting officers. The notion that climate change impacts all sectors is supported in the literature (Alam et al., 2024; Caby et al., 2020), and this was one of the strengths of our sampling approach. The interviewees were experienced in sustainability issues as well as strategy formulation within their companies. Essential to our study is that the participants are involved in reporting or communicating this information to stakeholders, which is a strategic role from a corporate hierarchy.

3.1. Sample Size

Determining sample size is a highly contested issue in qualitative research. However, in studies such as the current one, cardinal to sample selection is the concept of saturation, which means that more data does not necessarily lead to more information (Creswell, 1998; Mason, 2010; Morse, 2000). Depending on the objective of the study, often, the larger the sample, the more repetitive the information becomes (Mason, 2010). Moreover, qualitative research is overly concerned with deriving

meaning rather than hypothesis testing (Jonker & Pennink, 2009). Saturation was a guiding principle in determining a sample size of 18 participants. In line with existing literature (Creswell, 1998; Morse, 2000), at the saturation point, the selected sample was considered significant enough to ensure that most or all the views, opinions, and perceptions important to climate change adaptive strategies were uncovered.

3.2. Ethical Approval, Building Rapport and Trust, and Managing Ethical Dilemmas

Ethical clearance was obtained from the University of Johannesburg, School of Accounting Research Ethics Committee (Ethics clearance number SAREC20240222/02). The research study followed the ethical guidelines of the Research Ethics Committee. Permission was initially obtained from the companies' Chief Executive Officers (CEOs). It was not an easy enterprise because of the time to obtain approval to interview the experts. Some companies that were approached could not approve the request to conduct research in their companies, citing various reasons. Nevertheless, considering the qualitative nature of the study, which sought to gain rich insights into corporate-level strategies, the companies that gave permission were considered sufficient at saturation point.

Building rapport and trust with participants was very important in this study. This includes prioritising relationships and trust and being transparent and honest in the whole process to avoid mistrust and confidentiality breaches. Informed consent was sought from participants, and process confidentiality was emphasised in line with the ethics committee recommendation to anonymise the companies and interviewees. The interviews, which ranged from 30 to 50 minutes, were conducted over a period of eleven months, from May 2024 to March 2025. Three interviews were conducted physically, while fifteen were conducted through Microsoft Teams with the consent of interviewees.

3.3. Analysis of Interview Data

After completing the transcription of the interviews, the data was imported into Atlas.ti, a data analysis software, for coding and analysis. The coding scheme was developed to address the interrelated research questions on climate change risks and the corporate-level strategies employed by reporting entities to address and adapt to climate change risks. To understand the main issues related to climate change risks and adaptive strategies, the coding scheme comprised themes and sub-themes (Feldermann & Hiebl, 2020) (see Figure 2).

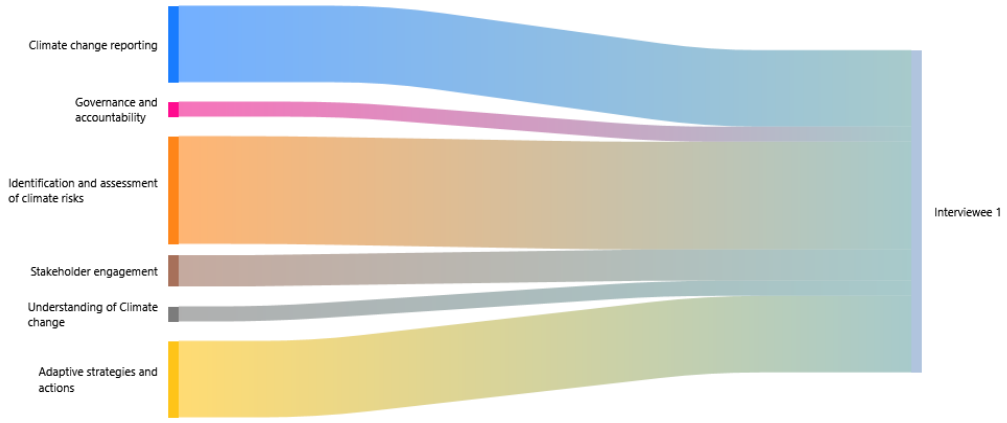


Figure 2. Example of main theme development

Source: ATLAS.ti Extract

This included coded transcripts and relevant codes assigned to specific text segments (Zakaria & Zakaria, 2015). As new 'in vivo' codes emerged during the coding process, existing ones were filtered to ensure the coding process reflected the intricacies of the interview data. Atlas.ti's functionalities, code co-occurrence, and quotation manager were used to identify relationships, patterns, and key quotations. Memos were created to capture interpretations during coding and analysis. This iterative and reflexive approach allowed for the constant revision of the coding scheme and, thus, a refined interpretation of the data set (Braun & Clarke, 2006; Maguire & Delahunt, 2017), leading to a better exploration of climate risks and corporate-level adaptive strategies.

