

Original Research

Integrating Climate Risk into Environmental Management Accounting: Institutional Pressures and Organisational Responses in Zimbabwe

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Abstract

This study explored how organisations in Zimbabwe integrate climate risk into Environmental Management Accounting (EMA) and how this enhances sustainable value creation. The study adopted the Institutional Theory and the sensemaking lens. It employed an inductive, interpretivist, qualitative research design, utilising in-depth interviews with 11 senior professionals in accounting, operations, non-governmental organisations (NGOs), sustainability, and regulatory positions. Climate risk awareness was found to be primarily driven by global investors and standards (normative and mimetic pressures), rather than by weak local coercive enforcement (coercive pressures). Although EMA practices are developing, their application remains fragmented, and their integration into basic accounting systems is only partial, with organisations employing techniques such as internal carbon pricing, environmental cost accounting, and material flow accounting. Key barriers to EMA-climate integration include weak regulatory enforcement, limited financial resources, insufficient data, and managerial attitudes. In addition, participants viewed EMA-enabled climate issues as strategic and linked them to improved resource efficiency and resilience, thereby creating long-term value. The findings of the study extend Institutional Theory by highlighting the depth of EMA-climate integration and the role of organisational sensemaking in this process. The findings of this study provide rare empirical contextual evidence on EMA-climate risk integration in a resource-constrained emerging economy. The study's findings offer insights



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for policymakers to develop carbon accounting guidelines and for organisational management to formalise climate accounting and embed sustainability into decision-making.

Keywords

Environmental Management Accounting (EMA); climate risk integration; sustainable value creation; climate change management; emerging economies; organisational responses; environmental accounting

1. Introduction

Climate change, which is being felt worldwide, has emerged as a significant challenge for modern organisations, fundamentally altering the processes of risk identification, measurement, and assessment in accounting and decision-making [1]. The escalating vulnerability to climate-related challenges, including catastrophic global weather events, evolving regulatory standards, and resource scarcity, has compelled organisations to shift from conventional reporting methods to modern sustainability reporting systems that embed environmental considerations in their core managerial processes [2]. This has led to Environmental Management Accounting (EMA) gaining prominence as an essential mechanism for capturing environmental costs, enhancing transparency, and supporting sustainability-oriented decision-making [3].

Despite growing calls and pressure on organisations to incorporate climate risks into EMA, this remains inconsistent and underexplored, especially in developing countries. Existing studies on the issue have tended to focus on developed economies, emphasising quantitative assessments of environmental performance and thereby overlooking the organisational process and managerial interpretations that underpin the practical implementation of EMA systems [4]. This has created a significant gap in understanding how organisations, especially in resource-constrained environments, internalise and implement climate risks within their accounting systems to facilitate value creation [5]. This study has been motivated by the scarcity of empirical research on how resource-constrained organisations in emerging markets such as Zimbabwe incorporate climate risk considerations into EMA systems and how these practices shape strategic responses to sustainability challenges. Zimbabwe, as an emerging economy vulnerable to climate variability, offers an essential context for the study, as organisations within it operate under complex institutional frameworks characterised by uncertainty, economic challenges, and heightened stakeholder expectations for environmental responsibility. These dynamics call for flexible, context-sensitive accounting processes that enable resilience and the creation of long-term value for an organisation. It is therefore crucial to understand how businesses respond to these challenges through EMA adoption, both in theory and in practice.

This study adopted an inductive research approach, grounded in a qualitative interpretivist research philosophy, to explore how actors within organisations comprehend and integrate climate threats into EMA practices. The study aimed to understand how the evolving function of EMA, as explored through individuals' lived experiences, organisational processes, and contextual realities, could be associated with sustainable value creation. This study contributes to the sustainability

accounting literature by offering empirically grounded, contextually rich evidence from an underexplored, resource-constrained developing economy.

2. Literature Review

Research on incorporating climate risk into EMA reveals several essential themes. Among these themes is Institutional Theory, which explains how external pressures, such as regulations, stakeholder pressures, and norms, and internal pressures collectively drive organisations to adopt and implement EMA-climate methodologies [6, 7]. Research studies have demonstrated that EMA techniques such as material flow cost accounting (MFCA), life cycle cost accounting (LCCA), and activity-based costing (ABC) generate both physical and monetary information that can make environmental costs visible, thereby supporting efficiency improvements [4, 8]. Nevertheless, the integration of many EMA practices or climate risk metrics remains predominantly theoretical [9]. In a study conducted by [10], a significant gap was found in the discussion of integrating EMA practices across an organisation in a developing economy, attributed to limited resources, a weak regulatory framework, political instability, and poor institutional capacity. Comparable studies from resource-constrained and developing economies show that only a limited number of large enterprises have adopted EMA-climate methodologies, driven by investor pressure, while most firms have not implemented them due to a lack of government support for EMA initiatives [5, 7, 11]. This is despite empirical evidence from developed economies on Environmental, Social and Governance (ESG) that integrating EMA and carbon accounting can enhance a firm's sustainability outcomes and sustainable value creation when profitability is integrated with sustainability [3, 5, 12]. Ultimately, this review identifies a gap: empirical and interpretive information is needed on how firms from emerging economies integrate climate risks into EMA methodologies and align these methodologies with local institutional demands to achieve sustainable value creation. Due to this gap, and from a qualitative perspective, the researchers argue that an inductive qualitative approach utilising in-depth interviews is needed to establish how actors make sense of climate risks and EMA in practice from a developing economy. This study will employ a qualitative research design and institutional theory to close this identified research gap.

2.1 Institutional Drivers and Pressures

Institutional theory is widely employed to explain the adoption of EMA and, subsequently, the incorporation of climate risk. From this perspective, coercive forces (regulations, enforcement) and normative pressures (industry norms, professional standards) encourage firms to implement environmental practices, while mimetic pressures also play a key role. A study conducted in Pakistan by [13] demonstrated that all types of institutional forces had a significant positive influence on the adoption of EMA. A similar study by [6] showed that institutional pressures drive firms to implement EMA initiatives, with EMA, in turn, acting as a vehicle that mediates improvements in Chinese firms' performance. These findings underscore that under strong regulatory pressure or stakeholder demand, firms are more inclined to integrate environmental metrics into management accounting.

[10] assert that various players, both internal (employees) and external (regulators, the media, and non-governmental organisations (NGOs)), can play an essential role in the adoption and implementation of EMA. The authors argue that employees and the media play key roles: they can influence organisations to adopt sustainable business practices by serving as surrogates for EMA

implementation, while NGOs also help disseminate these practices among organisations. Ultimately, this underscores the argument that exerting institutional pressures can compel organisations to integrate climate and environmental issues into their management accounting practices. While Institutional Theory explains why organisations face pressure to adopt practices, it provides less insight into how organisational actors interpret and respond to these pressures. To address this limitation, the present study incorporates a sensemaking perspective. Sensemaking refers to the process through which individuals interpret, assign meaning to, and respond to organisational and environmental events. In the context of climate risk integration, managers do not respond mechanically to institutional pressures; rather, they actively interpret the significance of climate-related expectations and decide how to reflect them in EMA practices. Consequently, sensemaking is conceptualised in this study as the mechanism through which institutional pressures are translated into organisational action.

While Institutional Theory explains why organisations adopt sustainability-related practices, it does not necessarily explain whether these practices become embedded in everyday organisational activities. The concept of decoupling provides an important complementary perspective. Decoupling occurs when organisations formally adopt policies, structures, or reporting practices to gain legitimacy while operational practices remain largely unchanged. In sustainability accounting contexts, organisations may publicly demonstrate commitment to climate risk management and environmental accountability without fully integrating these considerations into decision-making processes. Consequently, decoupling offers a useful lens for understanding the gap that may emerge between symbolic sustainability commitments and substantive organisational change. Available evidence indicates that resource-constrained and developing economies suffer from weak regulatory enforcement, hindering the adoption and implementation of EMA practices. An example is a study by [14] in Libya, which found that institutional barriers, such as weak coercive pressure and managerial attitudes, were the chief obstacles to EMA adoption within the manufacturing industry. A similar study by [15] indicates a lack of legislative support and budget allocation for sustainability initiatives in Zimbabwe, hindering many organisations from adopting EMA methodologies. Empirical evidence from other resource-constrained and emerging economies motivated this study, which aimed to explore how Zimbabwean organisations were integrating climate risks into EMA methodologies and aligning these methodologies with institutional demands.