3.4. Research Rigour

Research rigour is vital for producing credible, trustworthy, and valid findings (Lincoln & Guba, 1985). To ensure that the research findings reflected the perspectives of participants, external measures which include member checking and peer debriefing were put in place. In this study, member checking was used to verify the accuracy of the interview transcriptions. Rigour also entailed a strong ethical adherence. This included being issued with an Ethical clearance to carryout interviews.

4. Results

This section presents the results of the often-neglected evidence of corporate-level climate change adaptive strategies. This is explained through the lenses of the resilience theoretical framework. We discuss the themes that characterise the adaptive strategies adopted by South African companies.

4.1. Corporate Level Understanding of Climate Change

The comments from interviewees illustrate that understanding climate change as a business risk is comparative. Companies acknowledge the complex nature of climate change, its associated risks, opportunities, and other challenges. The understanding varies across sectors. According to interviewee S9,

> The issue of climate change is both substantial and multifaceted. Most of our operations are significantly vulnerable to the risks associated with climate change from various perspectives for us as a company. It is regarded as a strategic issue.

Despite the varying understanding, there is consensus on the immediate need for adaptive strategies at the corporate level to address the associated risks and opportunities. According to one of the interviewees, "as a telecommunications company, we identify climate change as a global and national issue requiring immediate action" (Interviewee S1). Interviewee S6 remarked that, "the mention of climate change rings a bell of risks and opportunities in which adaptive strategies should be put in place." The interconnectedness of climate risks, opportunities, and strategy was evident from the comments given by interviewees. They understand that climate change can disrupt important aspects of the business value chain, such as supply chain networks, and impact asset values and the company's customer base. This recognition is consistent with the need for a holistic approach to climate action where climate change risk identification, vulnerability assessment, adaptive capacity assessment, resilience building, and disclosure or reporting should be fused into the company's overall business strategy.

4.2. Definition of Climate Change

Climate change was characterised and defined climate change in various ways. Their definitions mainly reflected their sectoral experiences and perspectives. Climate change and its associated risks and opportunities are identified from a sectoral perspective rather than a broader and homogenous one. Interviewees, in this regard, contextualised and interpreted climate change from their sectoral experiences. Some experts provided a more scientific interpretation of climate change, emphasising the role of greenhouse gas emissions in causing climate change and the need for emission reduction. According to one interviewee,

> Greenhouse gas emissions cause climate change, which is associated with risks and opportunities in which businesses and other social systems must implement measures to adapt to the consequences of the risks and opportunities (Interviewee S13).

Others focus on the practical implications of climate change to businesses, highlighting its potential impact on their operations, supply chains, and customers. "As a telecommunications firm, we highlight and identify climate change as a critical issue which can impact our infrastructure, requiring immediate action" (Interviewee S1). The understanding and interpretation of climate change and its associated risks and opportunities from the perspective of the construction sector are shown in the following comment:

> From the construction sector's perspective, climate change is a significant issue that can disrupt operations, not only from our company's point of view but also from a sectoral perspective. It poses significant risks, especially from a construction sector's perspective. Floods and hailstorms might be fatal to construction activities (Interviewee S2).

Although listed entities have not reported climate change information on a full scale within corporate reports, they understand the nature of climate change, its associated risks and opportunities, its impact on business operations, and the need for corporate-level adaptive strategies.

4.3. Risks and Opportunities

Interviewees identify climate-related risks, including physical risks (e.g. extreme weather events, flooding, heatwaves), transitional risks (e.g. policy changes, market shifts, technological advancements), and liability risks. These specific risks vary across sectors, with some industries, such as construction and agriculture, particularly vulnerable to physical risks, and sectors, such as oil and gas, are vulnerable to transition risks. According to one of the experts, "physical risks, including water scarcity, can potentially disrupt our supply chains. This also includes extreme weather events, which can disrupt specific operations" (Interviewee S14). This was supported by one of the interviewees,

> The risks include policy risks that have the potential to result in the obsolescence of some of our important assets or require significant modifications. In addition to physical risks, regulatory and compliance risks are evident from an industry perspective (Interviewee S8).