[16] argue that contemporary organisations increasingly adopt formal structures and practices in response to institutional expectations, even when these practices have limited influence on operational activities. Similarly, sustainability reporting studies have shown that environmental disclosures may serve legitimacy objectives while failing to transform organisational behaviour [17]. These insights are particularly relevant in emerging economies where institutional pressures, resource constraints, and implementation challenges may create a disconnect between sustainability commitments and actual organisational practices. Consequently, examining whether climate risk integration within EMA reflects substantive organisational change or merely symbolic compliance represents an important gap in the existing literature.

2.2 Environmental Management Accounting Practices

EMA encompasses a variety of practices that account for environmental costs and resource movements, integrating physical measures (e.g., waste volume or energy consumed) with monetary

measures (e.g., associated costs). [18] highlighted that EMA employs a variety of methodologies to assess the flow of materials (physical units) as well as money (monetary units), and these include MFCA, LCC, and ABC. This dual focus (physical and monetary) has been observed as a strength of EMA: tracing physical flows enables firms to identify wasteful processes, and assigning monetary values to activities enables managers to view the costs incurred in financial decision-making. In a Zimbabwean mining case study conducted by [15], it was shown that tracking material and energy flows enabled managers to identify hidden waste costs and inefficiencies, and that MFCA improved eco-efficiency by highlighting non-value-adding activities. The integration of MFCA and LCC has been shown to elucidate wider economic, social, and environmental dimensions of investment initiatives [10]. Evidence from these empirical studies indicates that, in addition to assisting with compliance, EMA practices also provide information used in product costing and design. Most studies have examined EMA tools separately without integrating them [10, 19, 20], which motivated this study to focus on the integration process by linking climate risk assessment and existing EMA practices.

2.3 Climate Risk Awareness and Assessment

The emergence of climate risk has introduced a new level of uncertainty into management accounting. Although international reporting frameworks like the Task Force on Climate-related Disclosures (TCFD) recommendations and IFRS S1/S2 are pushing companies to assess climate-related risks and opportunities, few accounting studies have examined how these are incorporated into internal accounting systems [21, 22]. Studies in developing and developed economies show that, despite many organisations becoming aware of climate risk, very few have taken steps to address the crisis. Despite South Africa having a mandatory regulatory framework and disclosure driven by coercive institutional pressures, [23] found that carbon accounting methods remained uneven and symbolic among organisations and were not integrated into core financial decision-making. Another study by [24] in Nigeria found that climate-related practices were underdeveloped, primarily compliance-driven, lacked standardisation, featured selective disclosures, and were not linked to quantifiable financial risks, a situation exacerbated by a weak coercive enforcement framework. Therefore, these findings show that disclosures are mostly reactive rather than part of a systematic risk management framework. However, firms recognise climate risk, suggesting that evaluation tools within organisations are in their infancy. Consequently, there is a gap in the literature on how organisational actors perceive and interpret climate risk in relation to accounting information, which this interpretivist study explores to understand how actors perceive climate risk and how they integrate it into their management accounting systems.

2.4 Integration Processes and Organisational Response

Although empirical studies on how climate risk and EMA are integrated are scarce, the few available ones offer a sense of direction and a starting point. However, wherever EMA has been used, it has been embedded in larger environmental projects. A Zimbabwean study by [15] found that the adoption and implementation of EMA were essential, as they aided firms' objectives of cost control and risk reduction, and that EMA tools, aligned with material and energy flows, enhanced detailed tracking of by-product costs. This implies that if waste costs are made visible, managers can make informed, targeted decisions to address sustainability issues. This study proposes that integrating climate risk requires identifying emission sources within the operations and assigning

them monetary values. This proposition is supported by [10], who advocate a conceptual environmental management accounting practice (EMAP) framework which could accommodate climate factors to monitor both material and monetary flows, to mitigate environmental impacts and enhance firms' competitiveness. In a study conducted by [25], which traces carbon value flows through each production process and assigns monetary values, identifies processes that generate the most carbon and cost, and reports that optimising these flows resulted in significant cost savings for the company. The carbon value flow analysis (CVFA) in this study is essential because it converts carbon (physical flow) into a cost driver, enabling the identification of carbon emissions by examining the carbon value associated with that flow. The evidence from studies demonstrates that EMA can be integrated with climate risk by incorporating it into MFCA and treating carbon emissions as an environmental cost, thereby requiring monitoring to achieve sustainable value creation. Having MFCA within the integration is essential because it provides useful information on the physical and monetary aspects of manufacturing, enabling identification of leakages and carbon emissions. Having this information is key for organisations, as they can use it to develop mitigatory strategies to reduce waste by using materials more efficiently [8]. Researchers have argued that adding carbon management accounting could provide the essential information needed to address the bewildering challenges of sustainable development. Despite these recommendations, the practical methods for connecting climate data to management accounting have received little research attention. This is the gap motivating our study: to determine, through an inductively interpretivist approach and using in-depth interviews, whether Zimbabwean companies have established internal processes to incorporate climate risk into EMA. In this regard, institutional theory holds that these processes mirror prevailing pressures; for instance, if normative pressure originates from industry associations, integration will need to be facilitated through standardised reporting guidelines; conversely, if mimetic pressure arises from competitors' innovations, it may be achieved through benchmarking initiatives.

2.5 Barriers, Challenges, Organisational Influences and Actors

There are a variety of obstacles to EMA and related climate accounting in emerging economies, including a lack of awareness, technical expertise, and financial resources, as well as inadequate data and managerial commitment to EMA methodologies. Institutional barriers, including weak regulatory enforcement and a lack of official standards, constitute the greatest obstacle to Libyan manufacturing firms adopting EMA, leading to low EMA adoption rates due to unclear requirements and incentives [14]. Coupled with political and economic instability in Zimbabwe, it was noted that the government was doing nothing and that a weak regulatory framework governing environmental accounting was the chief obstacle to EMA adoption, as mining companies lacked motivation to follow the available minimum policies and were focused on survival [15]. These results align with the study by [1], which found that, in addition to management and information challenges, fragmented coordination and limited capacity make it difficult to integrate carbon accounting. Besides management attitudes that have acted as barriers to the adoption and implementation of EMA technologies, in which they regard sustainability issues as secondary to profit maximisation, studies have also found that the same managers may lack the practical knowledge required to adopt and implement EMA technologies [26]. Additionally, cultural attitudes, such as the perception that environmental stewardship is not a primary objective of businesses, have been recognised as

barriers to the adoption and implementation of EMA methodologies [27]. This study explored the most critical barriers to EMA-climate adoption in Zimbabwe, a resource-constrained emerging economy, and stakeholders' perceptions of these barriers.

In addition to barriers, various organisational factors influence EMA adoption and implementation, including company size, industry, and executives' commitment. For example, [6] shows that larger and more progressive firms were more responsive to environmental initiatives under institutional pressures. Similarly, researchers have found that major mining companies in Zimbabwe have stronger environmental practices than smaller ones [28]. In a qualitative study, the role of actors is crucial; researchers interviewed environmental officers, executives, and community leaders, thereby demonstrating that the adoption of EMA involves many groups [15, 17, 18]. This aspect of the literature review underscores the argument that, alongside institutional theory, which holds that value creation arises from balancing the interests of different institutional forces, sustainability initiatives are shaped by both internal and external stakeholders within an organisation, each playing an essential role [10]. Studies do not prescribe a single perspective on adoption and environmental management, as some emphasise top management commitment as key. In contrast, others identify ground-level sustainability champions as the drivers of EMA initiatives. In this study, we will explore how different actors make sense of climate concerns within their roles, aligning with the interpretivist research philosophy [29].