Although climate change is associated with corporate-level risks and opportunities, the interviewees also recognised the potential for opportunities, such as developing new technologies and access to new markets, transitioning to renewable energy sources, and improving resource efficiency. From the banking sector's perspective, an interviewee highlights the opportunity for green financing, stating, "we have started financing agricultural methods that are sustainable in the long term. This is in addition to renewable energy financing, which we are also undertaking" (Interviewee S3).

4.4. Climate Change Risk Assessment and Management

Interviewees detailed how their respective companies assess and manage climate change risks in the short to medium term. This includes employing frameworks and methods to identify and assess their exposure to climate-related risks, albeit challenging, daunting and costly for listed companies, highlight the delicate nature of climate change risk assessment approaches. Some companies make use of existing approaches, such as 'scenario analysis' (Interviewee S8), 'vulnerability and adaptive capacity assessments' (Interviewee S1), and 'stress testing' (Interviewee S2), to assess their level of exposure to climate risks and opportunities. The inclusion of climate risk and opportunity in the overall risk management strategy was a key issue in the interviews. This reflects the increasing acceptance that climate change risks are not isolated but are connected to other business risks.

4.5. Vulnerability Assessment

Respective companies actively assess the vulnerability of their assets and operations to climate change risks. Risk identification, assessment and management correlate with risk vulnerability assessment. The first step is to identify the risks and opportunities specific to the company and then assess the extent to which their operations are vulnerable to the identified risks and opportunities. This involves evaluating the potential impact of climate change on their physical infrastructure, supply chain networks, and customer base. The consumer services sector interviewee mentioned using 'vulnerability maps to pinpoint regions of our operations that are more susceptible to the identified risks' (Interviewee S7), demonstrating a proactive approach by companies seemingly employing several approaches. According to Interviewee S1, the emphasis on vulnerability assessment suggests a forward-looking approach.

4.6. Specific Strategies and Actions

Sustainability experts revealed a wide range of specific corporate-level adaptive strategies that companies are employing. Some strategies are similar across sectors, such as investing in renewable energy sources, sustainable supply chain management, and climate-resilient infrastructure. These reflect the interconnected nature of corporate-level climate change adaptive strategies, which are proactive approaches to climate change risk management and opportunities. The focus on innovation and technology was a key theme emerging from the interviews, implying that listed companies accept the potential for technology to motivate and guide climate action. The observation from one of the experts from the telecommunications sector highlights the commitment to 'generating electricity for our infrastructure through renewable sources by 2026' (Interviewee S16). A sustainability expert from consumer services mentioned their efforts to 'transition our fleet to electric vehicles' (Interviewee S7) as a climate change strategy. The construction sector expert mentioned their goal to 'explore the use of sustainable construction materials' (Interviewee S2), while the consumer goods expert highlighted their focus on 'creating and marketing climate-resistant seed varieties' (Interviewee S9).

> As a financial institution, we believe that we are progressing in our efforts to adapt to climate change's effects. We are currently in the process of introducing green finance products and sustainability-linked loans. Also, we are creating a comprehensive framework for managing climate change risks, enabling us to identify, assess, and mitigate climate-related risks and capitalise on associated opportunities (Interviewee S3).
>
> The most critical aspect is that we have put in place a strategy to guide our operations in relation to climate change. We are dedicated to the future investment in renewable energy sources and supporting climate change research and development in this strategy (Interviewee S18).

These observations by the experts on sustainability provide concrete examples of climate risk mitigation and adaptation initiatives undertaken by companies across different sectors, which, as noted above, range from investing in renewable energy projects and adopting sustainable supply chain practices to developing climate-resilient infrastructure and promoting energy efficiency.

4.7. Stakeholder Engagement

Stakeholder engagement emerged as an important aspect of formulating corporate-level climate change strategy and information reporting. Sustainability experts stressed the importance of communicating climate change information, bearing in mind stakeholder interests to foster transparency and accountability. Aligned with the stakeholder theory, sustainability reporting experts have the unmistakable role of building trust and support for transparency and accountability for adapting to climate change at the corporate level. Interviewees pointed out that their respective companies reflect on stakeholder expectations and concerns for inclusivity when planning climate change strategies. Sustainability experts acknowledged the importance of aligning climate change strategies and actions with stakeholders' needs, expectations, and values, particularly investors, customers, and communities. An interviewee from the construction sector mentioned that their company collaborates with stakeholders to 'ascertain their expectations and concerns' (Interviewee S2) as a commitment to incorporating their views, opinions, and perspectives when making decisions about climate change. Interviewees noted the significance of transparency and accountability in

communicating climate change information to stakeholders. One interviewee valued "transparency in disseminating this information to stakeholders and maintaining an ongoing dialogue regarding their requirements for climate change reporting" (Interviewee S11).

4.8. Technology, Innovation, and Collaboration

The need for embracing technology, innovation, and collaboration to drive corporate-level climate change strategy was highlighted. Exploring new technologies, fostering innovation, and partnering with other organisations to develop climate change strategies was evident from the comments. Interviewee S18 highlighted the importance of 'utilising technology to create customer-resilient solutions' while Interviewee S2 suggested the need for 'collaboration with suppliers to enhance their climate resilience'. These comments and views illustrate the nature of collaborative and innovative efforts required to address the intractable challenges associated with climate change. The emphasis on innovation and collaboration, as remarked by Interviewee S1, "focuses on developing resilient technologies." This suggests a proactive rather than a reactive approach to overcoming these challenges.

5. Discussion

This section discusses the results.

5.1. Conceptualisation of Climate Change and its Associated Risks

The findings show that the understanding of climate change differ across sectors. This depends on factors such as the nature of corporate operations and the level of exposure to risks. Firms that have operations in climate-sensitive sectors, such as construction and agriculture were mainly concerned with physical risks such as floods, droughts, and extreme weather events. On the other hand, firms operating in sectors such as finance and energy were more attentive to transition risks associated with policy changes, technological shifts and stakeholder expectations. These differences may be because of the contextual nature of corporate-level adaptation. This suggest that adaptive responses are more likely to be influenced by industry specific vulnerabilities and institutional pressures (Agrawala et al., 2011). The fundings further shows a shift in corporate thinking. Climate change is no longer viewed in isolation as an environmental issue but as a strategic business issue with the potential to influence competitiveness in the long-term. This shift points to a growing awareness that climate related risks can affect not only supply chains and infrastructure but asset values and market positioning. These findings support prior studies that argue that climate change risks are becoming integrated into mainstream business decision-making processes (West & Brereton, 2013; Agrawala et al., 2011).

5.2. Risk Identification, Assessment, and Management

The findings suggest that climate risk identification and assessment is one of the foundational components of emerging corporate adaptation strategies. This is supported in literature (Dietz et al., 2016; Nurunnabi, 2016; KPMG, 2022). Firms recognise that climate risk cannot be handled in isolation but must be integrated into the broader enterprise risk management frameworks. This reflects

a growing acknowledgment that cliamte change has the potential to disrupt operational processes and supply chains. The use of approaches such as scenario analysis and stress testing suggest that some firms are moving towards more structured and forward-looking climate governance practices. These approaches enable firms to evaluate potential future climate impacts under different conditions and to assess the resilience of current operations and assets (Linnenluecke & Griffiths, 2010; West & Brereton, 2013).

Climate risk is context specific. Exposure to risk varies depending on factors such as geographical location, industry characteristics, infrastructure dependence, and the nature of operations. This reinforces the argument that adaptation strategies cannot be entirely standardised across sectors because firms experience climate risks differently (KPMG, 2022). Consequently, effective adaptation requires company-specific assessments that account for sectoral vulnerabilities and operational realities. While the findings indicate growing awareness and progress in climate risk management, they also suggest that corporate adaptation practices remain uneven. Several interviewees acknowledged that climate risk assessment processes are more complex and costly This implies that although firms increasingly recognise the importance of adaptation, institutional and financial constraints may continue to limit the implementation of comprehensive climate risk management systems, particularly in emerging market contexts.