2.6 Sustainable Value Creation

The primary objective of EMA and climate accounting is to generate long-term value by achieving profitability whilst safeguarding social and environmental capital. Comprehensive sustainability accounting frameworks, such as ESG and triple bottom line, position environmental costs as key to long-term profitability. [3] argue that ESG measurement, encompassing environmental accounting data, is a crucial indicator of a firm's commitment to sustainable value creation. The authors went further, arguing that integrating EMA and carbon emissions is essential to enhancing firms' ESG performance, thereby effectively linking sustainability goals to performance. In a study of the Bangladeshi manufacturing sector, the EMA methodologies found to facilitate alignment between economic and environmental objectives included eco-efficiency and lifecycle analysis [9]. The findings from these studies show that resource efficiency and stakeholder trust and confidence in the organisation can be enhanced by integrating climate considerations into EMA practices. In this study, this will be demonstrated through in-depth interviews to determine whether managers view EMA and climate initiatives as strategic investments in reputation and resilience, or merely as compliance costs.

2.7 Conceptual Framework

Based on the foregoing, the study's conceptual framework connects institutional pressures, managerial sensemaking (Figure 1), EMA processes, and the creation of long-term value. The institutional theory asserts that institutional coercive, normative, and mimetic pressures dictate an organisational focus on climate risk, thereby affecting managerial interpretation and evaluation. Those interpretations determine whether and how climate factors in the EMA process can be divided into monetary and non-monetary groups. The inclusion of managerial sensemaking within the framework is particularly important because organisations exposed to similar institutional

pressures may respond differently depending on how organisational actors interpret climate-related challenges and opportunities. The framework, therefore, proposes that institutional pressures alone are insufficient to explain variations in climate risk integration. Instead, the depth and quality of Environmental Management Accounting implementation are shaped by the meanings organisational actors attach to climate risk and sustainability initiatives. Effective integration, consequently, enhances decision-making that harmonises environmental and economic objectives, thereby fostering sustainable value generation by integrating the company's strategy with overarching sustainability objectives. In this study, we will explore the role of institutional and normative expectations on the implementation of the EMA methodology for evaluating climate-related projects and how this may lead to increased efficiency, innovation, or value creation. In this regard, alongside institutional theory, the framework integrates the institutional context, actors' interpretations, and accounting practices by internalising external pressures within organisational fields.

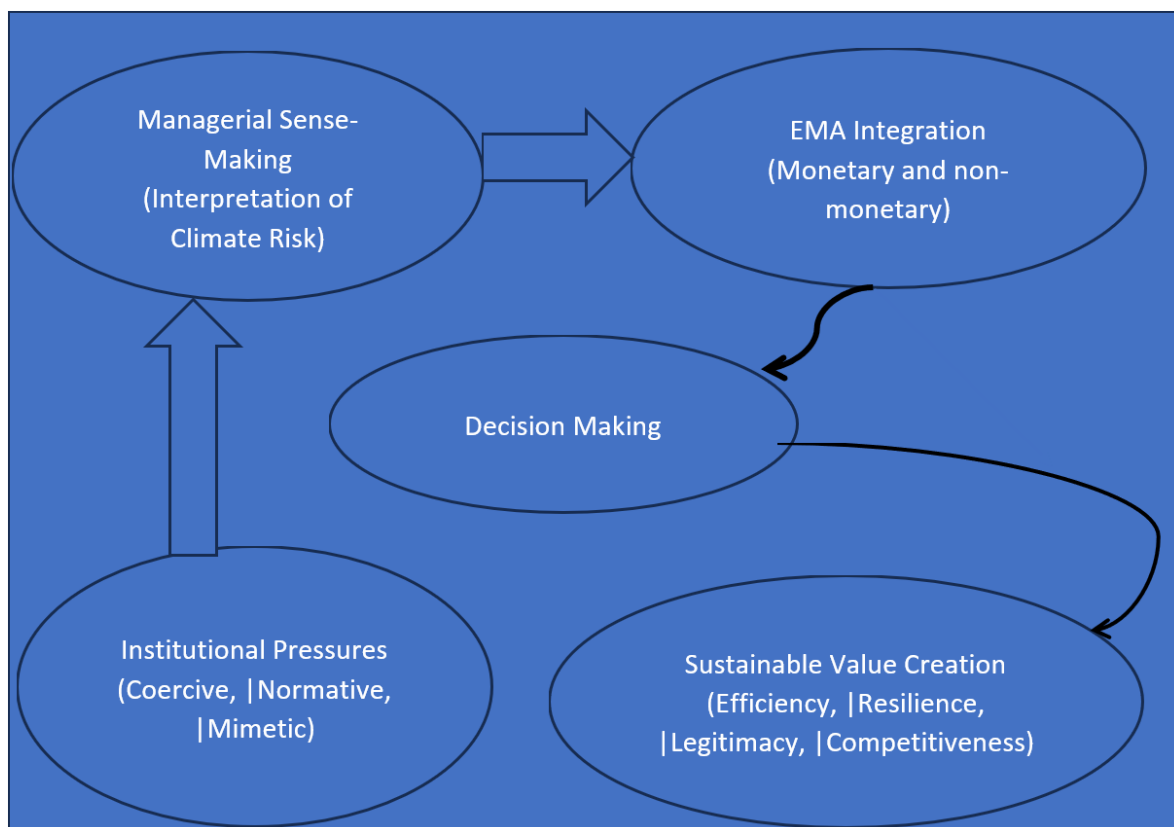


Figure 1 Conceptual Framework for EMA-Climate Integration.

2.8 Theoretical and Practical Contributions

This study made several contributions to the body of knowledge. Applying an inductive research approach, couched within an interpretivist research philosophy and an institutional perspective, to EMA and climate risk in Zimbabwe, the study contributed to the expansion of institutional theory into a novel realm. In addition, there are few empirical studies examining how enterprises in developing countries integrate climate risk into management accounting; hence, this study addressed this deficiency and contributed to the sustainability literature. Using in-depth interviews, this study explored insights into sensemaking among actors in a developing economy as they

interpret climate risk and integrate it into management accounting systems, ultimately enhancing the predominantly quantitative EMA literature. The findings of this study will provide a base and direction to managers and policymakers. By identifying key obstacles and facilitators to EMA adoption in Zimbabwe, targeted solutions are proposed, such as stakeholder engagement, intended to promote EMA and climate integration. The conceptual framework and empirical findings are hoped to assist managers in comprehending the advantages of EMA for resilience and compliance, while aiding regulators in formulating incentives that align with climate disclosure guidelines. This study contributes to a context-sensitive framework for EMA-climate integration and outlines strategies for firms in emerging economies to achieve sustainable value creation amidst climate uncertainty.

3. Materials and Methods

This study was grounded in an interpretivist research philosophy and sought to explore how organisational actors in Zimbabwe made sense of climate risk in their accounting practices [29, 30]. Based on the adopted philosophy, the study posits that meanings are socially constructed; therefore, we employed an inductive research approach to allow themes to emerge from the data. The study adopted a qualitative case study strategy [31] to explore how organisations across different sectors perceive and integrate climate risk into their EMA practices. Rather than examining a predefined set of organisations as distinct cases, the study focused on gathering rich insights from participants occupying key roles across multiple organisational contexts. This approach enabled an in-depth exploration of experiences, interpretations, and organisational responses to climate-related challenges within the Zimbabwean context. Although participants were drawn from organisations operating in different sectors, the study did not treat individual organisations as separate analytical cases. Instead, participants collectively contributed to an understanding of the broader phenomenon of climate risk integration within EMA practices. Consequently, the study is better characterised as a qualitative cross-sectoral case study rather than a multiple-case study. The study adopted a cross-sectional time horizon, enabling us to collect data at a single point in time and aligning with an inductive interpretivist research philosophy. The qualitative research design employed in the study enabled us to understand how selected actors understood and interpreted the subject matter, aspects that quantitative studies could not address [32].