5.3. Vulnerability Assessment

The findings point out the role of vulnerability assessment. What emerged from the findings is that firms are identifying assets, operations, supply chains and areas that are particularly susceptible to cliamte-related disruptions. This shows that firms are beginning to move beyond general awareness towards more targeted assessments of exposure and adaptive capacity. Vulnerability assessment appears to be both a diagnostic and strategic process. On the one hand, it enables firms to determine where climate-related risks are most likely to occur and the extent to which operations may be affected. On the other hand, it informs the formulation of adaption priorities and resilience-building initiatives. This supports prior studies which argue that vulnerability assessment is essential for determining the urgency and direction of adaptation responses (Agrawala et al., 2011; West & Brereton, 2013). Furthermore, it is noted that vulnerability assessment contributes to proactive adaptation by encouraging firms to anticipate future disruptions rather than responding only after climate-related events occur. This forward-looking orientation is particularly important in the South African context, where several sectors are already experiencing the effects of droughts, floods, water scarcity, and infrastructure disruptions. Firms that invest in vulnerability assessments may be better positioned to strengthen operational resilience and minimise future climate-related losses (Moritz & Neo, 2023). The findings further suggest that vulnerability assessment practices remain at varying levels across firms. Some companies appear to employ formal tools and analytical approaches. This variation may reflect differences in firm resources, technical expertise, governance structures, and sectoral exposure to climate risks (Linnenluecke et al., 2015; Moritz & Neo, 2023; Tang, 2022).

5.4. Formulation of Specific Strategies and Actions

Some specific strategies include establishing targets for adopting renewable energy sources, plans for climate change adaptation, and consolidating climate change issues into the overall strategic planning

processes. Some companies are channelling financial resources towards renewable energy projects, embracing sustainable practices across the value chain, and developing physical infrastructure resilient to the impact of climate change. These strategies span sectors and obtain support from extant literature (Moritz & Neo, 2023; West & Brereton, 2013). The literature suggests that building resilience involves infrastructure improvements, such as constructing higher flood dams and capital activities, for instance, in order to strengthen resilience (Tang, 2022; West & Brereton, 2013). This should include allocating capital to a specific infrastructure to safeguard the asset throughout its lifespan (West & Brereton, 2013).

Strategy also includes stakeholder engagement. Sustainability experts stressed the importance of communicating climate change information, bearing in mind stakeholder interests to foster transparency and accountability. Aligned with the stakeholder theory, sustainability reporting experts have the unmistakable role of building trust and support for transparency and accountability for the adaptation of climate change at the corporate level. This line of thinking is supported by Donaldson and Preston (1995) and Fernando and Lawrence (2014), who state that companies should consider all stakeholders' interests, not only shareholders.

The importance of alliances and partnerships at the sectoral level is foregrounded. Sustainability experts underscored the increasing need for collaboration with other companies, non-governmental organisations (NGOs), and the government to share knowledge, develop best practice adaptive strategies, and step up climate action at the corporate level. From a corporate reporting perspective, the most important issue or strategy, according to the experts, is communication (reporting) of this information to stakeholders for decision-making. Sustainability experts underlined the need for communication in the reports of processes, procedures, and adaptive strategies. Without disclosure, stakeholders might not be aware of the efforts made at the corporate level of companies to address climate change. According to the literature, disclosure is a strategy that allows stakeholders to understand climate change risks, opportunities, and strategies (West & Brereton, 2013), promoting trust and inclusivity between a company and its stakeholders (Street & Jude, 2019). Given stakeholders' reliance on corporate reports for judgement and decision-making, it is essential to effectively communicate climate change information (Street & Jude, 2019).

Interviewees, however, detailed the challenges associated with climate change corporate-level adaptation, strategy formulation and reporting these issues to stakeholders. However, some interviewees reported that their respective companies face challenges related to climate change, including data availability, as well as the ever-changing regulatory environment.

5.5. Ecological and Engineering Resilience in Climate Change Adaptive Strategy Formulation

Our analysis underscores the centrality of ecological and engineering resilience in corporate-level climate change adaptation and resilience building in light of the risks and opportunities posed by climate change. Ecological and engineering resilience include the important dimensions of adaptability and transformability. The adaptability dimension of resilience underscores the significance of listed companies being proactive in order to adapt to the impacts of climate change. These variables also feed into the preparedness and persistence dimensions of resilience. Preparedness is demonstrated in this study, where listed companies have acknowledged that climate change risks pose significant threats to their operations, both now and in the long term. In light of this, they have begun to initiate adaptive strategies at the corporate level. Considering that some companies have already been affected

by risks such as floods and drought, they have demonstrated their innovative capacity and transformability characteristics to adapt.

Resilience building relies on reducing vulnerability, pursuing social and institutional learning capacities, and achieving better governance to enhance adaptation (Moritz & Neo, 2023). Companies must continuously strive to build resilience for existing operations and assets. This involves focusing on infrastructure improvements, such as the construction of higher flood dams and capital activities that can enhance resilience (Tang, 2022; West & Brereton, 2013). This should include allocating capital to a specific infrastructure to safeguard the asset throughout its lifespan (West & Brereton, 2013).