The study adopted a purposive sampling technique to identify key actors with experience, responsibilities, and expertise that matched the subject matter under discussion. In line with a previous study by [15], management accountants, operational managers, chief financial officers, environmental officers, regulatory representatives, and NGO representatives were selected to participate in this study. Purposive sampling was adopted because the study sought participants with direct knowledge and experience of EMA practices, sustainability initiatives, climate risk management, and organisational decision-making processes. The objective was not statistical representativeness but the generation of rich, contextually grounded insights capable of addressing the research questions. Participants were therefore selected based on their professional roles and involvement in environmental, accounting, operational, and regulatory activities. The inclusion of participants from different sectors enhanced the diversity of perspectives and enabled the exploration of similarities and differences in organisational responses to climate risk integration.

Participants were selected from sectors particularly exposed to environmental pressures, resource-consumption challenges, sustainability reporting expectations, and climate-related operational risks. These sectors included manufacturing, mining, construction, non-governmental organisations, and government institutions. The selection of these sectors was informed by their varying levels of environmental impact, regulatory exposure, and sustainability engagement, making them suitable contexts for exploring how climate risk is integrated into EMA practices. Including participants from diverse sectors enabled the study to capture a broad range of organisational experiences and perspectives regarding climate-related decision-making. The objective of participant selection was not to achieve representativeness across all organisational types in Zimbabwe, but rather to obtain information-rich perspectives from sectors where climate risk and environmental accountability are particularly relevant. Consistent with interpretivist qualitative research, the study prioritised depth of understanding over breadth of coverage.

The principle of information richness guided the selection of participants. Individuals occupying positions in sustainability management, accounting, finance, operations, and regulation were considered particularly well placed to provide detailed insights into the organisational processes through which climate risks are identified, interpreted, and incorporated into decision-making. The diversity of participant roles strengthened the study's ability to explore the phenomenon from multiple organisational perspectives.

Even though we had planned to recruit 15 participants for this study, the process was stopped after interviewing participant 11, as no new information emerged from the interviews. To ensure that the study is genuine and reliable, and that the phenomenon under consideration has been adequately explored, qualitative studies require achieving data saturation, which occurs when no new information, insights, or themes emerge during data collection and thematic analysis [33]. When conducting qualitative studies, the sample size must be small, enabling in-depth interviews and facilitating a detailed understanding of the matter under consideration [30]. Data collection continued until theoretical saturation was achieved. Saturation was assessed through ongoing analysis during the interview process, where emerging themes were continuously compared across participants. By the tenth interview, no substantially new themes, concepts, or explanations were emerging. An additional interview was conducted to confirm saturation, but it reinforced existing themes rather than generating new insights. This indicated that sufficient depth and breadth of understanding had been obtained to address the study objectives.

The data used in this study were primarily collected through in-depth interviews, each audio-recorded and subsequently transcribed, and lasting roughly 45 to 60 minutes. Before conducting the interviews, the interview guide was piloted with two practitioners, and the results were used to refine it. Researchers had to explain the study's objectives and participants' right to withdraw without penalty and then provide a consent form for participants to sign before participating. Data collected from the in-depth interviews were analysed using thematic analysis [33]. Audio-recorded interviews were transcribed, and data were inductively coded, with initial codes describing how actors described climate risks, costs, and EMA processes. We used a manual coding system and grouped codes into themes that reflected patterns of meaning. Using thematic analysis, we repeatedly read transcripts and compared them with other transcripts to refine codes and themes [34].

To ensure the credibility of the study findings, several strategies were employed, including sharing transcript summaries with participants to check whether they reflected what would have

transpired during interviews. We also used multiple case studies to triangulate findings across cases and maintained a detailed audit trail of decisions made at every stage of the process. The researcher engaged in reflexivity by documenting any biases in field notes and communicating their interpretations to the co-author. Dependability was bolstered by clear documentation of the study's methodologies, while confirmability was enhanced by linking the findings to direct participant quotes.

The ethical considerations included voluntary participation in the study and the ability to withdraw at any time without penalty. Participants had to provide written informed consent before taking part in the study. Interviews were anonymised, with names and identifying details removed, and quotes were coded generically. Data were stored securely in a password-protected file only accessible to researchers.

Inter-case triangulation was employed to enhance the credibility of the findings. Participants were drawn from different organisational contexts and sectors, allowing themes emerging from one case to be compared with evidence from other cases. This process enabled the identification of recurring patterns, points of convergence, and areas of divergence regarding climate risk integration and EMA practices. The consistency of key themes across multiple organisational settings strengthened confidence in the robustness of the findings.

3.1 Theoretical Development

The institutional theory propounded by [35] underpins the study. The inductive interpretivist research adopted for the study shows how laws, industry standards, and peer pressure influence individuals' understanding of climate accounting. We let institutional elements emerge from the data through inductive coding, linking themes to the relevant pillars of institutional theory. For example, a theme on regulatory influence was linked to corporate pressures, and the objective was to develop a theory and a new understanding of how the EMA evolved, whilst responding to different challenges and creating long-term value. Theory building was facilitated by collecting comprehensive qualitative data through in-depth interviews, followed by comparison with the institutional framework during thematic analysis.

3.2 Justification for a Qualitative Perspective and Methodology Adoption

Most research on EMA has been quantitative, such as surveys that test drivers of adoption, but scholars are increasingly calling for qualitative studies to reveal how and why practices unfold. The inductive research approach and interpretivist research philosophy acknowledge that accounting systems and interpretations of climate risk are socially constructed. In their study [15], the authors employed interviews and thematic analysis to demonstrate how managers used EMA, and their reflexive research revealed subtleties that a quantitative study could not uncover. [30] argue that qualitative research methods enable researchers to explore actors' sensemaking and the contextual factors that shape it. In this regard, a case study design is well-suited because it enables an in-depth understanding of the subject matter and an examination of the context of the complex integration process within real organisations [31]. The choice of a cross-sectional approach for this study, rather than a longitudinal one, is supported by its exploratory nature, as the aim is to capture a "snapshot" of practices and attitudes at this time, recognising that climate accounting is evolving. Using in-depth interviews, the study allowed actors to explain their understanding of climate risk, describe

their accounting practices in detail, and suggest improvements. The qualitative study strategy employed in this study entailed understanding the EMA-climate integration methodology, how stakeholders' pressures shape its adoption, and how it must be incorporated into strategic decision-making processes.

4. Results

The findings of this study show that Zimbabwean firms acknowledge climate risk to varying degrees, with some having begun adopting EMA practices in response to institutional pressures. Participants in this study, including CFOs, management accountants, sustainability and operations managers, and regulators, described how they had shaped their management accounting systems in response to macro-level factors such as government policy and investors' expectations. The key themes that emerged during thematic analysis include climate risk awareness, EMA practices and integration, barriers to implementation, institutional influences, and sustainable value creation. Though often superficially, it was found that climate risks are increasingly being integrated into decision-making processes, and that both the physical and monetary environmental costs are being more closely monitored. Direct quotes from participants illustrate how they perceive the climate-EMA integration as reflecting coercive, normative, and mimetic pressures that influence organisational practice.

4.1 Participant Background and Role

The 11 participants in this study came from diverse backgrounds (Table 1), including mining, manufacturing, construction, NGOs, and government: three from management accounting, two chief financial officers, two sustainability managers, two operations managers, and two regulatory officers, with the majority having 5 to 15 years of work experience. Most participants frequently mentioned cross-disciplinary responsibilities, underscoring the challenge of integrating climate risks into existing management accounting systems. Their composition, however, enabled the study to capture perspectives at both strategic and operational levels, aligning with [15]'s position that EMA studies must include both internal and external stakeholders.

Table 1 Participants' Background and Role.

Participant	Sector	Gender	Working Experience	Role
P1	Manufacturing	Female	+6 years	Operations Manager
P2	Mining	Male	+8 years	Management Accountant
P3	NGO	Female	+5 years	Environmental Officer
P4	Manufacturing	Male	+6 years	Chief Financial Officer
P5	Construction	Male	+10 years	Management Accountant
P6	NGO	Male	+7 years	Environmental Officer
P7	Ministry of Mines	Female	+5 years	Regulatory Enforcer
P8	Mining	Female	+12 years	Management Accountant
P9	Construction	Male	+10 years	Operations Manager
P10	Mining	Male	+7 years	Chief Financial Officer
P11	Ministry of Mines	Male	+11 years	Regulatory Enforcer

4.2 Climate Risk Awareness and Assessment

Although the urgency varied among the actors, all participants (P1-P11) acknowledged climate risk as an escalating concern that is no longer possible to ignoreable. Most participants indicated that they were driven by institutional pressures to adopt EMA and had begun to view climate risk from a strategic perspective. To reinforce this point, P4 said:

“We have been forced to consider climate risk by investors and financial institutions, who have made it a policy to demand it whenever we want to borrow.”

Several respondents (P2, P3, P4, P5, P7, P10, P11) indicated that they subscribed to international standards, which provided guidelines for adopting EMA, as there is no local regulation to guide its adoption, thereby highlighting the importance of sustainability frameworks. In response to stakeholder pressures, several organisations in Zimbabwe appear to have voluntarily adopted climate-related information and disclosure practices. Participants suggest that normative and mimetic influences primarily shape recognition of climate risk in Zimbabwe, as organisations adhere to global standards to maintain legitimacy, given the absence of stringent, mandatory regulatory requirements. One respondent (P8) remarked:

“There are no local EMA guidelines that have been prepared by the government. Because we operate in the global village and our investors are foreigners, we must follow DRI standards and IFRS sustainability guidelines.”

On the contrary, a few participants (P1, P9) viewed climate risk as abstract and unrelated to their direct duties and thus prioritised the long-term success of an enterprise over ecological concerns. They viewed climate-related challenges through the lens of power outages or supply chain interruptions, rather than as a systematically integrated strategic risk. Participants demonstrated a disconnect between strategic sustainability dialogues and routine operational practices, with climate risk insufficiently integrated into decision-making. Even though many of the participants showed an awareness of climate risk, this, however, did not lead to systematic climate risk evaluation in many organisations, as demonstrated by the participants who indicated that they were still trying to understand how to calculate a carbon footprint and were in their initial pilot studies of trying to understand the concept.

4.3 Environmental Management Accounting Practices

Many of the respondents (P2, P3, P4, P5, P8, P10, P11) pointed to an expanding array of EMA techniques, signifying a progression from traditional accounting methods to a sustainability-focused reporting system. Environmental cost accounting and internal carbon pricing were the two financial metrics identified as used by many corporations in Zimbabwe to quantify environmental harm and its associated risks. The management accountants (P2, P5, P8) involved in this study indicated that they have been utilising the internal shadow carbon price in investment assessments, which has assisted them in forecasting future regulatory expenses and integrating climate issues into capital investment decisions. This method is crucial, as it can enhance cost transparency by fostering proactive, risk-adjusted decision-making, signalling a transition from traditional reactive compliance to a modern, proactive climate-risk sustainability management approach. One participant (P2) stated:

“It has become policy and standard practice for us to apply a \$30 per ton carbon charge in our proposed investment model to reflect the potential future taxes.”

This study found that assigning a theoretical price to carbon emissions could help organisations model the financial implications of carbon taxes, thereby improving the rigour of capital project appraisal. Participants assumed that performing this task would help management evaluate projects using financial and sustainability metrics, thereby facilitating the shift towards lower-carbon alternatives, which in turn could improve an organisation’s image through enhanced sustainability performance. To capture and account for waste and emissions control as distinct costs rather than aggregating them into overhead, several participants (P2, P3, P4, P5, P8, P10, P11) indicated that they had added an environmental cost ledger to their accounting system. Most participants noted that segregating environmental costs from overhead costs enabled management to visualise environmental expenditure, which, in turn, was key to formulating sustainability policies to improve operational efficiency. On the non-monetary side, organisations often monitored the flow of materials and energy by recording physical inputs and outputs, including material, energy, and water usage. These physical measures complemented monetary data, providing a holistic picture of the organisation’s environmental performance and, in turn, helping management make better operational and strategic decisions. One participant (10) from a mining environment remarked:

“Our venture is capital-intensive, and we do measure tonnes of the ore we would have processed, energy consumed and amount of water that would have been consumed, which aspects are converted into monetary terms and then linked to financial reports.”

Among the EMA techniques employed, LCC emerged as the most prominent tool in the construction and mining industries, primarily for evaluating investment projects. Although ABC and MFCA were also used, they were less common than LCC, suggesting that EMA practices are evolving from a traditional approach towards greater incorporation of sustainability issues, indicating a transition towards sustainability accounting.

4.4 Integration of Climate Risk into the Accounting Process

Most of the participants (P2, P3, P4, P5, P7, P10, P11) indicated that climate risks are increasingly integrated into management systems, reflecting an evolution from marginalisation to embedding in sustainability reporting and being considered strategic. Strategic plans in many organisations now mention climate risks, and funds are being set aside during budget allocation for investment in climate resilience initiatives, such as renewable energy installations, reflecting a growing recognition that climate risks have both financial and operational implications that must be proactively managed. One regulatory manager indicated that EMA adoption is not just symbolic but reflects a growing effort to align organisational strategy with sustainability goals, though the depth and consistency of this integration still lag in some organisations. To reinforce this discussion, participant (P3) had this to say:

“We felt there was no need for us to continuously resist change, and within our budget, we now include climate adaptation costs, in which we, for example, factor in cooling costs for a new plant due to high temperatures being experienced in the country.”

Those at the operational level indicated making practical changes, such as rescheduling maintenance tasks to avoid periods of bad weather, reallocating resources during high-risk seasons, and adjusting production schedules to account for climate change, thereby reflecting awareness of climate disruptions in their work. However, many participants (P1, P2, P3, P4, P5, P6, P8, P10) indicated that the integration of climate risks into EMA is still ad hoc and reactive, since there is no internal guiding framework, and the fact that most employees have not been capacitated on how this must be done. It was found that climate issues are most often addressed after a catastrophic event rather than embedded in standard operating procedures, highlighting the gap between awareness of a problem and its institutionalisation. One operations manager (P9) stated:

“To be frank, climate risk is distinct from my normal operations, and I don’t see how what I do is linked to climate change. Within our department, we have not integrated climate risk in our ERP, though as part of management, this is something we discuss in meetings.”

Participants generally described climate risk integration as an emerging organisational practice rather than a fully institutionalised process. References to climate-related investments, budget allocations, and operational adjustments suggest that some organisations have begun incorporating climate considerations into their management processes, although the extent of integration varies considerably.

4.5 Barriers, Challenges and Institutional Influences

Participants (P1-P11) concurred that there were major obstacles to the complete integration of EMA, with regulatory and institutional gaps identified as the greatest. One participant (11) from the regulatory environment remarked:

“When it comes to sustainability reporting, you need to know that this is a voluntary disclosure being done by companies, and there is no carbon tax or mandatory climate reporting, and management in most companies has no urgency in doing it.”

Participants suggested that there are no coercive pressures that would force businesses to make climate risk a regular part of their EMA processes. As a result, firms tend to focus on financial and operational performance rather than sustainability initiatives, leading to fragmented and inconsistent adoption of EMA practices. Weak enforcement makes firms dependent on external pressures, such as investor expectations, which ultimately shows how normative and mimetic pressures shape organisations’ responses.