6. Limitations

Given the contested nature of sample size in qualitative studies, one of the limitations of our study relates to the methodological approach. However, given that our study focussed on obtaining rich insights into emerging strategies, saturation was used as a guiding principle for determining sample size. At the saturation point, the sample size was significant enough to uncover most or all views, opinions, and perceptions important to climate change adaptive strategies. The normative assumption, which suggests that resilience-building and adaptation strategies inherently lead to positive outcomes, might be interpretively biased. In the face of climate change risks, companies may bounce back to either what experts call a 'better-off' or 'worse-off' position (Mudefi et al., 2024).

7. Conclusion

The research paper illuminates the intricacies of emerging corporate-level climate change adaptive strategies in response to risks and opportunities, showing the interplay between vulnerability, resilience building, and corporate sustainability. The analysis of comments from experts provides an overview of a corporate landscape that has become aware of the need to develop corporate-level adaptive strategies to address the challenges and opportunities associated with climate change. To this end, although not all companies are doing so at a full scale, most are addressing climate change risks through various strategies. These include strengthening supply chains, investing in resilient infrastructure, risk assessment, stakeholder engagement, implementing governance structures that focus on climate change, and investing in innovation and technology. While challenges are evident, sustainability reporting experts show how their companies are committed to contributing to climate change adaptation. The study further established that corporate-level adaptive strategies vary from sector to sector. Some companies are more concerned about the physical risks of climate change, such as floods and drought, while others are more concerned with transition risks, such as policy changes. Companies can adapt and transform themselves through ecological and engineering resilience by initiating adaptive strategies. The findings underscore the significance of identifying risks and opportunities specific to the company and sector, assessing how likely they impact corporate activities, and initiating strategies and actions to build resilience. In conclusion, the analysis supports the need for a holistic approach to climate change risk and adaptive strategy communication to stakeholders.

8. Implications for Theory, Practice, and Future Work

To the author's knowledge, this study is one of the first attempts to explore emerging corporate-level adaptive strategies from a cross-sectoral perspective. We add new insights into the dynamics of corporate-level climate change adaptation. Although ecological and engineering resilience places the ability to 'bounce back' in the face of climate change risks solely on reporting entities, our study insists that individual companies may not achieve the complex and multifaceted nature of corporate-level resilience building and adaptation independently. In order to be successful, the process requires collaborative and sustainable strategies to address the intertwined challenges of climate change. This requires the involvement of all the stakeholders.

The study also contributes to the field of climate change reporting. Although the existing recommendations of the recently established standards on climate change reporting require companies to report on climate change risks, opportunities, strategies, and the resilience of the strategies, they do not, however, prescribe the actual strategies that companies should implement to address the impact of climate change. Thus, as an extension of the recommendations and standards, this study contributes to the holistic reporting of adaptive strategies in corporate reports. This will culminate in improved corporate-level risk management, increased stakeholder transparency and accountability on climate change strategy, and corporate resilience. Comparative studies integrating policy-level changes across sectors may be conducted to better understand sectoral climate change adaptation. Given that our analysis focused on private-sector adaptive strategies. Future work can also focus on the interplay between public and private sector adaptive strategies.

Appendix

Appendix 1. Interviewee demographics

Interviewee	Economic Sector	Designation	Work Experience
S1	Telecommunications	Sustainability officer	6.5 years
S2	Construction	Accountant	9 years
S3	Financial	Finance officer	11 years
S4	Consumer services	Sustainability officer	9 years
S5	Tourism	Finance officer	7.5 years
S6	Financial	Accounting officer	8 years
S7	Consumer services	Chief finance officer	11 years
S8	Oil and gas	Accounting officer	13 years
S9	Consumer goods	Accountant	10.5 years
S10	Consumer goods	Finance officer	16 years
S11	Financial	Accountant	9.5 years
S12	Financial	Accountant	6 years
S13	Telecommunications	Accountant	13 years
S14	Tourism	Sustainability officer	9 years
S15	Construction	Accountant	11 years
S16	Construction	Finance officer	4.5 years
S17	Financial	Sustainability officer	14 years
S18	Oil and gas	Accountant	8.5 years

Source: Interviews (2024-2025)

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