The other critical barriers identified were a lack of financial resources and data. Most participants (P1, P2, P3, P4, P5, P7, P8, P10) indicated that implementing EMA requires a significant investment in technology and training. Most participants in this study indicated that, due to a lack of financial resources, EMA projects are being suspended in favour of company expenditures that are more likely to generate better financial returns. In addition, participants noted significant problems with the reliability, standardisation, and context-specificity of environmental data, especially when measuring and quantifying climate-related hazards, which make it challenging to translate physical climate hazards into meaningful accounting information. This is exacerbated by weak data-collection techniques and poor cross-departmental integration, which further constrain the organisation’s ability to embed climate considerations in EMA practices. One participant (P10):

“It is not that we don’t want to adopt EMA practices, but when you look at the economic challenges we are facing as a country, you can see that we don’t have financial resources to invest in them; our focus is survival in a turbulent environment.”

The other challenge pertained to managers’ attitudes toward climate risk initiatives: they felt they were secondary to profit generation, viewed sustainability initiatives as a cost, and therefore could not support them. This led to some climate-related projects being abandoned or implemented only when they were viewed as bringing financial benefits to the organisation, resulting in the organisation’s integration remaining constrained, as managers’ attitudes significantly shaped the extent to which these projects were institutionalised through practices and decision-making. One CFO (P4) remarked that:

“When you consider the economic challenges prevailing and the fact that there is no regulatory enforcement in Zimbabwe, it becomes difficult to convince the board to spend on climate-related issues.”

The other challenge was limited capacity to implement sustainability initiatives: participants indicated that only a few firms had dedicated sustainability staff, suggesting that this task was not assigned to anyone in many organisations, resulting in a lack of accountability for sustainability-related issues. Participants consistently indicated that limited organisational capacity and the absence of dedicated sustainability personnel constrained the implementation of EMA practices across many organisations.

Most participants’ (P1, P2, P3, P4, P5, P7, P8, P10) narratives indicated that all three pillars of institutional pressure were exerting varying degrees of pressure on organisations to adopt EMA. Although the Zimbabwean government has not enacted formal guidelines or regulatory mandates to compel organisations to implement EMA practices, most of the participants indicated that the availability of policies and government acts that talk about climate risk is enough evidence that the regulator is aware of climate risk, which puts pressure on proactive management to take action before the government comes with coercive enforcement in the near future. It was, however, noted that, according to participants’ narratives, the pressure exerted on businesses was merely rhetorical, with no enforcement mechanisms in place or means to punish those who fail to comply. The implication is that companies are operating in a context where climate-related regulations, formulated and in place, lack the institutional strength to drive change in practice. Due to weak regulatory enforcement, which reduced the urgency for businesses to integrate climate risk into their EMA practices, those that adopt choose a minimal-compliance or symbolic approach rather than full compliance. One participant (P7) from a regulatory environment remarked:

“We don’t have mandatory climate policies, and those that have adopted and are disclosing climate issues are doing so voluntarily. In this regard, we can only include climate costs in our budgets, considering all activities considered key and would result in tangible benefits to an organisation.”

Conversely, participants showed that industry standards and stakeholder expectations had a notable influence on how businesses viewed and addressed climate risk and sustainability practices in Zimbabwe. Several participants (P1, P2, P3, P4, P5, P8, P10) indicated that the pressure to adopt and integrate climate risk was from foreign investors, global consumers, and supply chain partners who made it essential for businesses to follow global trends, even though they were not mandated

to do so. Besides the need to meet international standards, normative pressures pushed businesses to embrace sustainability accounting to be more transparent, demonstrate a commitment to sustainability, remain competitive in the global village, and secure an international social licence to operate (legitimacy). Consequently, companies were more responsive to external stakeholder pressures than to domestic statutory mandates, underscoring the argument that normative pressures reinforce the integration of climate considerations into EMA practices. One manager (2) from a manufacturing environment remarked:

“Considering that we are operating in the global village, we have customers in many parts of the world, and some of these are from countries that require mandatory climate disclosures and are interested in finding out if we are doing the same before they can buy from us. We want our company to be seen as promoting the green African brand, and sustainability has become part of our culture.”

Participants suggested that the absence of strong regulatory enforcement and normative and mimetic pressures is the principal motivator for environmental adoption, which could explain why certain organisations become early adopters of climate risk integration into EMA practices, thereby bolstering legitimacy, reputation, and alignment with global best practices. These organisations typically aim to present themselves as leaders in sustainability to investors, business partners, and regulators. On the other hand, some organisations are left behind and adopt a more cautious, reactive approach because they lack financial resources and are not exposed to global pressures. This underscores why adoption rates vary and why we see disparities in institutional exposure, strategic direction, and in how organisations view the costs and benefits of adding climate-related practices to their core accounting practices.

4.6 Sustainable Value Creation, Future Improvements and Recommendations

Most of the participants (P1, P2, P3, P4, P5, P8, P10) consistently linked EMA and climate risk considerations to long-term value, demonstrating that they had moved from viewing sustainability as an abstract and meeting minimum requirements to a holistic approach of seeing it as a means of creating value to an organisation. Participants agreed that using resources more efficiently not only lowers emissions but also reduces business expenses, ultimately increasing the firm's value. Ultimately, this underscores the argument that using resources more efficiently will make the company more environmentally friendly and save money, thereby boosting its bottom line. Many participants argued that organisations are more resilient when they are more efficient, as they are less likely to be affected by price changes and operational problems. Therefore, EMA-enabled climate initiatives that were previously viewed as costs can now be seen as investments that can help businesses stay competitive, reduce risk, and enhance sustainable value creation. To reinforce this argument, two participants stated:

“Remember, we are operating under economic challenges, and whatever we do that results in us being able to save costs is welcome. We have been able to improve the efficiency of our operations by reducing material wastage, the amount of diesel we use in powering our plant during power cuts, and this has assisted in improving the value of our organisation during these hard times.” (P1)

“We decided to reduce our carbon footprint from diesel emissions by investing in solar energy, which paid off by lowering our electricity utility bill and ensuring us against power outages, which have become a common thing in Zimbabwe, and in the end, the value and resilience of the firm improved.” (P10)

Most participants prescribed several improvements, the most significant being the incorporation of climate effects into accounting systems. Several participants in this study emphasised the need for organisations to move from informal, ad hoc procedures to a systematic integration in which climate-related costs and performance metrics are incorporated into their budgeting and reporting processes. This calls for the creation of separate, distinct environmental cost centres, the implementation of a system to track and price carbon emissions, and the alignment of accounting systems with global sustainability standards. Most participants contended that formalising EMA-climate integration processes would enhance the consistency, comparability, and accountability of decision-making, thereby helping firms monitor climate-related issues and sustainability initiatives that affect their financial performance. Participants noted that such integration is essential for shifting the organisation from a reactive to a proactive mode of action, thereby making EMA an even more strategic tool for creating long-term organisational value. Regulatory suggestions from participants included introducing carbon pricing or tax breaks to encourage businesses to take a more structured, proactive approach to incorporating climate risk into EMA. In this regard, participants recommended developing clear guidelines, including a standardised carbon accounting system, strict disclosure standards, and financial incentives for sustainability initiatives, to push businesses to go beyond voluntary, inconsistent practices.

The findings presented above highlight how organisations perceive and respond to climate risk within Environmental Management Accounting practices. While the results reveal recurring themes related to awareness, integration, barriers, and value creation, they do not in themselves explain the broader theoretical significance of these patterns. The following discussion section interprets these findings in relation to Institutional Theory and the wider sustainability accounting literature.

5. Discussion

This study explored how organisations in Zimbabwe integrate climate risk into EMA and how this integration leads to sustainable value creation. The findings of this study are consistent with an inductive, interpretivist research approach and show that integration is uneven and context-based, and that although awareness of climate risk is high, formalisation in accounting systems is partial and often externally driven. Institutional theory was adopted as the analytical framework to elucidate how coercive, normative, and mimetic pressures influence the adoption and depth of EMA-climate integration, whilst simultaneously highlighting the role of managerial sensemaking in translating these pressures into practice.

5.1 Climate Risk Awareness and Organisational Sensemaking

The findings of this study show that climate risk awareness is most driven by external pressures, such as investors, global buyers, and international reporting standards, rather than by local standards. The aspect of this finding underscores the argument that normative and mimetic influences play an essential role in shaping EMA-climate disclosure in developing economies [36-

38]. From an institutional standpoint, it can be inferred that the dominance of normative influence stems from global pressures on an organisation, which force it to align to gain legitimacy, access international markets, and attract investment. This finding extends previous research by demonstrating that climate awareness is not uniform within organisations. The findings of this study demonstrate that senior management conceptualise climate risk strategically. In contrast, operations only consider it when they face a challenge that disrupts their work, such as power outages or supply chain disruptions. This heterogeneity among organisations, therefore, reflects an inductive interpretive process whereby individuals construct different meanings, leading to inconsistent integration of climate awareness into accounting systems.

The divergence between managerial and operational perspectives appears to reflect differences in organisational responsibilities, access to information, and decision-making horizons. Senior managers are typically exposed to external stakeholder expectations, sustainability reporting requirements, investor concerns, and long-term strategic planning processes. Consequently, they are more likely to frame climate risk as a strategic issue with implications for organisational resilience and competitiveness. In contrast, operational personnel tend to focus on immediate production targets, resource constraints, and day-to-day disruptions, resulting in a more reactive understanding of climate-related challenges. This sensemaking gap has important implications for EMA practices because it may limit the translation of strategic sustainability objectives into operational decision-making. As a result, climate risk integration may remain concentrated at the senior management level without fully embedding in organisational routines and accounting systems. These findings reinforce the interpretivist assumption that organisational actors construct different meanings around climate risk based on their experiences, responsibilities, and exposure to institutional influences [13]. The results further suggest that normative pressures associated with international sustainability standards shape how climate risk is understood and prioritised within organisations, thereby supporting the explanatory relevance of Institutional Theory. The observed differences between managerial and operational interpretations of climate risk suggest that climate-related knowledge is unevenly distributed across organisational levels. Rather than representing a simple awareness deficit, the findings indicate that organisational actors construct climate risk in line with their roles, responsibilities, and performance priorities. This helps explain why some organisations demonstrate awareness of climate-related challenges yet exhibit limited operational integration of EMA practices. The findings therefore suggest that successful climate risk integration requires not only technical accounting tools but also organisational mechanisms that align strategic sustainability objectives with operational practices.

This finding further highlights the importance of internal communication and organisational learning processes in sustainability transitions. Where climate risk remains concentrated within strategic or sustainability functions, opportunities for meaningful organisational change may be constrained. Conversely, organisations that facilitate the diffusion of climate-related knowledge across organisational levels are likely to be better positioned to embed EMA practices in everyday decision-making. The findings, which align with the literature, therefore suggest that climate risk integration is not solely a technical accounting challenge but also an organisational and behavioural process [39].

The findings also resonate strongly with the concept of decoupling. Although participants frequently described growing awareness of climate risk and increasing commitment to sustainability objectives, evidence of systematic integration into organisational routines and accounting systems

remained uneven. This suggests that, in some organisations, climate-related practices may function primarily as symbols of legitimacy rather than as deeply embedded management processes. Consistent with [16] conception of decoupling, formal commitments to sustainability may coexist with limited operational transformation. The findings, therefore, highlight the possibility that climate risk integration within Environmental Management Accounting remains partially decoupled from everyday organisational decision-making.

5.2 Evolution of EMA Practices: From Compliance to Strategic Tools

The findings of this study show that participants agreed that EMA was slowly increasing, starting with tracking materials and energy flows within organisations, and progressing towards sustainability accounting and internal (Shadow) carbon pricing. These approaches mirror established EMA techniques such as MFCA, LCC, and ABC and align with the literature, which suggests that physical and monetary information can be used jointly to make holistic decisions [40]. The incorporation of shadow carbon pricing into capital investment appraisal is crucial, as it helps internalise anticipated regulatory costs, thereby enhancing the resilience of investment choices. Nevertheless, the adoption of EMA remains fragmented, with some organisations having broken down environmental costs and added non-monetary indicators, while others still aggregate and treat them as overhead costs. Despite the absence of a local standard to guide the implementation of EMA methodologies, the findings indicate that EMA is in transition in developing countries, moving from its traditional compliance-focused reporting role to a strategic decision-support tool.

These findings align with [36], which hypothesise that EMA involves physical flows and financial expenditures, and are substantiated by [10], which claims that EMA techniques such as MFCA, LCC, and ABC help capture environmental waste for decision-making.

5.3 Integrating Climate Risk into EMA: Partial and Selective Institutionalisation

Although the implementation of the EMA-climate methodology remains sparse, there is some progress, as most organisations are aware of it and are making strides towards its adoption. The findings of the study shows that the seriousness given to climate risk is dependent with level one is within the organisation as those at management level now view climate risk using strategic lens and are now incorporating it in their budgets and also directing resources resilience investments and adaptable infrastructure, while those at operational level use the reactive approach in that they only think of climate risk when there is a problem that would have happened within their production lines which relates to climate change, and there is no integration of the concept into their operating procedures. This aligns with researchers who argue that Zimbabwe's weak regulatory enforcement environment creates a context in which sustainability initiatives are voluntary rather than mandatory [37]. This study endorses the idea of decoupling, which holds that most organisations adopting sustainability initiatives are not committed to sustainability but are only doing so to window-dress and appear good to meet legitimacy expectations. In the end, they will never fully integrate the concept into their business operations [41]. Due to a lack of coercive regulatory enforcement, it was found that the adoption and implementation of EMA-climate methodologies are selective, with implementation mostly practised where tangible financial benefits are evident.

5.4 Barrier to Integration: Institutional Voids, Resource Constraints, and Managerial Logics

Several barriers make it harder to fully incorporate climate risk into EMA processes. The study's greatest finding is the weak regulatory coercive pressures stemming from the absence of mandatory climate reporting, thereby reducing organisational urgency for its adoption and implementation. Further, it was noted that financial constraints and capability gaps were limiting investment in capable systems, data infrastructure, and specialist skills required to implement EMA technologies. There is also a lack of real data, which has hindered the translation of physical climate into reliable accounting systems. Managerial attitudes were found to be a critical barrier to the full integration of EMA and climate risk, as managers viewed sustainability initiatives as costs and prioritised profit over supporting them. Taken together, these barriers create a powerful hindrance that can prevent an organisation from fully adopting and implementing sustainability initiatives [3]. The findings of this study align with and validate previous studies and expand on them by showing how practitioners mitigate these barriers in real-world scenarios.

5.5 Institutional Pressures and Adoption Patterns

The results of this study support Institutional theory, as they show that coercive, normative, and mimetic pressures work together to compel organisations to adopt sustainability initiatives. Coercive pressure was minimal and largely rhetorical; normative pressures from global standard-setting bodies and investor expectations were stronger, while mimetic pressures also encouraged imitation of leading firms in the industry. This finding explains why there is variation in adoption rates: firms conducting business in foreign markets are early adopters, using EMA-climate integration to boost their legitimacy and competitiveness, while those focused on the local market take a more reactive approach. This aspect of the finding highlights how the relative strength of the institutional pillar shapes not only whether firms adopt EMA practices, but also the extent to which they must take sustainability issues into account in their practices [4].

5.6 Sustainable Value Creation: Reframing EMA as a Strategic Capability

A central insight is to view EMA and climate initiatives as ways to create long-term value rather than merely as compliance costs. Participants in this study associated resource efficiency with cost reduction, risk management, and resilience, thereby demonstrating an expanded understanding of value that encompasses financial, environmental, and strategic aspects arising from integration. The findings of this study support sustainable accounting research by linking environmental performance to competitiveness and thereby extending it, showing how managers in developing economies operationalise this link. When organizations internalize climate risks through carbon pricing and by making environmental costs more visible, they are better equipped to make future decisions and account for risks, thereby supporting long-term value creation.

This aspect of the finding demonstrates an expanded concept of value creation, thereby aligning with the sustainability accounting literature, which associates sustainability performance with competitiveness and organisational success. Increasingly, businesses are realising that profit maximisation isn't the only factor that matters for long-term success; they must also consider their environmental performance, manage risks, and build stakeholder trust.

5.7 Implication for Theory and Practice

Theoretically, the findings of this study expand Institutional Theory by demonstrating how institutional pressures influence not only the adoption but also the understanding and the depth of implementation, thereby highlighting the essence of actor sensemaking in sustainability accounting. In practice, the study's findings suggest that organisations need to formalise climate issues within their accounting systems, invest in data and capabilities, and align EMA with strategic objectives. The research findings imply that the government, as a key stakeholder in sustainability initiatives, must play its role by coming up with a coercive regulatory framework that may compel organisations to adopt and implement sustainability initiatives, and by also crafting enactments that incentivise organisations to view sustainability from a strategic lens, thereby lessening the need for symbolic activities driven by outside forces.

A key theoretical insight emerging from this study is that institutional pressures do not operate independently of human interpretation. Although organisations may face similar regulatory expectations, stakeholder demands, and industry norms, their responses vary because organisational actors construct different meanings of climate risk. The findings, therefore, suggest that managerial sensemaking functions as a mediating mechanism linking institutional pressures to EMA practices. This perspective helps explain why some organisations pursue substantive climate risk integration, while others adopt more symbolic or compliance-oriented approaches, despite operating in similar institutional environments.

Beyond demonstrating the relevance of coercive, normative, and mimetic pressures, this study extends Institutional Theory by showing that institutional pressures alone do not guarantee the substantive integration of climate risk into EMA practices. Rather, the findings reveal that organisational actors actively interpret, negotiate, and respond to institutional demands through managerial sensemaking processes. As a result, similar institutional pressures may yield different organisational responses depending on how climate-related issues are understood, prioritised, and translated into accounting practices. This study, therefore, advances Institutional Theory by introducing managerial sensemaking as an important explanatory mechanism linking institutional pressures to the depth and quality of climate risk integration within EMA systems. In doing so, it moves beyond conventional explanations that focus primarily on adoption and highlights the processes by which sustainability-oriented accounting practices become institutionalised in emerging-economy contexts.

6. Conclusions

This study, grounded in an inductive interpretivist research philosophy, explored how climate risk could be integrated into EMA practices in a resource-constrained emerging economy and how this integration could promote sustainable value creation. The study's findings show that most organisations are aware of climate risk. However, it has been partially and unevenly integrated into EMA and business practices, with those that have implemented it driven by external forces such as foreign markets and investors. It was found that some organisations have begun incorporating climate considerations into strategic planning and budgeting, and some have adopted EMA tools such as environmental cost accounting, material flow tracking, and internal carbon pricing. Although the study findings show that organisations have begun incorporating climate issues in their mission statements, it was identified that this has not been properly institutionalised. Integration in most

organisations is still reactive and ad hoc because there is no enactment compelling them to do so, coupled with a lack of financial resources and general organisational challenges. The findings of the study demonstrate that, without strong coercive regulatory enforcement, normative and mimetic pressures from global funders, global customers, and international standard-setting bodies become essential drivers compelling organisations to adopt and integrate climate risk into EMA practices. The study found that, despite barriers to EMA adoption and implementation, there is growing recognition that integrating climate risk into EMA can enhance an organisation's efficiency, resilience, and long-term competitiveness. Ultimately, this study concludes that EMA is evolving from a compliance-oriented practice to a strategic approach with the potential to enhance climate-responsive decision-making and sustainable value creation.

The study extends Institutional Theory by demonstrating that institutional pressures influence not only the adoption of EMA practices but also the interpretation and embedding of climate risk within organisational systems. The findings suggest that managerial sensemaking is a critical mechanism through which institutional pressures translate into accounting practices, thereby explaining variations in the depth of climate risk integration across organisations.

The study contributes to the sustainability accounting literature by demonstrating that climate risk integration is influenced not only by institutional pressures but also by the extent to which sustainability initiatives are substantively embedded in organisational practices. By highlighting the potential for decoupling between sustainability commitments and operational implementation, the study offers a more nuanced understanding of the adoption of Environmental Management Accounting in emerging-economy contexts.

As a limitation, the study uses an inductive interpretivist qualitative research design, which provides rich context-based insights but limits the generalisability of these findings beyond Zimbabwe. In addition, the study uses a cross-sectional time horizon, which captures practices at a single point in time and does not account for the integration of EMA and climate risk over time. Despite attempts to enhance reliability, the study relies on self-reported interview data, which may be subject to bias, including socially desirable responding. Even though this study included people from many different roles and fields, it examined only a small sample, which may not accurately reflect how different organisations operate. However, a small sample is typical of an in-depth qualitative inquiry.

Although participants were selected from multiple sectors, including mining, manufacturing, construction, government, and non-governmental organisations, the sample cannot fully capture the diversity of organisational contexts in Zimbabwe. Differences between large corporations and small- to medium-sized enterprises (SMEs), as well as between formal- and informal-sector organisations, may influence the adoption and integration of EMA practices in ways not fully reflected in this study. Consequently, the findings should be interpreted as contextually grounded insights rather than a comprehensive representation of all organisations operating in Zimbabwe. The value of the study lies in its analytical depth and theoretical contribution rather than statistical representativeness.

The study does not claim statistical representativeness of all organisations operating in Zimbabwe. Rather, participants were purposively selected because of their direct involvement in accounting, sustainability, operational, and regulatory activities relevant to the study objectives. The inclusion of participants from multiple sectors provided variation in organisational contexts and enabled the exploration of common patterns and differences in climate risk integration practices.

Consequently, the value of the findings lies in their analytical and contextual insights rather than their statistical generalisability. Future research could also address the representation gap identified in this study by undertaking comparative investigations across different organisational contexts. Comparative studies examining EMA and climate risk integration in SMEs and large organisations would provide valuable insights into how organisational size, resource availability, governance structures, and institutional pressures influence the adoption and implementation of climate-conscious accounting practices. Similar comparisons between formal and informal sector organisations could further enhance understanding of how different institutional environments shape Environmental Management Accounting practices within emerging economies. Future studies can build on this one by conducting longitudinal research to examine how EMA and climate risk integration evolve. In addition, it is crucial to conduct comparative analyses of resource-constrained developing economies to gain a deeper understanding of the subject matter's influence on the formulation of sustainability accounting methods. Future studies should also employ a mixed-methods research design, combining qualitative and quantitative approaches to assess the impact of EMA on organisational performance and sustainability outcomes. Future studies could broaden the range of stakeholders to include investors, financial institutions, and community representatives, thereby providing a more comprehensive understanding of the ecosystem influencing EMA adoption and sustainability practices.

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Competing Interests

The authors have declared that no competing interests exist.

Data Availability Statement

The data supporting the findings of this case study are not publicly available due to privacy and ethical restrictions that protect participant confidentiality. Transcripts and raw interview data may contain identifiable information and are therefore accessible only to the principal investigator upon reasonable request, provided that appropriate ethical clearance has been obtained.

AI-Assisted Technologies Statement

The authors declare that AI-assisted tools, namely QuillBot and Grammarly, were used solely for language editing, paraphrasing, and grammar correction. These tools did not contribute to the generation of research content, data analysis, or interpretation. The authors take full responsibility for the content and integrity of the manuscript.

Additional Materials

The following additional materials are uploaded at the page of this paper.

1. Interview Guide.

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